MAKING PEOPLE GOOD, DOWN TO THE LAST DROP:
TOWARD A GENEALOGY OF THE GOVERNMENT OF WATER

By

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ABSTRACT

The government of water is at a crossroads. During the second half of the past century, the flow of surface- and ground-water captured, consumed and used increased threefold. Recent efforts to align water governance with the realities of a resource whose finite abundance was constituted over the course of geological time have failed to inspire the allegiance of the public. Motivated by the history of modern government found in the work of Michel Foucault, this thesis questions the adequacy of the theoretical approaches employed in the analysis of this ontological and epistemological crisis of water in contemporary social science and humanities research. Through a review of the literature of social philosophy and theory on water, and a case study of the Qu'Appelle River, it is argued that a genealogical analysis can make an important contribution to our understanding of the complexity and contingency of the history of present water governance.

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Kurt Vonnegut is fond of reminding aspiring writers that, unlike music, words on a page are not mere 'ear candy' and should never be expected to satisfy much more than an embarrassingly small number of likeminded people with similar concerns. I should caution against taking the sardonic advice of such an under-appreciated American novelist too literally. This thesis was, however, written with one person in mind, and it would not have been possible without the inspiring intellect, professionalism and generosity of Alan Hunt.

I would also like to immediately thank Bruce Curtis, for joining this project at my request and modestly offering his scholarly expertise whenever required. The Department of Sociology and Anthropology at Carleton University offers graduate students a stimulating academic environment. While there is not the place to mention everyone by name here, I would like to thank professors Andrea Doucet, Pat O'Malley, and Aaron Doyle for offering thought provoking courses, reading my work with a keen eye, and always offering helpful suggestions. My thoughts would never find any semblance of coherence if I did not enlist the help of my fellow graduate students, Aimée Campeau, Jen Wrye, Christian Caron, Robyn Smith, Danny Braun, Chris Peters, Tamy Superle, and Gerald Morton.

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Chapter one: an introduction to the governance of water

If I had to write a book to communicate what I have already thought, I'd never have the courage to begin it. I write precisely because I don't know yet what to think about a subject that attracts my interest. In doing so, the book transforms me, changes what I think...In this sense I consider myself more an experimenter than a theorist; I don't develop deductive systems to apply uniformly in different fields of research...In my case it's another matter entirely: my books don't have this kind of value. They function as an invitation, as public gestures, for those who may want to eventually do the same thing, or something like it, or, in any case, who intend to slip into this kind of experience.

- Michel Foucault, 1978¹

I. The experience

This thesis was motivated by two obstructions, one intellectual and the other decidedly political, which made it utterly impossible for me to sustain what I had hitherto conceived to be the order of things. In the spring of 2003, an organization of Aboriginal peoples refused the provincial government access to a series of dams. They further threatened to dismantle and remove the dams if a measure of control and riparian rights were not granted over to the portion of the Qu'Appelle River that flowed through their reservations. My initial research into the history behind this event was motivated by the way in which this environmental conflict appeared to reflect the economic, social and racial tensions of the Canadian West more generally.

The theoretical and political critiques that guided my early research, however, failed to capture the experience or the dynamics of the struggle. When Marxist approaches were applied, I remained caught in the logic of the Enlightenment, self-realization and emancipation, to which only alternative routes could be proposed. Yet it was difficult to ignore the fact that the protagonists expressed less of a desire for development alternatives than they did a need for an alternative to development. From the other

¹ Foucault, Michel (1991) [1978]: 27, 39, 40.

direction a complex paradigm was emerging – a strange brew of postmodernism, post-structuralism, converted Marxist sociologists and natural scientists – drawing inspiration from a neo-Kantian branch of philosophy. Although, with its explicit yearning for a lost ‘organic relationship’ between the human and the natural, this paradigm seemed hopelessly romantic about the past as well as future prospects. I will substantiate these criticisms later. In the meantime it is important to note only that this journey led me to take up a peculiar and largely uncharted ‘theoretical’ position.

Employing the analytical tools of Michel Foucault, I propose to study the history of how people and water have been constituted as subjects and objects in order to be governed. Of course, Foucault rather deliberately had almost nothing to say about ‘nature,’ as such, unless working to undermine the idea of a natural body or sex in his later efforts. In that vein, the intention here is not to pose a series of research questions which can then be systematically and deductively answered according to a clearly articulated theoretical framework. Instead, the arguments and evidence presented on these pages are meant to stimulate a different ethos of inquiry – a novel mode of posing questions about the relationship between people and nature – which is far less concerned with uncovering a deeper truth about the water crisis or proposing ways in which it might be resolved.

Because the researching and writing of this piece was so profoundly shaped by the experience of the aforementioned refusals, this introductory chapter will begin with a lengthy discussion of their geographical and historical context, followed by a brief recounting of the actual events. After which I will sketch out the two dominate theoretical approaches to similar water problems, found in the social sciences and the

humanities, and the central dilemmas facing these perspectives. I will then explain the central argument put forward in this thesis, and what is meant by the phrase ‘water governance.’ Finally, the plan for the remaining chapters of the thesis is outlined.

II. Empire, capitalism, and canoes: the geographical imagination of the Canadian West

Imagining geography

A narrow strip of geography, strung from coast-to-coast within a days drive of the United States, is the space in which the vast majority of Canadians live out their everyday lives. The horizontal orientation of this space was constituted, of course, by coal and iron, railways and a ‘National Policy,’ and then reconstituted much later by oil and steel, asphalt and trade liberalization. That this was not always the case, that another *imaginative geography* lies deep in the recesses of its collective memory, is evidenced in the migratory patterns that can be observed during the sweltering, if brief, Canadian summers.

Imaginative geography is a concept borrowed here from the scholarship of Edward Said. His central argument is that the boundary taken to exist between the Occident and the Orient owes more to the people in the humanities, Eastern studies programs and social sciences charged with *re-presenting* the Orient, than it does to anything ‘out there’ in reality (Said 1985: 90)². For that reason, he refers to *Orientalism* as a kind of imaginative geography, which can be defined as a perceptive lens that shapes the language and experience of the Orient, and, therefore, structures the interaction between

² “In any instance of at least written language, there is no such thing as a delivered presence, but a *re-presence*, or a representation. The value, efficacy, strength, apparent veracity of a written statement about the Orient therefore relies very little, and cannot instrumentally depend, on the Orient as such. On the contrary, the written statement is a presence to the reader by virtue of its having excluded, displaced, made supererogatory and such *real thing* as ‘the Orient’” (Said 1978: 21, italics in the original).

the East and the West (Said 1978: 58). Extending his argument further, I want to offer the experience of Canada as a long narrow strip of asphalt or, increasingly, as discount airlines and fibre-optics fold space and time, several urban nodes of information traffic, as “less a fact of nature than it is a fact of human production” (Said 1978: 90); that is, the interaction between people and their material and organic environment is shaped by production of a certain imaginative geography. From this perspective, it is possible to conceive of the livelihoods fashioned by a people as less a response to the underlying ecological or economic realities of a place and more the result of a particular mode of understanding. The discourses that frame this understanding embody political objectives and moral claims about who we are and what nature is and what should be; they are made by people with institutional and ideological affiliations; and they have a history that can be made the object of analysis.

An Empire of Rivers

The early colonial history of the Canadian West begins with an empire of rivers, as Storrie and Jackson (1972) have explained in their fascinating essay on Canada’s multiple and overlapping geographies. A commercial *thalassocracy* was constituted by the Hudson’s Bay Company (HBC), once it managed to escape its reliance on the Royal Navy during the course of the eighteenth century³. At the gateway to western Canada sits Lake Winnipeg, filled by the headwaters of the Saskatchewan River and drained into the Arctic by the Nelson River. From the tributaries of the Nelson-Saskatchewan, the ocean can be reached in any direction: “east to the St. Lawrence, south to the Gulf of Mexico, west to the Pacific, or north to the Arctic, in each case with few troublesome

³ A thalassocracy is an empire whose political, economic, and military influence is extended by the tributaries of a system of rivers or canals. It tends to hold considerably less sway over inland territory.

portages” (Storrie and Jackson 1972: 314). The commercial state organized by the HBC had neither the will nor the logistical capacity to dominate the political economy of the vast interior plains of the Canadian West. Yet their empire stretched throughout and beyond the territorial expanses of modern-day western Canada. It was an empire extended by canoes, bateaux, and York boats, which penetrated the waterscape of the Canadian West in order to shape Indigenous commercial practices in a manner that could profitably be linked-up with the fashion trends of the Parisian and London bourgeoisie. This early colonial period, contoured predominately by a geographical imagination that flowed through the branches of a vast river empire, would gradually come to be overlain from the middle of the nineteenth century onward.

Imagining capitalism

In 1869, for £300,000 and one-twentieth of all the land suitable for agriculture, the executive of the Canadian government purchased the property rights to “Rupert’s Land” from the HBC. Three provincial jurisdictions would eventually emerge along the Prairie region of the Canadian West; however, the region was first designated for “a period of colonization and ‘tutelage’ until the land might be settled like that of the East” (Findley and Sprague 2000: 213). A new geographical imagination arose after this event, inspired by the political and economic discourses of an imperialist capitalism as practiced in the states of modern European. Its architects had been encouraged to immigrate to Canada after their zealous political, legal, and scholarly campaigning led to Britain’s Great Reform Bill of 1832. It has often been remarked that these reforms officially mark the fall of mercantilism in Britain, and that they served as the blueprints for the transfer of power from the landed aristocracy to a bourgeoisie with its power hedged in industrial

enterprise (203). The political technology enabled by Canada's *National Policy* during the subsequent decades was to act upon the Prairie region as a sort of colonial possession, a producer of natural wealth, staples, forestry, and mineral resources, as well as a market for the manufactured goods of the industrial core to be constituted in central Canada (Conway 1994: 13). All but disappeared were the forts and trading posts of the HBC river empire, replaced by the nodes of a network of railways and then highways in Regina, Edmonton, and the like; urban centres for transporting and refining the natural resources of the Canadian West and warehousing and distributing the commodities produced by central Canada and, in time, the rest of the global capitalist economy.

It would be a mistake to suppose, however, that the ascendance of a geographical imagination conducive to capitalism and imperialism meant the abandonment of the tributaries of the early colonial river empire; rather the waterways of the Canadian West have been re-inscribed and re-constituted to suit new political, economic and cultural imperatives. Indeed, the efforts of the current prime minister, Stephen Harper, to spin the country as an 'energy superpower' is merely a grandiose version of the long-held political economic strategy of the Canadian state, which has historically been based on the exploitation of natural resources. It would be difficult to overestimate the salience of water to this strategy, as it is a crucial dimension of the state's power generation (Froschauer 2000), agricultural output (Klassen and Gilpin 1999), not to mention the ambitious plans for the extraction of more than a trillion barrels of oil from the tar sand deposits in northern Alberta (Roberts 2005: 208-9; see also, for example, Dutka et al. 1995). The water of the Prairies is now among the most intricately managed in the world (Government of Canada 1996). The structural integrity of this expansive water

infrastructure is in a state of rapid decline, as its surrounding ecology deteriorates, and global warming begins to disrupt the quantity, location, timing and reliability of supplies (Government of Canada 2003). At the same time, the waterscape of the Canadian West is increasingly haunted by the ghosts of the former empire; voices of agricultural consumers, industrial and urban users now mingle with the struggles over ecological concerns and the resistance of First Nations people, who were excluded from meaningful participation in the design and construction of the modern water landscape.

Governing from the stern of a canoe

What sets a canoeing expedition apart is that it purifies you more rapidly and inescapably than any other. Travel 1000 miles by train and you are a brute; pedal 500 miles on a bicycle and you are basically a bourgeois; paddle 100 miles in a canoe and you are already a child of nature

- Pierre Elliot Trudeau, 1944⁴

Arguably the most significant and interesting feature of the contemporary geographical imagination is the way in which the landscape's water has come to play a central role in the Canadian lifestyle or, at least, in the reverie about what that lifestyle ought to be. "A water front cottage and a boat are to a large extent the contemporary Canadian dream, and one that is realized for large numbers" (Storrie and Jackson 1972: 314). Even if this overstates the case (and no statistical evidence is offered), there is no disputing the general force of the claim. The lakeside cottage retreat and water-related recreational activities have become an important part of the Canadian imagination and the imagining of Canada. Evidence of this can be found in the sensitivity of the Canadian public toward environmental issues that concern their rivers and Great Lakes, indignation that spreads

⁴ Quoted from an essay written by Trudeau in 1944, cited in "The Right Honourable Pierre Elliot Trudeau 1919 - 2000," Northern Currents (Online Trade Magazine), Fall 2000, Page 1, [Available Online] <http://www.nahanni.com/newsletter/fall2000/?page=1> [July 2006]

well beyond the economic institutions directly affected (314). Replicating the iconic images of Pierre Trudeau negotiating the waters of the Canadian Northwest, with the intimacy afforded by a solitary canoe, has become obligatory for politicians aspiring to demonstrate concern for the environment. It is no coincidence that, now, as I turn to the third-page of a recent “Saturday Edition” of *The Globe and Mail*, I encounter an image of Jack Layton, leader of the left-leaning New Democratic Party (NDP), and Olivia Chow, his wife and fellow Member of Parliament, who are apparently “spending their holidays paddling the Nahanni River in the Northwest Territories” (Taber 2006: A3)⁵. Less easily recalled is the complicated relationship the Trudeau administration actually had with the Northwest and its Indigenous peoples. The Northern Pipeline Act of 1978, for example, reflected the will to continue to exploit the natural resources of the northern frontier at the expense of its more permanent residents, while the 1969 White Paper advocated the eliminating the ‘special rights and status’ held by Aboriginal people (Timpson 2002/2003: 49, 52). Trudeau favoured the canoe before it was fashionable, and before the graphic text of a politician in a canoe was read as it is now. “While intrigue about Trudeau’s relationship with women...persisted throughout his life, efforts to immortalize the link between Trudeau and the Canadian North emerged in quite a complicated fashion after his death” (42). The central importance of the recreational and leisurely experience of water and the political strategies that organize this experience are less a product of Trudeau’s liberalism than they are the product of an emerging geographical imagination.

⁵ The *Globe and Mail* has the largest weekday paid circulation (318,000) of Canada’s two national newspapers. It is owned by a large corporation, Bell Globemedia, and proclaims itself to be geared toward “managers, professionals and decision makers who are willing to pay full price for subscription.” (Blackwell 2004: B7). The third-page is prime real estate in the “Saturday Edition,” which is the thickest and priciest edition circulated.

A recent media campaign designed to promote the celebration and defence of the boreal forests of the Canadian Northwest illustrates well how the dominant geographic imagination of present-day Canada has reread the image of Trudeau the canoeist. In 2003, when Justin Trudeau assumed the stance of his father at the stern of a canoe travelling along the Nahanni River in the Nahanni National Park Reserve, he uttered “Absolutely gorgeous. Huge cathedral-like canyons, as deep as the Grand Canyon and way better because (a) it’s unspoiled and (b) [with a slight laugh] it’s in Canada” (Baldwin 2004: 191). The message could not be more clear; the boreal forest is good because it is preserved in a state of pristine and primordial beauty; a beauty which reflects all that is good about the Canadian identity (read: not American); a beauty that can be managed and controlled like a canoe from its stern. It is difficult to argue with the central thrust of Andrew Baldwin’s (2004) critique of this campaign: the rock-stars, hockey stars and celebrity scientists that accompanied Justin, represent the privileged gaze of privileged Canadians, which is neither indicative of how average Canadians experience the ‘wilderness’ of the northwest, nor should it be. The point, however, is that the nationalistic and managerial spirit that suffused this campaign are the predominant features of the geographical imagination of the politicians, bureaucrats, experts and scientists authorized to represent and govern nature in late-modern Canada. It is a vision that crosses the floor of the political spectrum in this country. Hence, the left-wing hysteria over the apparent threat posed by American corporations intent on ‘stealing our’ water (e.g. Barlow and Clarke 2002). The struggle over the governance of nature in Canada is, perhaps uniquely, played out at the cottage, over recreational activities, and between people who identify with and people who are marginalized by this definition of

what it means to be Canadian. And nowhere is this new reality of representation more apparent than in the summer retreats of the Canadian West.

Travel north of Regina, Saskatchewan, and the seemingly endless prairie horizon drops suddenly out of view and into the Qu'Appelle Valley. Its rugged contours carved by ancient glacial meltwaters, the Qu'Appelle River now meanders through a 430 kilometre corridor, from the north-western headwaters of the South Saskatchewan River east to the Assiniboine River of Manitoba (Herriot 2000). Known as the "Calling River," or "Katepewewcippi-Wiyeniwak," in the Indigenous languages of the region, oral histories suggest the River system has been a place of refuge and tremendous economic, cultural and spiritual significance to the Assiniboine, Cree, and Saulteaux First Nations from time immemorial (Stonechild and Peigan 1982: 1-4). Approximately halfway through the course of its journey to the Assiniboine River, the Qu'Appelle opens up into a series of "chain lakes." From west to east, the chain lakes are comprised of the four fishing lakes of Pasqua, Echo, Mission, and Katepwa, as well as Crooked and Round Lake. After reaching the Treaty Four agreement with the federal government, 15 September, 1874, the descendants of the abovementioned First Nations settled on a series of reservations neighbouring the chain lakes (Government of Canada 2004). Toward the second half of the twentieth century the size of lakes was enlarged considerably by a series of dam structures and the canalization of the Qu'Appelle River. Originally designed to facilitate stock watering and irrigation, the larger lakes were soon made to handle the rising flow of urban effluents and industrial runoff from the downstream urban centres of Regina and Moose Jaw, as well as groundwater seepage from nearby agricultural practices, which were increasingly capital- and chemical-intensive. More recently, the lakes have become

a primary site of a growing economy of leisure and recreation for the region's burgeoning middle-classes; and the overriding purpose of the enlargement gradually morphed into an aesthetic enhancement (EBA 2003). This paradoxical arrangement of the water landscape was more difficult to sustain for the permanent and Indigenous residents, who have historically carved out large portions of their livelihoods from the environs afforded by the Qu'Appelle River system. In the spring of 2003 a group of First Nations people, organized under the umbrella of the Qu'Appelle Valley Indian Development Authority (QVIDA), refused the Saskatchewan Water Authority access to the land conferred by their treaty and delivered an ultimatum to the provincial government: surrender control and provide riparian rights to the Qu'Appelle River or the dams constructed on their reservations will be dismantled and removed, after which legal action will be taken over the ecological costs of land reclamation (Gross 2003, 2003a; Peigan 2003, 2003a, 2003b, 2003c). Negotiations continued to stall and the chain lakes did not rise that summer as had been their custom (Wood 2003). Dissatisfied with the parameters of the debate found in the local media, in April of 2004 I undertook the task of researching the history behind the dispute. My undergraduate training at the department of sociology and social studies at the University of Regina was grounded strongly in classical Marxism, taught by professors with an extensive background in alternative development field work and projects conducted in rural North America, Haiti, El Salvador and Chile. I had developed an understanding that applied the theoretical system and political critique found in those texts with which I was familiar, *Capital* (1976), the *German Ideology* (1968), and the *Communist Manifesto* (1955), and less familiar, the *Prison Notebooks* of Antonio Gramsci (1971). Yet my conversations with and reading of scholars who possessed

intimate knowledge of the Aboriginal stake in the dispute increasingly made it glaringly apparent: the title of the organization was a misnomer, the desire of the Aboriginal stakeholders was not an alternative scheme of development but rather an alternative to development. This seemed to lend credibility to the anti-Enlightenment perspectives, which had recently risen to prominence in environmental sociology. Their central contention is that modern science and technology are ultimately incapable of grasping nature and, therefore, are inappropriate guides for deciding how the relationship between humanity and nature ought to be constituted. Any movement in this direction, however, was blunted by my suspicion that they presented a highly idealized version of history and, thus, future options. Though I was not so naïve as to imagine that I could somehow ‘move beyond’ the encompassing sweep of these two poles of inquiry. Before moving on to discuss my proposed compromise, the not insignificant attraction to the sophisticated arguments of the romantic and Faustian theoretical approaches must be fleshed out in greater detail.

III. The problem with water: Faustian tragedies and romantic retreats ⁶

The tragedy of Doctor Faust

This American West can best be described as a modern hydraulic society, which is to say, a social order based on the intensive, large-scale manipulation of water and its products in an arid setting. That order is not at all what Thoreau had in mind for the region. What he desired was a society of free association, of self-defining and self-managing individuals and communication, more or less equal to one another in power and authority. The hydraulic society of the West, in contrast, is increasingly coercive, monolithic, and hierarchical system, ruled by a power elite based on the ownership of capital and expertise. Its face is

⁶ The subsequent characterization of these two schools of thought as ‘Faustian’ and ‘romantic’, indeed the very idea that the research can be divided into two schools, is my own imposition. None of the scholars reviewed openly describes their work in this way. Nor is the former meant to suggest a literary reading of Goethe’s tragic poem can be systematically applied to Marxism; though Marx was surely familiar with Goethe and it is employed here in that familiar sense, as a metaphor for a certain mode of thinking found in the social sciences and humanities. Similarly, romantic retreat should not be taken to suggest an adherence to Romantic philosophy or aesthetics but rather an emphasis on the emotional side of meaning and a retreat from the promises of the Enlightenment.

reflected in every mile of the irrigation canal. One might see in that reflection the qualities of concentrated wealth, technical virtuosity, discipline, hard work, popular acquiescence, a feeling of resignation and necessity – but one cannot find in it much of what Thoreau conceived of as freedom.

- Donald Worster, 1985: 7.

The high stakes drama of the modern water crisis has been written and critiqued according to two schools of thought. Each combines theoretical and political ambitions. From one direction, told compellingly in the annals of Marxist geographers and historians, the narrative takes the shape of Goethe's tragic Enlightenment poem. The quest to realize our innate capacities and understand nature through reason is perverted into the domination of nature by industry and empire for the purposes of greed and self-interest with disastrous consequences for humanity – which has, literally, “sold its soul.” Donald Worster begins with the failed promise of Anglo civilization achieving “a life of simplicity, independence, magnanimity, and trust” in the ‘wildernesses’ carved out by the Indigenous peoples of North America, as found in the reflections of Henry David Thoreau (1937 [1854]): 253). The subtext here is a whole host of promises the Enlightenment was to fulfill, which served as the basis for the powerful critiques of scholars as disparate and articulate as J.S. Mill and Karl Marx: from the *emancipation* from physical and material wants and needs to the *emancipation* from structures of absolute rule, arbitrary authority and inherited privilege, as well as the even “vaguer proposition” of *self-realization*, which “called for the release of the creative and imaginative powers with which humans are individually endowed and the opening up of new vistas for individual human development” (Harvey 1996: 122). Told with vigour in Worster's history of the American West, the forces of science and technology unleashed by the Enlightenment are lent to the “large-scale manipulation” of people and water

rather than emancipation and self-realization. This is the story of the production or construction of nature; in this instance, the making of the modern “waterscape,” to borrow an illustrative concept from the Marxist geographer Erik Swyngedouw (1999: 444). In short, the argument is that recent history has witnessed the progressive replacement of primordial waters with what is, in reality, a hybrid “water landscape” of intersecting social, economic, ecological and cultural elements. The waterscape can be found amongst those material artefacts which make up the built environment of production and consumption – from the taps, drains, and sewers that constitute the urban circulatory system to the landscape carved out by canals, ditches, centrifugal irrigation pumps, Promethean reservoirs and hydroelectric dams, and the ubiquitous litter of polyurethane bottles.

The Faustian tragedy is informed by a variant of Marxist theory that emerged from its alignment with ecologically sensitive perspectives. This so-called greening of Marxism involved the harnessing together of two divergent and somewhat vague theoretical impulses. On the one hand, there is want of a stronger materiality for historical materialism. In an attempt to wrest it away from cultural criticism and other so-called ‘idealist’ influences, Marxism is brought into a formal alliance with critical realism, in the vein of Bhaskar’s philosophy of science (Foster 2000: 1-8). If the former ‘culturalist’ variant of Marxism stresses how the domination of people is achieved through cultural means (i.e. hegemony), which are, of course, human ‘constructs,’ then the latter greened variant lays its emphasis on the ‘natural necessity’ of the material world. In essence, Marxist-realism argues that people emerge from a biophysical world that has a prior, independent, and causal existence. From the other direction, there is a desire to broaden

the horizons of the human activity covered by the dialectical motor of historical materialism. The concept of labour is thus taken out of the factory and conceived of most broadly as a kind of ‘metabolic activity’ through which relations – *all* relations, from semiotic and scientific to sexual and widget re-production – between the natural and human spheres are mediated (Rudy 2005: 113-115). In first instance there is a reassertion of an *a priori* natural order (i.e. first nature) on which humanity depends and does not choose; and this is followed closely by a second moment in which the material and organic environment is caught in the grips of relentless transformation orchestrated by human labour (i.e. second nature). Second nature does not replace first nature, as my earlier remarks suggested, so much as overlaps with and complicates it. The hydraulic cycle, for example, can be thought of as a kind of first nature while the waterscape is a prototypical second nature.

Missing thus far is the concept of ‘material praxis,’ which provides the link between the first and second natures in Marxist theory. Material praxis refers to how – that is, according to what rationale and mode of practice – people carry out the metabolic activity that transforms first nature into second nature. Pre-modern material praxis is generally thought to be informed by custom and tradition, “the idiocy of rural life,” and feudal superstition. Whereas modern material praxis is characterized by the “Subjection of nature’s forces to man, machinery, application of chemistry to industry and agriculture, steam-navigation, railways, electric telegraphs, clearing of whole continents for cultivation, [and the] canalization of rivers” (Marx and Engels 1955: 14). The revolutionizing of material praxis creates a profound sense of alienation in that people no longer own, control or even understand the nature of their metabolic activity. Yet

modern science and technology also create, for the first time in history, the potential to “transform our relation to the world and transcend our alienation from it – creating our own distinctively *human-natural* relations – by acting, that is, through our material praxis” (Foster 2000: 5, emphasis in the original). The Enlightenment released forces of nature and reason, which had hitherto lain dormant; for nineteenth century social philosophers, the task then became the alignment of metabolic activity with the goals of emancipation and self-realization and use of material praxis to end alienation from second nature.

Despite this rather broadly drawn concept of material praxis, the main acts of the Faustian tragedy all occur in an economic setting. The theoretical and political critique of the Marxist-inspired approach concentrates on the problems associated with water ‘commodification.’ Mainstream economists and other technocratic social scientists at the World Bank have decided that water needs to be treated as a commodity, that is, a properly functioning market needs to be erected for water (World Bank 1992; 2000). Read an orthodox journal like the *Economist*, and one will learn that the problem is that water commodities have been “colossally under priced” and the solution is to “price water more sensibly,” to “cover full costs, including environmental ones” (Bond 2004: 7). In practice, the commodification of water usually implies a form of ‘privatization,’ but privatization in this analysis also means the transformation from a state-managed public resource into a commodity that can be priced, sold and owned by privately held companies (Castree 2003: 279). The commodification of water begins with the history of working class struggles to have water delivered by the state, like education and later health care, as a social entitlement (e.g. Bakker 2003; Swyngedouw 2004). This

represented progress, if limited, toward emancipation from a physical need. The efforts of neo-liberal economists to price water and allocate it *vis-à-vis* market mechanisms are, therefore, susceptible to two forms of critique. Politically, the commodification of water represents a move in the opposite direction from the promise of emancipation. A physical human need, water, is exploited for the purposes of greed and self-interest. Theoretically, this reversal is explained by the organization of economic production in accordance with the perverse logic of capitalism. Because capital has only an abstract value based on its capacity to be turned into more capital, economic (i.e. metabolic) activity is driven by a quest to quell what is actually insatiable: greed, in concrete terms. In other words, capital “is a process not a thing” (Harvey 1990: 343). Within this process the metamorphosis of capital is relentless; it takes on the form of anything assigned a value (e.g. price); capital is money; capital is commodities; capital is living and breathing labour; and, by extension, capital is water. Capital must continue to move or the value assigned to it is threatened. This logic creates the impulse to increasingly expand its terrain self-valorization in time and space. As James McCarthy (2002: 1298) has contended,

The imperatives of capitalism necessitate ongoing attacks and outrages against sustainable, democratic, egalitarian relationships within human communities and in human uses of nature at all scales. These insults to a wider range of human sensibilities and commitments than afforded space within strictly capitalist logic will continue to provoke new moral economies (in the sense of backlashes against further commodification, subordination of society to the market, and the disruptions of culturally specific forms of capitalism) as new rounds of investment and commodification disrupt established relations.

The problem with the commodification of water is, in theory, obvious. While the hydraulic cycle of first nature evolves over the course of geological time, the second nature built for capital grows recklessly for the sake of growing, exhausting everything and satisfying no one.

At first glance the Faustian narrative appears to offer a way to explain and critique the water problem in its entirety. A cursory survey reveals no shortage of organizations alerting us to the 'global fresh water crisis' – crisis! – from the Worldwatch Institute, World Resources Institute, United Nations Environmental Programme, and the International Rivers Network to Greenpeace, the Clean Water Network, Sierra Club, Friends of the Earth International (Barlow and Clarke 2002: xii). In Canada, there is the National Water Research Institute of the federal government, the Council of Canadians' Blue Planet Project and the Polaris Institute's water rights campaign offering public-policy alternatives, the Prairie Adaptation Research Collaborative (PARC), along with more modest outfits like, for example, a one-scientist operation called Freshwater Research Ltd and a one-canoe operation known as Water For Future Generations. And so on. Returning to the global scale, The World Water Council staged its fourth annual forum this past March 2006 in Mexico City, a place where 60 per cent of all potable water travels at the pleasure of the wealthiest 3 per cent and the poorest half get by on just 5 per cent (Swyngedouw 2004: 30). An appropriate setting, perhaps, to discuss a world in which 2,275 gallons of the purest possible water is combined with 20 pounds of poisonous chemicals and 20 cubic feet of toxic gases in order to produce each six-inch silicon chip, while approximately 2.3 billion people are afflicted with diseases that can be linked to contaminated water and some 13,000 people will die today from water related diseases (Johnston 2003: 75, 78). The problem, as defined by these institutional discourses with remarkable consistency, is greed and impending scarcity. Of course, there is a collegial amount of dissent over the parameters of what constitutes greed exactly and has produced this scarcity, how its effects will be realized, as well as what

ought to be done about the matter (see, for example, Graffy 2006). However, by and large, it is said that we are dealing with a situation of absolute water scarcity in the face of infinitely expanding demand. There is little denying that during the second half of the past century, the flow of surface- and ground-water captured, consumed and used increased threefold (Harper 2001: 88). According to Marxist approaches, demand and scarcity are intimately related. Following the seminal essay of the Marxist geographer David Harvey, the scarcity of resources like water is not ‘absolute’ but ‘relative’ to the economic activity within which they are produced. In a trenchant defence of the primacy of second nature, he writes that “‘resources’ can be defined only in relationship to the mode of production which seeks to make use of them and which simultaneously ‘produces’ them through both the physical and mental activity of the users. There is, therefore, no such thing as a resource in the abstract or a resource that exists as a ‘thing in itself’” (1974: 265). Two trillion dollars (USD) worth of capital was pumped into dam technology alone through the course of the twentieth century (World Commission on Dams 2000). The cyclical pulse of the world’s wetlands, rivers, aquifers and lakes were dredged and exploited, dammed in colossal reservoirs and made to flow through canals according to the upwardly spiralling rhythms of capital.

While compelling in the scope of its explanatory power and empirical evidence, the modern governance of water is both more and less than ‘commodification.’ An industrious group of scholars presently or previously affiliated with the school of geography and the environment at St. Peter’s College of Oxford University, hereafter the ‘Oxford School,’ have traced the commodification of water from England and Wales (Bakker 2003), Spain and Ecuador (Swyngedouw 1999, 2004), to Greece (Kaika 2003),

Argentina (Loftus and McDonald 2001), and Cameroon (Page 2002)⁷. Yet implicit in each of these studies is the idea that water, in the last instance, resists full commodification. As Karen Bakker cautions, “In analyzing these biophysical characteristics (or the ‘materiality’ of water), I characterize water as an inherently ‘uncooperative’ commodity, and argue that the privatization and commercialization of water is inevitably fraught with difficulty” (2003: 19). Whereas Kaika argues that, in reality, Greece actually experienced a “discursive, rather than material, water scarcity during the drought period [of the 1990s]” so that the “dominant neoliberal rhetoric and attitude towards water-resource management (i.e. demand management through pricing) could be further applied” (2003: 942, 929). All this analytical tentativeness suggests that these studies reveal something *less* than the commodification of water and the production of scarcity, as such. What they do reveal with stunning clarity is that, after the mid-1970s, there is increased investment in the waterscape by private interests and underinvestment from the public sphere (Bakker 2003a; Swyngedouw 2005: 85-87). Calling this process of social and natural change ‘commodification’ adds little but Marxist credentials. The other problem with the ‘commodification hypothesis’ is that the modern history of the waterscape involves much *more* than efforts to turn water into a commodity and the resistance of water and people. As the opening section on the overlapping experiences of water in the Canadian West explored, the modern history of the waterscape involves multiple political visions and strategies, trading empires, capitalism, and canoeists. Even if the questionable tactic of assigning priority to the

⁷ To my knowledge, no one has gone so far as to call this group the ‘Oxford School’ but the authors do share a distinctive and influential theoretical understanding. The variant of ‘political ecology’ to which they subscribe can be concisely defined as a political economy of socio-environmental change (Bakker 2003a).

economy was allowed in cases where the political economy is particularly dependent on the extraction and exploitation of nature, it remains the case that even in Canada some 95 per cent of water is presided over by the public sphere (Clarke 2005). Moreover, while vague concepts like ‘commodification’ grace the slick electronic journals of radical geographers, another history is resigned to the confines of dusty book jackets, unpublished PhD theses, and the like; that is, the history of excluding Indigenous peoples and perpetuating their marginalization into the future through the appropriation of bodies water integral to their past, present and future livelihoods (Armstrong 2003: 3, 25).

To bid a romantic retreat

Throughout history and across the world, water rights have been shaped both by the limits of ecosystems and by the needs of people. In fact, the root of the Urdu word abadi, or human settlement, is ab, or water, reflecting the formation of human settlements and civilization along water sources. The doctrine of riparian right – the natural right of dwellers supported by a water system, especially a river system, to use water – also arose from this concept of ab. Water has traditionally been treated as a natural right – a right arising out of human nature, historic conditions, basic needs, or notions of justice. Water rights as natural rights do not originate with the state; they evolve out of a given ecological context of human existence

- Vandana Shiva, 2002: 20.

The other pole of inquiry into the water crisis is overwhelmingly concerned to recover a lost history of a reverent relationship forged between humanity and nature through Indigenous practices and knowledge. Anti-Enlightenment in tenor, my characterization of this research programme as a ‘romantic retreat’ is intended as both critical and constructive. Critically, the romantic school is prone to make obvious exaggerations based on scant empirical evidence (i.e. idealizations), which are apparently justified by its scepticism of the knowledge that produces what counts as evidence; yet paradoxically, as the phrase ‘eco-feminism’ might suggest, these scholars owe many of their concepts to modern philosophy and science. Constructively, it is also evident that the romantic

approach is concerned to pose questions that the narrators of the Faustian tragedy cannot or will not ask, such as what does nature *mean* and how do we *feel* about it, as well as what should it mean and how should we feel. The central contention is that modern science and technology are ultimately incapable of grasping nature and, therefore, are inappropriate guides for deciding how the relationship between humanity and nature ought to be constituted. Because the theoretical composition of this work is defined by its opposition to, rather than its formulation of, a hypo-deductive model, and its political critique by a recovery of alternatives rather than their proposition, there are less specific claims to review here. However, there are discernable assertions.

The etymological argument, found in the passage quoted from Shiva above, takes the reader to the cradle of civilization and the gentle evolution of a Persian language from a period of relative harmony between people and water. This argument is a variation on the Whorf-Sapir hypothesis, familiar to students of social anthropology. It begins with the detailed study of societies indigenous to North America. These anthropological studies lead to the discovery that although Indigenous people ostensibly live in the same natural environment they experience realities which are often radically different than their European neighbours. In short, the Whorf-Sapir hypothesis is that these different realities are enacted and evidenced by the languages attributable to the various Indigenous peoples. The most infamous example being the plethora of Inuit words for what is known in European discourse as simply “snow”. The theory is that these words enable a more complex, and perhaps more intimate, way of perceiving, understanding, and acting toward “snow” than are afforded by “snow” (Harvey 1996: 83-6). David Harvey cautions that uncritical adoption of the Whorf-Sapir hypothesis can lead to a sort

of “linguistic determinism”; that is, experience appears determined by language (1996: 84). If dangerous in this respect, there are also at least two obvious advantages to taking up Shiva’s etymological strategy.

First, it releases historical analyses from a vulgar geographical determinism, by demonstrating that the “same” material and organic reality can be imagined and experienced differently. Though Marxists emphasize equitable allocation and neo-liberal economists stress efficiency, they cover the water problem with a common vernacular of terms like scarcity, degradation, and commodity production. Recalling the overlapping geographical imaginations that have constituted the history of the Canadian West, the dimensions of the water problem cannot simply be assumed to be a fact of nature. In accepting this technocratic parlance as the boundaries of the discussable, organizations implicitly informed by variants of these discourses (e.g. Barlow and Clarke 2002, Clarke 2005, authors affiliated with the above listed Polaris Institute and the Council of Canadians), actually contribute to the managerial and nationalistic geographical imagination of the Canoeist; that is, the environment and its water is good because it is pristine and virgin and Canadian and Canadians must manage it in order to keep it this way. With Shiva’s romantic retreat from the hegemony of this geographical imagination, it is possible to understand that people, entangled in their multiple institutional and ideological affiliations, have produced this re-presentation of the water problem.

The second not unattractive aspect of Shiva’s etymological argument is related to this point. There are other forms of knowledge about water. These subaltern and local knowledges “evolve out of a given ecological context of human existence” (Shiva 2002: 20). Unlike the Faustian tragedy of the class struggle, from this perspective social

entitlements to water do not originate with the state but are rather tied to local notions of justice which are, again, suited to the ecological context. Though grassroots knowledge is necessarily dynamic, complex and idiosyncratic, Brian Wynne has contributed a valuable analytical outline of its characteristics. The “evolution” of lay knowledge, he argues, is attributable to the “continuous negotiation between ‘mental’ and ‘manual’ labour, and continual interpenetration of production experiences” (1996: 68). More concretely, while modern science and technology began from the assumption of an ideal potato genotype that would contain the “optimal combination of properties,” Indigenous North Americans began from the opposite direction (71). Their cultural practices undertook to select “potato seeds – the genotype – according to the variable environmental conditions of the plots – the phenotypes – (and other selecting criteria), and continually monitored and adapted such selection over a long and complex feedback cycle” (70). The force of this critique lies in the idea that these knowledges are both better, in the sense that they are grounded in the needs of specific communities and places, and that their recovery might engender a measure of local control to people over their present and future livelihoods.

There are dilemmas encountered, however, by following the path blazed by eco-feminists like Shiva. At first glance the theory appears rather anachronistic. The epistemological systems of modern social and natural sciences – or the philosophical paradigms like ‘evolution’ through which modern science claims to know what it knows – blend freely with a past that stretches back to the dawn of civilization. In one brief and complicated statement there is mention of “rights,” the use of ecology, and, for good measure, Heidegger’s (post?) modern phenomenology of being as “dwelling” is also

dropped⁸. Upon closer inspection, however, I think that Shiva's argument attempts to bid a romantic retreat into the past; it is not "anachronistic" so much as it is ahistorical. This can be demonstrated by briefly examining the history of the ideas of ecology. The epistemology of the science of ecology can be traced to work of Ernest Haeckel, a prominent disciple of Charles Darwin. When Haeckel coined the term 'oecologie' in 1866 he had "the science of relations between organisms and their environments" in mind (Hannigan 1995: 115). It is well documented that Marx was influenced by his close study of the emerging life sciences (e.g. Foster 2000: 9)⁹. The irony less often remarked upon is that Haeckel's epistemology can be thought of as an extension of political economy to the world of plants. Oecologie arose as the systematic study of the optimal disposition of things by Nature, literally the study of *Nature's Economy*, in Worster's (1977) turn of phrase. The concept "ecosystem" as deployed in Shiva's work emerges more recently. Coined by British plant ecologist Arthur Tansley in the mid-1930s, ecosystem referred to the "exchange of energy and nutrients in a particular natural location (Hannigan 1995: 117). Eco-system was meant to oppose the anthropocentrism inherent in Frederic Clements "climax community" concept, which had taken the

⁸ Dwelling is a foundational concept for post-development theorists, and sympathetic eco-feminists. "To dwell means to inhabit the traces left behind by one's own living, by which one always retraces the lives of one's ancestors. 'Dwelling' in this strong sense cannot really be distinguished from living. From day to day dwellers shape the environment. In every step and movement people dwell. Traditional dwellings are never terminated" (Illich 1985: 8). Behind 'dwelling' is the idea that people, historically, were able to shape the contours of their environs which, therefore, reflected and were suited to their lives. Whereas in the modern epoch dwelling takes on connotations associated with brooding, staying in the same place, and, of course, not improving or developing. The confines of urbanity are thus designed of glass and steel and concrete in order to remain free of all unpleasant smells, dirt, and other residues that might leave behind traces of people's lives.

⁹ Marx is known, for instance, to have attended Thomas Huxley's series of lectures on "Evidence of Man's Place in Nature" (Sheasby 2004: 54), who's popularization of Darwin took in the broad sweep of human evolution, from physiology (or biology) to geology (see, for example, Huxley 1894). More tellingly, perhaps, in a letter to Frederick Engels in December of 1860 he wrote that Darwin's "*The Origin of the Species*, 'although developed in a crude English manner,' nevertheless 'lays bare the natural-historical foundation (*Grundlage*) for our view'" (Bassin 1992: 5).

discipline by storm in the mid-1920s. Both concepts share the idea that nature's economy gradually evolves until it reaches the optimal allocation of the energy and nutrients between the plants and non-human organisms in a given system. Dealing with open-systems, manifold exchanges between organisms and plants, and climatic contingencies, made drawing strict lines of causation difficult and predictions were heavily qualified. Ecology was on the fringes of the natural scientific establishment, and wary of damaging the discipline's already weak epistemological status through involvement in political affairs (Hannigan 1995: 117). This aversion coalesced well with the theory that systems reached their optimal capacity when the invisible hand of nature was allowed to operate with minimal interference. There is, then, a strong tendency in ecology toward anti-humanism, which has resided at the core of its epistemology since its formative period. It is no coincidence that ecology has shifted from the fringes to a place of prominence in government, academic and public discourse at precisely those moments when it has appeared that Man is the enemy of Nature. During the dust bowl of the 1930s, "American environmentalists lay as well as scientific, relied heavily on Clements' climax theory as a yardstick by which man's intrusions into nature could be measured. Their basic assumption was that the aim of land-use policy should be to leave the climax as undisturbed as possible" (Worster 1977: 234). When the new ecology emerged in the 1970s it was decidedly more subversive. Rachel Carson's issued a poignant attack on the industrial-pesticide complex in *Silent Spring*, 1962, while Barry Commoner, *The Closing Circle*, 1971, led a full frontal assault against modern technology and the corporations that support it; both were read voraciously (Harper 2001: 353). And it is fair to assume that Shiva's ecology is infused with the new ecology's strident anti-capitalism.

Now it must be immediately recognized by advocates of the romantic retreat that using a cutting-edge scientific epistemology, even if it has a reputation for radical politics and residing on the fringes of the establishment, to underline the fallaciousness of modern science is self-refuting and, at the very least, not terribly convincing. This is why I suggested that the argument was, at first glance, anachronistic; that is, it is as though it is being argued that ecology is, in fact, a recovered subaltern knowledge. In other words, grassroots knowledge is ecological knowledge. The history of ecology suggests otherwise. Ecology cross-pollinated with classical political economy, taking on a distinctively *laissez faire* (i.e. nature knows best) attitude, which leads to advocating the minimization of human “interventions” in nature. Instead, Shiva is using the epistemology of ecology to lend scientific credibility to her vision of the past as sustaining a stable, intimate, and climatic relationship with nature. Ecology is de-historicized and used to uncover an always-already exiting reality. The problem with this strategy is threefold. In the first place it romanticizes human history, and this lends itself to an aversion to change and naïve political remedies.

Indigenous groups can, however, also be totally unsentimental in their ecological practices. It is largely a western construction, heavily influenced by the romantic reaction to modern industrialism, which leads many to the view that they were somehow ‘closer to nature’ than we are...Faced with the ecological vulnerability often associated with such ‘proximity to nature,’ indigenous groups can transform their practices and their views of nature with startling rapidity (Harvey 1993: 29).

While Harvey’s description of these practices as ecological is problematic, he articulates the first two points well. The idea that indigenous peoples lived in an intimate and climatic relationship with nature is, in fact, produced by modern knowledge like ecology, just as the attribution of stability can be linked to colonialism. It may very well be that, for example, the acceleration of dam construction and the associated agricultural shift observed in India is making the rural economy a place unfit for its near 700,000,000

inhabitants (Harvey 2003: 161). But is this an opportunity to escape the rigor and drudgery of the caste system, or the destruction of an idyllic (and ‘natural’) social fabric as the activist and scholar Vandana Shiva (2002) has suggested?¹⁰

In any event, the romantic retreat leads to rather naïve political proposals. In an open letter to Monsanto entitled “In Praise of Cow Dung,” Shiva begins: “In India we worship cow dung as Lakshmi, the goddess of wealth. Gobur-dhan puja is literally the worship of gobur (cow dung) dhan (wealth). Cow dung is worshipped because it is the source of renewal of soil fertility and hence the sustainability of human society” (2002a). After outlining the etymology of cow dung, she continues:

A century ago, Sir Alfred Howard, the father of modern sustainable farming wrote in his classic, *An Agricultural Testament*, that, ‘In the agriculture of Asia we find ourselves confronted with a system of peasant farming which, in the essentials, soon became stabilized. What is happening today in the small fields of India and China took place many centuries ago. The agricultural practices of the Orient have passed the supreme test - they are almost as permanent as those of the primeval forest, of the prairie, or of the ocean.

Howard identified the principles of sustainable agriculture as those of renewability as seen in the primeval forest. The *Agricultural Testament* is a record of practices that had maintained the soil fertility of India over centuries. Historical records indicate that the alluvial soils of the Gangetic plains have produced fair crops year after year, without falling in fertility. According to Howard, this has been possible because a perfect balance had been reached between the manurial requirements of crops harvested and natural processes which recuperate fertility. The conservation of soil fertility has been achieved through a combination of mixed and rotational cropping with leguminous crops, a balance between livestock and crops, shallow and light ploughing, and organic manuring (Shiva 2002a).

¹⁰ Against the anticipated charge of moral relativism, I would like to draw attention to the fact that the conservationists of the so-called ‘first-world’ are neither likewise supported nor presented as the heroic victims (McCarthy 2002). It is interesting that in the sociological literature directed at industrialized states it is an almost banal exercise to note rural-depopulation. Yet, at the same time, it is presented with greater complexity, as a source of both danger and opportunity. It might be illustrative to draw a contrast with an example quoted at some length: “First, substituting technology for human labour and reducing the number of people involved in agriculture makes agriculture more profitable. Labour costs are reduced and agricultural wealth is concentrated in fewer hands. Increasing technology also creates a need for greater capital investment. As a result, those people with access to capital, that is the more affluent, are able to profit, forcing the less affluent to give up their farms...Second, reducing the number of people in agriculture and concentrating agricultural wealth to ensure profits of those who remain helps keep food prices and consequently industrial wages relatively low. This creates a danger of food monopolies and the potential for a rise in prices....As it is, food cost as a percentage of the cost of living in the United States is among the lowest in the world” (Robbins 1999: 184).

The characterization of the stability of Indian peasant – or, Oriental – agriculture as analogous to the primeval forests and oceans can be attributed to an imperialist geographical imagination. Indeed, Howard, actually Sir ‘Albert’ Howard, wrote the book cited by Shiva while acting as “the Imperial Economic Botanist at the Imperial Agricultural Institute at Pusa in Bihar (and before that imperial Mycologist in the British West Indian colonies)” (D. Wood 2002). More problematic than this complicity with colonialism is the fact that by 1928, while Howard was stationed in India, a “Royal Commission on Agriculture in India reported that the soil [had] ‘reached [a] state of maximum impoverishment many years ago’ and identified a general lack of nitrogen” (D. Wood 2002). This was under the ‘organic’ farming practices recommended by Shiva; that is, no ‘artificial’ nutrients were added to the soil. What Shiva neglects is the growing population’s manifold uses of cow dung in the constitution of their livelihoods, in which manure is also “needed for fuel and as a bonding agent for plaster and mud-brick for housing” (D. Wood 2002). Shiva may well be contributing to the recovery of subaltern and efficacious indigenous knowledge, which can enable Indian peasants a measure of control not afforded by industrial-agricultural conglomerates like Monsanto. However, the ahistoricism of the romantic retreat makes for strange bed-fellows. And the relentless socio-natural change underlined by the Faustian tragedy is willfully neglected, paving the way for a political critique that is ignorant of present needs and wants, and openly hostile to the possibility of ‘artificial’ (read: human induced) change.

IV. The argument

The argument I have in mind for the present work is a modest compromise between the Faustian and romantic positions. From the perspective of Marxism (e.g. Worster 1985),

the tragedy is that water has been managed poorly under the auspices of capitalism. Social entitlements to water have been undermined, and the waterscape has been designed to service the whims of capitalist political economy. Their solution is to manage it *more* equitably, in accordance with the values of socialism, the Enlightenment promises of self-realization and emancipation. Romantics agree (e.g. Shiva 2002; 2002a); water has been poorly managed. They propose to manage it *less*. This can be achieved by minimizing the harmful interventions of science and technology and rediscovering the *laissez faire* harmony between people and nature that characterized the stable “ecosystems” of pre-history. The Faustian approach ignores present realities, such as the massive water problems confronting actually existing socialism in China, where

Five of the largest rivers are now so toxic that the water in them is literally dangerous to the touch. The Pearl River has been renamed the Heilongjiang, or Black Dragon, because it is so dark with pollution. A mysterious 82-mile-long brown plume swept down it [last] summer wiping out millions of fish and depositing yellow foam and garbage along the shorelines (Arnold 2005).

On the other hand, the romantic retreat ignores past realities, such as the historic vulnerability of rural India to famines and soil degradation, which would have rendered a romantic sensibility toward nature quite dangerous. While their solutions are uninspiring, these two schools have contributed valuable insights into the history of how social power has come to be registered in both the economic practices (e.g. the material artifacts of water storage and distribution) and the scientific discourses that surround and constitute water.

I want to argue that the historical analysis of the present would be better served by seeking to uncover how such modes of reasoning and acting are implicated in how we have come to govern water. The analysis will be organized not around what water *is* – in

an essential, ecological or biophysical sense – but rather how programs of rule have sought to constitute water as a particular object and living and breathing people as particular subjects in order to govern them. After Foucault, government is construed most broadly and beyond strictly economic terms. Government here refers to the quintessential method of exercising power in the modern epoch.

To summarize, briefly, Foucault reserved his critique of the exercise of power for that most insecure knowledge found in the human sciences – psychology, psychiatry, criminology, sociology, and the like – judging, perhaps, the relations between power and the natural sciences to be obfuscated by their epistemological maturity (Smart 2002: 64). Playing on the Janus-faced semantics of the word subject, he argues that the disciplines through which humans gather knowledge of themselves simultaneously subjugate people while rendering them thinking, feeling and capable entities. Clinical discourses, for example, constitute subject positions, such as that of a doctor, from which it is possible to postulate certain diagnoses and recommend techniques of intervention upon the object of their thought, e.g. a patient, for the purposes of normalization, training, and so on. From the other direction, Foucault traces the history of procedures through which one cares for and develops knowledge of the self, such as sexuality. ‘Governmentality’ then refers to a continuum of power relations, from projects designed to shape the conduct of others to reasoned efforts to shape the conduct of the self (Foucault 1994: 226). Whereas Foucault sets aside the concept domination for those uniquely stable and asymmetrical relations of power in which the scope of conduct enabled is severely limited. It is these “states of domination that people ordinarily call ‘power’” (Foucault 1994a: 299). On the whole, the *governmental* regime of power involves a more subtle yet more pervasive recasting of

living, breathing people as a population to be cultivated in accordance with rationally determined objectives (Dean 1999: 20). Indeed, for Foucault (1991a) the quintessential feature of modernity is the proliferation of these ‘mentalities’ through which the terrain of human conduct open to governance progressively expands. As Arturo Escobar (1999; 1998) has suggested, governmental rationales and technologies – sustainable development, scientific forestry, biodiversity conservation and plantation agriculture, for example – have also constituted the material and organic environment as an object of expert knowledge. The history of how networks of scientists, developers, ecologists, technocratic economists and bureaucrats have simplified, regularized, planned for and appropriated the natural order has yet to be written (Escobar 1999: 6).

The following chapters will be dedicated to fleshing out an analytic and history of how *projects intent on reconfiguring the contours of nature have been implicated in projects designed to shape the conduct of governing and govern the shape of conduct*. It is not inevitable that we should now govern water and ourselves thus. And the purpose of this thesis is to reveal that governance is, in fact, formulated through an array of rationales, from the mythical to the statistical, assembled into manifold techniques for intervening into nature and the lives of people, which rest unstably on moral and political claims that can be made the object of protracted struggle (O’Malley 1992: 259; O’Malley 2000). This analytical history is not intended as an alternative theoretical model, in the vein of Marxist analyses, through which a better regime of water governance can be deduced; nor is to suggest that we can retreat from governance and allow the invisible hand of nature to run its course. The value of this study lies in its weighing of the costs and benefits, ethical dilemmas and environmental implications associated with particular

frameworks of water governance. This paper is thus intended as a tool for destabilizing the assumptions which underwrite the hegemonic geographical imagination, and as a tool for those that might want to consider how we might choose to “govern ourselves differently” (Rose 1993: 323). If there is any implicit moral imperative, it is said best by Kate Soper when she suggested that “what [are] really needed, one might argue, is not so much new forms of awe and reverence of nature, but rather to extend to it some of the more painful forms of concern we have for ourselves (1996: 31).

The plan for the present work is as follows. Chapter two will tackle the sticky philosophical questions confronted when applying Foucault’s concept of governance to natural objects like water. As mentioned above, Foucault avoided tackling the governmental constitution of the “territory and its qualities,” and not without reason. The connections are terribly complex and at times entirely opaque. To argue that nature is constituted as an object through discourses and practices is not to deny the existence of a reality, ‘out there,’ independent of people’s consciousness of it, but rather to insist that nature – and water – can only exist for us to the extent that our knowledge and practices make it intelligible and practicable (Kovel 2002: 89). This creates a dilemma in that biophysically determined and culturally constructed realities must both be accounted for and balanced against one another. The point of entry into this debate is the so-called ‘science wars,’ which amount to a pitched intellectual battle over the status of objects and objectivity. From Raymond Williams (1980), I propose to destabilize the notion of a singular and abstract Nature and to recognize that there are multiple natures. Following Foucault, it will be suggested that these natures are constituted through the ‘discursive practices’ of government. Broadly interpreted concepts of discourse and government are

elaborated upon for the purposes of tracing the history of this constitution. In order to examine the history of water governance, Foucault's genealogical methodology is critically explored. Examples of governing water and people through their discursive constitution as a particular subjects and object are then drawn from the 'water wars' literature.

Chapter three will examine the difficulties encountered by the most important social theory of water: the state-hydraulic hypothesis. In a sense, the two schools elaborated upon above converge in their adoption of this theoretical approach, and reflection upon its antiquated assumptions is long overdue. An application of Foucault's (1980) critique of the economism of power will reveal the inadequacies of the state-hydraulic hypothesis. However, the intention is also to reveal some of the problems inherent in Foucault's suggestion that power exists in only action; namely, it excludes power that resides in objects, silences, and those things which cannot be done.

Chapter four will return to the analytics of government and the struggle over the Qu'Appelle River system which began this journey into the philosophical and theoretical approaches to water found in the social sciences and humanities. A critical governmentality of early colonial water governance in the Canadian West is undertaken. It is argued that, as the powers of governance expand, the analytic of government must be expanded to take on theories of moral regulation and Marxist-inspired historical and geographical approaches. Chapter five concludes with thoughts on an agenda for an analytically sophisticated yet politically relevant social theory of water history.

Chapter two: ontology, epistemology, method; or the science wars behind the water wars¹¹

And I am prepared to believe that one or other of the consequent generalizations [about what is now so often seen as the physical crisis of our world, the latest reports from those who are observing and qualified to observe these particular processes and events] may be more true than the rest, may be a better way of looking at the processes on which we can be said to depend. But I am bound to say I would feel in closer touch with the real situation if the observations, made with great skill and precision, were not so speedily gathered – I mean, of course, at the level of necessary generalization – into singular statements of essential, inherent, and immutable characteristics; into principles of a singular nature. I have no competence to speak directly of any of these processes, but to put it as common experience: when I hear that nature is a ruthless competitive struggle to survive I remember the butterfly, and when I hear that it is a system of ultimate mutual advantage I remember the cyclone. Intellectual armies may charge each other repeatedly with this or that example; but my own inclination is to ponder the effects of the idea that they share: that of a single and essential nature, with consistent and reconcilable laws...what is often being argued it seems to me, in the idea of nature is the idea of man; and this not only generally, or in ultimate ways, but the idea of man in society, indeed the ideas of kinds of societies.

- Raymond Williams, 1980: 70, 71

I. An introduction to the nature of water

The purpose of this chapter is to unravel the philosophical dilemmas raised by the endeavour to write an analytical history of the ways in which water is constituted as an object to be governed. To claim that nature in general and water in particular is constituted as an object through government is not to deny the existence of a reality, 'out there,' independent of the actions and consciousness of people. The point is rather to come to terms with the fact that nature can only exist for us to the extent that our knowledge and practices make it intelligible and practicable (Kovel 2002: 89). This presents a philosophical dilemma: the biological and physical processes that make up the

¹¹ Please note that the title of this chapter is meant as neither an endorsement of war nor an endorsement of calling the philosophical debate or the struggles over water 'wars.' Indeed, the point of this chapter is to undermine both of these familiar ideas. Although, perhaps, in the end it can be said that they earned the title 'wars' through the intellectual drama that surrounds the former and the violence and insecurity that accompanies the latter.

reality of water must be accounted for whilst acknowledging that this reality cannot be divorced from the contingencies of time and place, political struggles and moral claims which bring it into existence for human beings (Escobar 1999: 3). The solution proposed here to this philosophical impasse is to argue that there is no access to water independent of discursive practices, by which is meant both ways of thinking and ways of acting. These discursive practices must also be linked with the exercise of power and the art of governing things and people. This governance has a history that can be traced using the ethos of analysis found in the 'genealogical' methodology. In that vein, this chapter will begin with Raymond Williams's bequest to historicize our ideas of nature/Nature. A brief examination of the widely popular notion of wars over water will then suggest a manner through which the history of nature might be linked up with the exercise of power, and the struggles of the "intellectual armies" hinted at but never pursued by Williams or his interlocutors. A brief discussion of the 'science wars' will introduce the philosophical divide that the concept of discursive practices is intended to resolve or, at least, make analytically resolvable for the purposes of research. After unpacking the ontology and epistemological assumptions inherent in a broadly defined concept of 'discursive practices,' the genealogical methodology is critically explained and examined. In conclusion, it is suggested that to be effective for the study of the history of water governance as a genealogical analysis must incorporate certain 'realist' notions of a (lower case-n) nature of water.

II. Water wars and the will to govern

In his seminal lecture, "Ideas of Nature," Raymond Williams begins by noting that the "idea of nature contains, though often unnoticed, an extraordinary amount of human

history” (1980: 67). The most relevant history begins with the “revival of systematic physical inquiry,” or science, and the extended period of negotiation that followed between a monotheistic God and Nature (69). From this dialogue emerges a Nature that takes on many of the characteristics previously attributed to God. God may have died around this time, remain dead, and it might very well be us that killed him, as Nietzsche so famously provoked (1974 [1887]: 181). The men of science willing to purge their work of God, however, also tended to maintain and even stress a “comparable principle: the singular and abstracted, indeed still often and in some new ways personified, Nature” (Williams 1980: 69). It is well known that Nature was, for instance, personified as the selective breeder in the popular accounts of Darwin’s theory of evolution. But this personification is more pernicious and very much alive in the familiar “Nature *knows* best” refrain of the new ecology. At the same time, the semantic duality of the word nature was gradually eroded. To describe a thing as natural came to mean making a statement about the particular *qualities* of a thing as well as the underlying *essence* of all things. In this way, one ideal abstraction, God, is replaced with another, Nature. “To know Nature was to know God” (71). Significant wrangling continues to this day over the appropriate way to know Nature, but it retains a kind of metaphysical priority as the singular and abstract principle around which all things are organized.

At the risk of putting too fine a date on it, perhaps it could be said that this Nature began to (re?)assert itself in the disciplines of the social sciences and humanities following Earth Day 1970; a surprisingly massive demonstration of some 20 million participants, organized as a protest against, and teach-in on, the degradation and depletion of the planet’s natural resources (Harper 2001: 354); analogous to May 1968, and that

these events share a critique of state and corporate technocracy driven by “profit and progress” suggests that they are not entirely unrelated (Feenberg 1999: 21), Earth Day has been made to signify evidence of a broad shift in societal consciousness, while serving as a common point of reference for intellectuals, activists, and politicians concerned to explain the causes which gave rise to the event and its reverberations. It is frequently remarked that this moment in history marks the ascendance of a new ‘environmentalism,’ from the radical ecology of Rachel Carson, discussed in the previous chapter, to the neo-Malthusianism embraced by Paul Ehrlich’s *Population Bomb*, which targeted the fertility of poor people (Harper 2001: 353)¹². Less often noted, and arguably more pervasive, is the new global imagery which was simultaneously born, as Apollo 17 wired back widely disseminated photos of a seemingly fragile earth dominated not by the industriousness of human beings but by the physical and biological process of oceans, soils and clouds (Escobar 1996: 48). It was a powerful rebirth of *the* nature, or Nature; that is, the organic and physical objects and processes that make up *the* environment of human beings. And if there is anything consistent or coherent about the discourses of contemporary environmentalism – from the radical variants of ecology to the technocratic texts of sustainable development – it is their adherence to this global grid of intelligibility, encompassing an apparently vulnerable earth in its entirety, within which a monolithic Nature can achieve a remarkable degree of interconnectedness¹³.

¹² First published in 1968, Ehrlich’s neo-Malthusian work, which claimed that “the battle to feed all humanity is over,” has gone on to become the best-selling environmental book ever written. Over three million copies were sold in the first decade after its publication alone (Harper 2001: 353).

¹³ It is worth noting here that this global imagery has been rather uncritically adopted in some of the trendier paradigms of social theory, most notably ‘World Risk Society’ (Beck 1999) and ‘complexity theory’ (e.g. Urry 2000). Beck arguably represents the old guard, now, of this return to grand theory, and the critique of his programme is familiar and voluminous enough. Complexity theory is a more recent and enigmatic phenomenon, though it appears to be the “next big thing.” Prompting Thompson (2004) to ask: “Is all the world a complex network?”

Two insights are frequently drawn from Williams's piece, in an attempt to undermine the hegemony, or cultural dominance, of this metaphysical Nature and the knowledge that ratifies it. On the one hand, there is the argument that what nature means has a long and complex history. Rather than a singular Nature there are, in fact, multiple of ways of thinking about what nature is. Whether these natures are omnipotent or fragile, orderly or chaotic, encompass human nature or independent of human influence (i.e. wilderness), depends on the sort of inquiry and the portion of nature inquired into. Scientific knowledge is made relative. It matters what portion of nature is examined; the hydraulic cycle may be 'cyclical' and orderly over the long expanses of geological time in the lusty climes of the North Atlantic, where the language and concepts of Anglo-American ecology evolved; or the hydraulic 'cycle' may take on a kind of directionality, vacillating between years of fertility and years of relative sterility, as has been observed in the North American West (Davis 1998: 11-15). On the other hand, much of what is considered to be nature "has the same kind of history. It is the product of human design and human labour, and in admiring it as natural it matters very much whether we suppress that fact of labour or acknowledge it" (Williams 1980: 78). It is important because what nature means is intimately related to how people intend to try and reshape it, which necessarily entails reshaping the relations between people (79). An idealized nature is thereby undermined, from the Marxist perspective. The waterscape encountered in nature is the progeny of an extended interchange with human history. As Worster (1985) argues, the waterscape bears the scars of the struggles between classes, the privileged and the oppressed. Re-presenting this natural landscape as metaphysical, a primordial marker of the ideal order of things, is literally ideological; that is, a set of "ruling ideas [which] are

nothing more than the ideal expression of the dominant material relationships...grasped as ideas” (Marx and Engels 1968: 61). Marxist inspired approaches tend to favour the importance of the latter (e.g. Rudy 2005; Foster 2000), while theorists with anti-Enlightenment, post-development, or ‘romantic,’ sympathies find inspiration in the critique of scientific knowledge and the implicit vindication of local, subaltern natures, present in the former (e.g. Escobar 1999). Both have a certain resonance with the analytical history of water governance that I have in mind here. However, these insights have tended to send scholars off in opposite directions. As explained previously, Marxists strive to demystify the history of human labour and class struggle written into the natural landscape, while post-development theorists concentrate on locating the institutional and ideological affiliations of the various discursive articulations of nature. Each remains suspicious of the other. From the Marxist perspective, post-development theory is making a fetish of articulations and perpetuating the idealist nature of the bourgeoisie intellectuals. Marxism looks suspiciously like another global science of nature, from the perspective of post-development studies. Obviously, labour practices and scientific discourses have both served to constitute the modern waterscape and how it is understood. And I want to argue that common ground exists between these approaches in their mutual concern for the role played by the exercise of power in the history of water’s constitution.

Predictions of ‘water wars,’ in the sense of scarcity induced conflict, and even military warfare between sovereign states, usually in the Middle East, are all too familiar. Indeed many of the people I have discussed this project with were surprised to learn that water wars, in this conventional sense, would not figure prominently in its analyses. Coming

less than a decade after the Falkland Islands conflict, Gulf War One appeared to underline the political and economic importance of the Middle East and its non-renewable natural resources (i.e. oil), as well as a willingness on the part of certain industrialized states to deploy military force in order to achieve these strategically defined 'environmental' objectives (Glieck 1991: 84; cf. P. Smith 1991¹⁴). A logical interpretation of the First Gulf War might have emphasized, first, that militarily powerful states are increasingly anxious about securing access to the abundant oil resources of the Middle East (see, for example, Gowan 1999); and, second, that a pertinent environmental problem confronting the Middle East is the depleted uranium-laced military arsenal of countries like the United States and Britain. Because human rights violations, political and military violence are frequently related to efforts to control the flow of abundant petroleum resources, the *abundant* oil reserves of Middle East might have then been read as a sort of environmental curse (Dalby 2004: 5). Instead, the environmental security discourse of the 1990s was dominated by theories about how mounting water *scarcity* would place increasing stress on the regimes governing the region, creating the potential for civil strife, violent conflict and 'water wars.' In the urgent words of one typical foreign policy expert,

Even before the Gulf Crisis subsides, the United States, its allied partners, and the Soviet Union should actively encourage regional dialogue over contentious resource issues...A

¹⁴ Smith (1991) does not find the arguments which explain the Falkland Island conflict as motivated by geopolitical concerns (e.g. proximity to British Antarctic Territory and crucial shipping lanes) or economic concerns convincing: "it does not seem likely that the Falklands were regarded as a strategic or economic resource by the governments of Britain, but rather as a embarrassing encumbrance from the days of empire" (111). Instead, Smith argues that the war was analogous to a religious ritual, which tapped into and served to mould public "opinions, beliefs, attitudes, sentiments" in a manner that served to strengthen what had been a tenuous grip on power for Thatcher's conservative government. This interesting argument is accomplished with a semiotic reading of pro- and anti-war press releases. It is difficult to see, however, how this interpretation closes off other possible explanations, which might be found in other 'social realities,' produced by other texts. In any case, my point refers to how the Falklands conflict and first Gulf War were interpreted by the various factions of the international security establishment, and does not address the underlying realities that anticipated either event.

passive approach to Middle East water scarcity will doom any future peace initiative. Middle East hatred is bountiful but Middle East water is at the point of no return (Starr 1991: 36).

Working from a definition of security that includes any environmental issue – from global warming, to ozone depletion, and, in particular, pollution and natural resource degradation – which might reduce “quality of life and result in increased competition and tensions among subnational or national groups [which in] the more extreme cases...can lead to violent conflicts,” the burgeoning new interdisciplinary discourse of *environmental* security was born (Gleick 1993: 82). There was just one minor problem. Namely, “the actual history of armed water conflict is somewhat less dramatic than the water wars literature would lead one to believe: a total of seven incidents, in three of which no shots were fired. As near as we can find, *there has never been a single war fought over water*” (Wolf 1998: 255, emphasis in the original). In the face of this inconvenient historical reality, the discourse of environmental security increased the complexity of the independent variables used in its explanatory models, and the meaning of the dependent variable (i.e. tension, conflict, or insecurity) became more ambiguous.

The pinnacle of causal complexity and ambiguity was probably reached with the Environmental Change and Acute Conflict Project (ECACP). A comparative analysis of forty case studies in environmental security threats, steered by political scientist Thomas F. Homer-Dixon, and jointly funded by the University of Toronto and the American Academy of Arts and Sciences, ECACP is arguably the most theoretically and empirically influential global study of environmental security (Pesulo and Watts 2001: 11)¹⁵. Homer-Dixon acknowledges that there is little empirical evidence for “simple-

¹⁵ Pesulo and Watts argue that ECACP *and* the Environmental Conflicts Project (ENCOP), led by the Swiss political scientist Gunther Baechler, funded by the Swiss Government and the Swiss Peace Foundation,

scarcity conflicts between states,” which he attributes to the fact that “the very countries dependent on renewable resources, and which are therefore the most motivated to seize resources from their neighbours, also tend to be poor, which lessens their capacity for aggression” (Homer-Dixon 1994: 18,19). This refusal to count the wars initiated by the richest of nation-states as evidence of their resource dependence or the threat they pose to international security typifies mainstream environmental security discourse. Working from case studies of the Philippines, Haiti, South Africa, Peru, and Bangladesh, the basic assumptions set out in the ECACP explanatory models are also typical: within specific geopolitical boundaries water and other salient natural resources are scarce; economic and population growth and pollution further decrease the quantity and quality of resources; what is available tends to be distributed unequally; this ‘scarcity’ leads to migration, population expulsion, declines in economic productivity, rising ethnic tension, and so on, which weakens the institutional infrastructure of states, creating a political context in which “ethnic and deprivation conflicts” and “coups d’état” are more likely (31). Homer-Dixon and his colleagues are, therefore, able to conclude that their “research shows that environmental scarcity causes violent conflict. This conflict will be persistent, diffuse and sub-national. Its frequency will probably jump sharply in the next few decades as scarcities worsen in many parts of the world” (39).

The environmental security discourse of the ECACP is vulnerable to critique from multiple directions. As hinted at above, its wilful ignorance of the wars waged by the wealthy and the explicit characterization of poor nations as inherently irrational and prone to violence might be read as bald ethnic stereotyping, even racism. Perhaps more

have been the most influential (2001: 11). Because these studies are so similar, and the results published by Homer-Dixon more familiar to an Anglo-American audience, I will look at only ECACP to avoid unnecessary replication.

damaging, the conclusions are simply false when judged on their own terms. There is no empirical evidence of a causal link between water scarcity and violent conflict (Asmal 2000). Indeed, historical evidence appears to suggest the exact opposite; that is, water scarcity has been a catalyst for cooperation and peace (Wolf 1998). A more constructive critique though is offered by the Marxist-inspired critique of ECACP by scholars aligned with the political ecology (i.e. the political economy of ecological change) approach, which stands on three pillars. Homer-Dixon is criticized for not making environmental scarcity relative to capital accumulation, reducing the state to a monolithic abstraction, which is to say class struggle is not accounted for, and, finally, violence is narrowly defined in such a way that the full realities of people's environmental insecurity (e.g. vulnerability to harmful pollutants, lack of access to safe potable water) is not considered a 'violence' inflicted on some people by others (Pesulo and Watts 2001: 11-30). While mainstream environmental security should not be expected to take on the theoretical assumptions of the Marxist critique of political ecology any time soon, the last criticism is certainly useful. What I want to do here is suggest a way that the talk of 'water wars' can be criticized, in the context of the history of ideas of nature, as a set of discourses that attempt to extend particular projects of governing people and water through the creation of a particular way of understanding environmental scarcity and security. In fact, the effort to define the problem with water as one of a potential for scarcity induced conflicts is actually an example of strategically defining water problems in such a way that justifies further intervention into people's water and lives. These interventions both respond to and effect something we might call 'violence,' but perhaps greater analytical clarity is achieved by examining how the exercise of power is involved in the constitution

of realities where people are made to be vulnerable to harmful pollutants and lack access to safe potable water.

The manner in which the discourse of water wars is embedded in the exercise of power can be shown by examining its public policy recommendations. ECACP prescribes two streams of thought and action.

First, societies can continue to rely on their indigenous resources but [must] use them more sensibly...For example, economic incentives like increases in resource prices and taxes can reduce degradation and depletion by encouraging conservation, technological innovation, and resource substitution. Family planning and literacy campaigns can ease population-growth induced scarcity. Land redistribution and labour-intensive rural industries can relieve the effects of unequal access to good cropland.

Second, the country might “decouple” itself from dependence on its own depleted environment by producing goods and services that do not rely heavily on those resources; the country could then trade the products on the international market for the resources it no longer has at home (Homer-Dixon 1994: 16).

Happily, with Cold War tensions waning, this interpretation of the problem and its solution manages to justify the full panoply of neo-liberal development strategies for the so-called third-world under the apparently benevolent umbrella of intervention for the sake of environmental security (cf. Lemke 2001; Dalby 2002). The first set of recommendations involves establishing market mechanisms (i.e. prices) for natural resources, and tax breaks for corporations that would import more sensible and expensive technology. More familiar, neo-Malthusian answers are retained in the idea that family planning and literacy will help the ignorant poor to curb their primitive enthusiasm for reproduction. The second prescription resembles the standard ‘comparative advantage’ approach to economic development, which suggests that trade should be as free of tariffs as possible so that countries will be encouraged to rationally produce what they have in abundance and exchange it for what they need. How a state goes about “decoupling” itself from “dependence” on water is not entirely clear. What should now be apparent, however, is how wars over water involve the very definition of water and water problems

and who is empowered to make the definitions that will guide the way people seek to govern themselves, nature and others. The truth about water is not a fact ‘out there’ in nature, awaiting discovery or recovery, but an object of struggle and programs of government. The nature of water is socially contingent; it is an empirical question with a history. What is needed, therefore, is a philosophy of water that moves beyond reliance on a pre-defined natural essence.

III. Preliminary remarks toward a post-Natural philosophy of water

The remaining sections of this chapter attempt to tackle the philosophical dilemmas encountered by this attempt to formulate an anti-essentialist history of the ways in which water is constituted as an object to be governed. While ontological, epistemological and methodological assumptions become entangled in the actual practice of doing social research, each raises its own particular set of issues which will be discussed in turn. Since the aim here is not to make any startlingly original, or obscure, contribution to philosophy but merely to unpack some useful analytical tools, the best place to begin is with concise and uncontroversial definitions. According to Ian Hacking, ontology can be defined as the study of “what there is,” in general, from mundane material things to the soul and God. It is the study of what all manner of objects are, “and what makes it possible for them to come into being” (2002: 1). In short, ontology concerns what is. Epistemology refers to “*how we know what we know*” (Crotty 1998: 8, emphasis in the original). If truth and facts are ontological matters, then epistemology concerns knowledge and how we decide what counts as sufficient and appropriate knowledge about what there is. The term analytic is favoured over theory here because it is assumed that, in practice, the ontological and epistemological positions taken in this thesis cannot

be separated from its methodological orientation. In other words, the use of a particular method of describing or explaining social phenomena is always bound up with certain assumptions about what is necessary and what counts as sufficient for such an explanation or description. The chosen approach to a topic, or methodology, will tend to reveal the author's basic position on what the entity under examination is composed of, as well as how the pertinent knowledge about this composition is to be acquired (Malpas 2001: 125).

At the close of the previous chapter, a provisional methodology was sketched through which the question that has staged the central drama of the history of modern philosophy – that is, how does the subject come to know the object? – can be addressed. After Foucault, people come to know themselves and things by trying to govern them. This analytical ethos can be characterized as ‘genealogical.’ The ontology and epistemology of power (i.e. what power is and how we know) are intimately tied to relations of power. Truth is relative, locally, historically and socially contingent; it is that which is authorized as true. There is a dynamic tension between the poles of truth, knowledge and power. In a sense, power provides the architecture for knowledge, which confers truth that produces power (Foucault 1980: 93). I will elaborate upon the genealogical method in the final section of this chapter. For now it must suffice to note that it is important not to confuse philosophical relativism with moral relativism (e.g. Hacking 1999: 4)¹⁶. That is, it is not going to be argued here that there are no criteria through which good or bad truths can be sorted out from one another. To begin with, the parameters of the discussion need to be changed. It is necessary to “distinguish between one's normative position and the method of inquiry” (Hunt 1999: 416). This does not involve making a claim to

¹⁶ To this Hacking adds that neither should relativism be confused with historical revisionism (1999: 4).

objectivity or value-neutrality; I am resolutely in favour of the public ownership of water utilities in my own political constituency. This stance, however, does not endow a privileged source of insight into how water is being governed anymore than it provides a universal criterion by which one can tell others how they should or should not govern their water. Political convictions are a poor substitute for a research methodology. As Pierre Bourdieu wrote, it is wise to avoid the temptation to “use the science of the strategies that the different agents deploy to assure victory to their ‘truth’ in order to tell the truth of the game, and thus secure victory in the game for yourself” (1992: 259). I propose that the discursive constitution of water must be examined on its own terms. It will be argued, then, that whether water is considered sacred and holy, a universal right to which one is entitled by virtue of being born, or a colossally under-priced commodity that ought to be under the dictates of disparate capitals, is relative to the modes of knowledge that produce specific truths about water. It will also be argued that such regimes of knowledge are irrevocably tied to the specific institutions, social struggles, and efforts to shape the contours of the material and organic environment, within which they are articulated. A genealogical analysis traces the manifold lines of thought about, and intervention into, the nature of water – from agronomists, geographers, and geologists, to the agencies of the police and the officers of the military, up to the executive of government and down to the junior hydraulic engineer, between constitutional rights, sensationalist tabloids and do-it-yourself manuals – as well as their chance intersections, petty disputes, mutual animosity and broad couplings toward shifting goals.

An analytical history of water, or genealogy of water is concerned with the struggle to define what water is, what counts as knowledge about water, and what will be done with

the waterscape and, by extension, the people on it. The predictions of ‘water wars,’ in the sense with which we are all so familiar: open warfare between opposed nation-states, usually in the Middle East, has thus far out to be empty rhetoric (Asmal 2000). However, another less familiar struggle over water wages persists. In fact, as has been explored above, the effort to define the problem with water as one of a potential for scarcity induced conflicts is actually an example of strategically defining water problems in such a way that justifies further intervention into nature and the lives of living and breathing people. The very idea of such struggles implies that the natural sciences’ hegemony over the definition of nature has been loosened. And this raises the spectre of the “science wars” and its “intellectual armies,” to borrow a wry turn of phrase.

Thus this chapter will now proceed to a discussion of the science wars, so prophetically hinted at in the passage from Williams quoted above. The aim is to take from the disparate extremes of the science wars that which might be useful in analytical history of how water has come to be governed, contending that this must, obviously, include the role of science and technology. What is really at stake in the science wars is the tension between the reality and relativity of the objects ‘out there.’ The notion that water, objects, facts, and truth, are both real and relative is actually not as contradictory as it first appears. Rather than argue that the objects of science are ‘socially constructed,’ to use a loaded phrase, it will be proposed that scientific knowledge has a history and that this history has formed unstable linkages with projects of governance. After this brief account, a more complete ontology and epistemology of water will be proposed relying on a broadly defined concept of discourse. Finally, this philosophy of water is linked up with a genealogical methodology outlined in the work of Foucault.

IV. The science wars

The most logical place to enter the sprawling philosophical debate popularly known as the science wars is with that infamous event that galvanized the lay and scholarly imaginations. Although the “Sokal affair” raises issues of philosophical aesthetics, distrust, and obscurantism, which can be quickly dispensed with; it also hints at larger dilemmas lurking under the surface of the relative calm covering the philosophy of the social and natural sciences. In 1996, Alan D. Sokal published a silly and nonsensical article in the journal *Social Text*, a non-refereed journal known for its leftist politics and cutting-edge theoretical and cultural analyses. The article claimed,

in quantum gravity: the emerging branch of physics in which Heisenberg’s quantum mechanics and Einstein’s general relativity are at once synthesized and superseded. In quantum gravity, as we shall see, the space-time manifold ceases to exist as an objective physical reality; geometry becomes relational and contextual; and the foundational conceptual categories of prior science – among them, existence itself, - become problematized and relativized. This conceptual revolution, I will argue, has profound implications for the content of a future postmodern and liberatory science (Sokal 1996: 218).

At the same time, he revealed the hoax in an article published in *Lingua Franca* (Sokal 1996a). The paradoxical aim of the stunt was, apparently, to demonstrate the declining standards and academic integrity of the social sciences and humanities in America by publishing a fraudulent social study of science. Sokal argued that his article was published for two reasons. One, the editorial staff was flattered by and liked the conclusion that objectivity is ultimately relative; and, second, the spattering of footnotes and references to postmodernist philosophy and a similar use of scientific concepts for cultural analysis made the article appear hip or, at least, legitimate¹⁷. I have commented

¹⁷ French philosopher Gilles Deleuze and psychoanalyst Felix Guattari (1987:3-24), for example, make extensive and now famous use of ‘rhizome’ to describe the unseen interconnections which they perceive between people; whereas rhizome is typically found in botanical texts to describe the underground root systems of plants. I want to argue that, used sparingly and metaphorically, such borrowings are illustrative. Taken too far, however, and they appear as obscure attempts to lend scientific authority to one’s philosophical project.

extensively on the inner contradictions faced by the romantic retreat of postmodernism above, and so had the journal *Social Text* by the time Sokal's prank made it to publication. What is of greater interest here is the hint of the problems encountered by a radical questioning, or staunch defence, of the objectivity of social and human scientists and their methods that fuels the larger science war. It is against this backdrop that the Sokal affair captured the imagination of intellectuals, media outfits and the public alike.

Beginning in the late-1960s, an interdisciplinary project was launched organized loosely around an attempt to formulate a radical and critical sociology of scientific knowledge and technology (STS). The philosophers and social theorists attracted to this branch of STS inquiry focused on

what many thinkers have argued is profound crisis in the underlying conditions of modern life and thought. The development of modernity has gone badly wrong, not only at the level of specific, vexing social problems but in its fundamental core of ideas and institutions, especially those that involve science and technology (Winner 1996: 83).

The central thrust of their argument is that the objects of science and technology are social constructions. The trajectory of science and technology is, therefore, not inevitable but socially contingent; it can be altered; and, indeed, in many cases it ought to be. In this vein, the radical edge of the philosophers and theorists of STS “wish to *attack scientists hegemony on the definition of nature*, we have never wished to accept the essential source of their power: that is the very distribution of what is natural and what is social and the fixed allocation of ontological status that goes with it” (Callon and Latour 1992: 348, emphasis added). On the one hand, science and technology is ‘social’ because the direction of their research is steered by endowments, foundations, government grants and corporate funding, while, more concretely, science and technology are also produced by human beings who are positioned in social networks and take their cues and

metaphors from the culture within which they are immersed. On the other hand, the objects of science and technology are ‘constructs’ because their practices involve producing ideas, texts, and things which in a very real sense never existed before but were rather assembled – or, constructed – out of existing materials and theories (Nelkin 1996)¹⁸. In one ambitious account, science and technology ‘translate’ nature onto measuring devices, media reports, and journal articles which can serve to ‘enrol’ other scientists and lay persons in the definition of certain problems and programmes of action (Callon 1986). From the other direction, however, natural scientists and some philosophers and historians of science argue that there are important differences between ‘social constructs’ and the objects of scientific knowledge and technology. Quarks and tripeptides may have been ‘discovered’ by physics and biology but they were ‘constructed’ by biophysical processes which long pre-date the social. The knowledge of these objects is not merely ‘socially contingent.’ To the contrary, it can reasonably be said to resemble the truth of their nature because it is highly stable and the objects frequently ‘object’ to misguided attempts to come to know them (Hacking 1995). Moreover, far from just producing texts, enrolment devices, or ‘immutable mobiles,’ a major portion of scientific activity involves “interfering under controllable and isolatable conditions with matter and energy” (Hacking 1992: 37).

As in all great academic debates, important insights and trenchant hyperbole can be found in either of the intellectual armies engaged in the sciences wars. What I strive to do here is propose a modest truce by incorporating some of the less grandiose claims into the history of how science and technology have come to be implicated in the governance of water. That the qualifiers ‘just’ and ‘merely’ were required above, is an indication that

¹⁸ For a balanced and critical take these claims see the work of Ian Hacking (e.g. 1992, 1995).

the combatants are actually not as far apart as would appear. Much of the ammunition for the confusion that riddles the science wars can be traced to deliberately provocative exaggerations which tend to obfuscate more than they reveal. Latour's declarations, like "give me a laboratory and I will raise the world," inspire scholars to caution that we must not permit the sciences to turn the world into a laboratory (e.g. Beck 1999: 60). When Donna Haraway (1992: 296), moreover, proclaims that she "takes it as self-evident that 'science is culture,'" it is difficult to discern what exactly is self-evident. Why use the word science if it *is* culture, after all? In the process the social context that enables and constrains laboratory practices is muddled or ignored. Take, for instance, Latour's (e.g. 2000) bellicose claims that he does not rely on feeble, weak, and 'external' social factors for his explanations and descriptions of scientific practice. That Latour and Steven Woolgar changed the subtitle of *Laboratory Life* from "the social construction of scientific facts" to simply "the construction of scientific facts" has more to do with the harnessing of their "Actor-Network Theory" around strictly microsociological investigations (Hacking 1995: 365). Science is still very much socially constructed. This narrow focus on the micro scale of the social leads to empirically detailed studies of particular constructions. The problem is that there is a general failure to "account for the ways the world must be changed to allow facts to travel" (Schaffer 1991: 191). Rivalries between sciences, bacteriology and microbiology, and scientists, Koch and Pasteur, as well as between "republican and imperial regimes, [and] many different 'centres of calculation'" tend to be excluded from these micro studies (191). More polemically, "[Latour] attributes life to the inanimate, silences controversy, and asymmetrically credits his hero's stories while ignoring those of his hero's powerful rivals. Latour's deliberate

comparison of himself with Pasteur might license this comparison. Following this scientist so slavishly is not a good way of understanding him” (Schaffer 1991: 192).

At stake in this debate is the central drama of modern philosophy – how does the subject come to know the object – and, specifically, how much weight should be attributed to the reality of the object versus how much is assigned to the fact that the knowledge of the object is relative to a particular subject or epistemology. This latter proposition is often taken to involve a fatal contradiction for relativism because it seems to depend on the real existence of a subject (e.g. Kirk 1999: 43). And this would appear to lend credibility to the strong realist solution, which is at least as old as John Locke: namely, that objects have ‘secondary qualities’ like colours, sounds, tastes and smells, and ‘primary qualities’ like the power of fertilizer to induce plant growth (49). While the experience of secondary qualities is reliant on human knowledge and classificatory systems, the primary qualities exist independently of what is said about them. Nature is posited as an external object, which yields appropriate (secondary) knowledge about its (primary) composition when it is investigated carefully by a knowing subject in accordance with the scientific method. Though extracted from its social context in the sense that it refers only to the mental images of individual scientists, this philosophy of an external nature was conducive to an age when science was closely tied to the rise of manufacturing and industry. The scientific method functioned largely as “means for developing ‘mechanical arts,’” and the facilitation of labour processes through which human beings could act on nature as a machine to be manipulated (N. Smith 1984: 4, 5).

If seventeenth century philosophy concerned itself with how the knower knows the object, however, nineteenth century philosophy (i.e. modern philosophy) is concerned

with how public discourse (i.e. what is actually said) shapes our experience of reality (Hacking 1997: 165-181). Williams's 'ideas of nature' have been replaced by discourses on nature. This development can probably be attributed to the success of the scientific method and the organization of academic training, which has led to the proliferation of a multiplicity of ways of knowing while, at the same time, each discipline has reinforced a single way of seeing and, therefore, created its own specific version of reality: economics, for example, interprets everything through the lens of interlocking self-interest, physicists inhabit mathematical realities and biologists evolutionary ones, and for neurological chemistry people are "fundamentally controlled by the juices in their brain" (Collins and Yearly 1992: 301). Which is the 'primary' reality of water, its power to extinguish fire or its molecular composition of two highly combustible gases? The importance difference here is that the fiction of the knowing subject has been dispensed with; after Foucault, philosophy is no longer concerned with the interface between known and knower, *savoir*, or the nature of human understanding, but with the constitution of human knowledge, *connaissance*, and the accumulation of facts (Hacking 1997: 187). As Hacking laments, this shift from the idea to the sentences of a discourse is appropriate to an age when knowledge, if owned largely by corporations, nevertheless, has "gone public" (181). Of course, there is still a real world 'out there' but the West and the Orient, Nature and the social are now thoroughly conceptual terrains not places to which one can go; they are the topics of careers; they are realities which are ratified by biology, ecology and Eastern Studies, which "are discourses, not the living world itself" (Haraway 1992: 298).

The point here is that for modern philosophy there is no necessary contradiction between the realist ontological position (e.g. the argument that the natural sciences present a stable and, by and large, objective representation of the real world) and the relativist ontological position (e.g. the argument that science constructs facts which are relative to specific ways of knowing the world). In large part, the science war has been perpetuated by the tendency to formulate positions against straw-arguments – realism against idealism, relativism against absolutism – which no philosopher, at least since the idea-ism of Berkeley, actually holds (Hacking 1999: 24). A realist/relativist ontology of water can be successfully put forward if we take seriously the constructivist epistemological implications of the modern epoch. Marxist researchers have demonstrated that much of what we take to be natural landscape is the product of human labour. It is safe to assume with Hacking (1992) that science and technology have dramatically expanded their power to interfere with natural matter and energy. Though natural processes like the hydraulic cycle existed prior to human history they have since become intertwined with that history. As Latour and Callon (1992) have demonstrated, the very boundary between the natural and the human is the result of networks forged between scientists, government, and lay persons around specific definitions of problems which proscribe specific courses of action. Both of these arguments are consistent with the position that what water is – ontologically – and how we know what we know about water – that is, epistemologically – is constructed. These realms are nevertheless *real*, that is not ideal, insofar as they have an existence that is external to the human mind; however, people actively *construct* and inhabit a multiplicity of meaningful social and natural realities which are *relative* to the cultural and historical contingencies which

intersect upon particular localities. Realist and relativist ontological assumptions are hence deployed simultaneously. These constructions are not merely arbitrary, as the look at the water wars phenomenon illustrated, but rather intimately tied to the exercise of power and attempts to govern people and nature. Before linking the construction of water to relations of power, however, we need to unpack the notion of construction as an active, discursive and practical exercise.

V. Discourse after the linguistic turn

The purpose behind arguing that nature, trees, soil, water, and the like, are constituted as objects through discursive practices is not to suggest that water is not real; nor is to claim that it does not manifestly exist independently of what we might have to say about it. The aim here is to recognize, and emphasize the importance of a fact conceded by even the most strident of ecological activists: namely, that nature can only exist for us to the extent that our knowledge makes it intelligible (Kovel 2002: 89). The ontological solution to this impasse is to propose that there is no practical access to water independent of some form of knowledge – of what water *is* and is not, really; and all such knowledge is constituted through discourse. The argument being put forth here is in line with the central premise of the linguistic turn in social theory: there is no knowledge of events, people, things, and so on, that is not mediated through discourse. Following the linguistic turn, the Foucault-inspired epistemological prescriptions are used to the extent that they offer a way of recognizing our social and natural worlds as discursive constructs. The sets of interrelated utterances, statements, written texts and activities, which form a discourse are social and cultural; that is, rarely does language simply play the role of assigning a random label to some feature of an external reality. Instead, “to be

a woman, or a man, or a parent, etc. is not just a biological label, but it is encrusted with all the complex things that it means to be a woman, a man, or a parent in a particular culture at some particular point in time” (Hunt and Wickham 1994: 7).

Because language is shared, while exuding a considerable degree of local and temporal diversity, it provides social theorists with a tool through which social relations can be conceived of outside of those notorious totalities: ‘Society’ and ‘Nature’ (Purvis and Hunt 1993: 484). Discourses are the vectors for the communication of knowledge inside the myriad of networks on which social institutions are constructed. On the other hand, discourses do not travel in isolation and they take on broader cultural themes and metaphors from their social setting, not unlike the colonial representations and practices that make up the *Orientalism* understood by Edward W. Said (1979). The biological discourses authorized to represent primates, for example, have shed most of their explicitly racial, misogynist and colonial frames of reference. And yet

It is impossible to picture the entwined hand of a white woman and an African ape without evoking the history of racist iconography in biology and in European and [North] American popular culture. The animal hand is metonymically the individual chimpanzee, all threatened species, the third world, peoples of color, Africa, the ecologically endangered earth – all firmly within the realm of Nature (Haraway 1992: 308).

In sum, discourses provide the grid work through which people seek to both make-sense-of, and make-up, their social, biological, and physical realities.

Language is an important arena for the construction of these frameworks of meaning, but so are the many physical activities in which we engage, from gift giving, shaking hands, and opening doors – to a kiss on the cheek. Whether assembled in a series of statements or found in a set of actions, discourse is practical; it makes planes of reality like the community, the relationship, the social, the population or the economy thinkable and thus constitutes the spheres in which we seek to act (Rose 1993: 289). Discourses

articulate the diverse grids of understanding – the frameworks within which certain things can and cannot be thought, said and done – which indelibly shape how we come to act upon ourselves, others and the material world.

The expansive role herein assigned to discursive practices, indeed the very assertion that language might be practical, should not be confused with the idealist ontological position. Idealism posits no reality external to the mind and contends, therefore, that the evolution of ideas is the driving force of history. This trenchant idealism can be seen most vividly in the remarkably complex and intricate Hegelian philosophical system. For Hegel, “reason embraced the total universe; all of its realms, the inorganic as well as the organic, nature as well as society, were governed by the Idea and its dialectical logic” (Zeitlin 1981: 95). Of course, the Idea represents here the ‘level’ of human thought or consciousness, which is the thesis. At every stage the thesis is in a complex relationship with its contradictions, or antitheses, and the dialectic between them eventually brings about a qualitatively new synthesis, which progresses ever forward to the Truth, or the perfection of human thought and consciousness. The materialism of Marx is said to stand the philosophy of Hegel on its feet, as it were, because he located the dialectic in the forces and relations of production and thus in people’s material conditions of existence. As my research primarily concerns the relationship between the social and natural spheres, and water specifically, allow me to briefly illustrate the concept of discourse that is envisaged here with the following metaphor. Remember, against the neo-Hegelians, Marx famously argued:

Once upon a time a valiant fellow had the idea that men were drowned in water only because they were possessed with the *idea of gravity*. If they were to knock this notion out of their heads, say by stating it to be a superstition, a religious concept, they would be sublimely proof against any danger from water. His whole life he fought against the illusion of gravity, of whose harmful results all statistics brought him new and manifold

evidence. This honest fellow was the type of the new revolutionary philosophers in Germany (Marx and Engels 1968: 24, emphasis in the original).

If the materialism of Marxism concerns gravity then the concept of discourse employed by Foucault, and within the linguistic turn more generally, allows social theorists a way to maintain that gravity exists independent of our knowledge of it, whilst noting that without the discursive practices that constitute *swimming* – people would not be able to do much but drown. To concentrate on discourse is to focus upon the interrelated modes of thinking and acting that are assembled into the art of swimming and other such practices; it is to articulate a complex interweaving rather than a simple dichotomy between reality and the imagination, materialism and idealism, species and being. In other words, discourse analysis is a “social theory, a theory of the production of reality which includes the analysis of representations as social facts inseparable from what is commonly thought of as ‘material reality’...Discourse is the process through which reality inevitably comes into being” (Escobar 1996: 46). It is its articulation through discourse that determines whether, for example, water is known as sacred, holy, and imbued with the mystical power of the gods; an element of a hydraulic cycle through which it is circulated ceaselessly in and around the ecosystems of the world; a colossally under-priced commodity that ought to be under the dictates of disparate capitals; or, a universal right to which one ought to be entitled by virtue of being born.

While swimming is a helpful analogy, this paper is concerned with those discursive practices which are taken up by those who seek to configure the contours of the material and organic world and, in the process, shape the conduct of governing and govern the shape of conduct. Not all discourses are created equally. There must be a methodological prescription that allows us to differentiate between “the finance

ministry's attempts to have me pay my income tax, on pain of imprisonment, from my dentist's attempts to have me floss my teeth regularly, on pain of extraction" (Curtis 1995: 580). The ability to make this distinction has frequently been lost as governance comes to be conceived of as embedded in an array of interlocked ways of acting and thinking, and the typical realist categories of political sociology (e.g. the state and social classes) are abandoned (e.g. Rose and Miller 1992; cf. Curtis 1995). I want to propose here that the realities of governing – like physical coercion, the degradation of nature, violence, lying, conspiracies, statecraft and war – can be recovered by taking a critical look at the genealogical methodology of discourse analysis.

VI. Genealogy

The work of, and inspired by, Foucault takes the concept discourse as explored thus far and locates its analyses within a broad spectrum of the practices of the institutions of governance. It should be stressed that 'government' is conceived of from a Foucaultian perspective as considerably more expansive than that which is the object of the literature of sociology in the main. Governance is envisaged as the full panoply of ways of thinking about and acting upon oneself and others (Foucault 1994a: 225). This is accompanied by a rather embodied and decentred concept of power, which is thought to encompass an impressive array of strategies and devices used by and through people toward the optimal disposition of people (Foucault 1991a: 95). Foucault initiated an epistemic break with the dominate ways in which social thinkers had sought to know power. He rejected what he thought was an unfruitful economism of power (Foucault 1980: 89). Power is first placed at the service of the economy, in such approaches, which creates a circular argument in which power is both distributed by the economy and

destined to reproduce and maintain the relations necessary for the productive processes. Power is also, at the same time, fashioned after a commodity; it can be acquired, accumulated, transferred, exchanged, and by extension people can be alienated from, or outside, of power. Foucault, contrary to such assertions, argued that power does not primarily serve the economy nor is it surrendered or accumulated as a mere link in the chain of commodities. Rather power must be conceived of as that which is exercised, for it “only exists in action” (89). He thereby changes the questions that are to be asked of power. The problem is now to discern the how of power, that is, the mechanisms through which power is exercised. An ascending examination is required, beginning from its manifold points of application, for power exists in the minutiae relations of forces that are interwoven between bodies and the *meanings of words*. Instead of plugging people into disembodied systems of power, in this schematic people and *discourses* are the vehicles of power. Power is not merely that which says no; it not only repressive but also productive. Power is largely exercised by means of language and the discourses of the burgeoning disciplines and fields of knowledge that articulate the contested grids of understanding, which indelibly shape the conduct of governing and govern the shape of conduct.

While Foucault’s approach to discourse defies, quite purposefully, any attempt to harness a coherent and systematic method; it can be broken down into two distinct forms of analysis. From *Madness and Civilization* to the *Archaeology of Knowledge*, the preoccupation was on the rules and organizations governing the production of discourses. The *archaeological* method of Foucault organized discursive regimes hierarchically and focused in and amongst the ‘human sciences’ – from psychology and psychiatry, to the

various fields of medical practice, criminology and sociology. An archaeology of discourse aimed to unpack the manifold ways in which these ‘dubious’ knowledges regulated reason and non-reason, as well as claims of truth and falsity. The archaeological method, appropriately, sought to excavate the broader social conditions that permitted the formation of these discourses (Hunt and Wickham 1994). It was not Foucault’s contention that, for instance, psychiatry is somehow ‘bad,’ *per se*, but rather that its discourses were decidedly practical in that they sought to articulate both subjects and objects. He argued that discourses constituted *subject* positions, such as a doctor, from which thinkers could postulate certain diagnoses and recommend certain techniques of intervention upon the *object* of their thought, such as a patient, for the purposes of normalization, training, and so on. Therefore, with *Madness and Civilization*, Foucault aimed not to uncover the history of ‘madness.’ Instead, he sought to

write the history of that other form of madness, by which men, in an act of sovereign reason, confine their neighbours, and communicate and recognize each other through the merciless language of non-madness; to define the moment of this conspiracy before it was permanently established in the realm of truth (Foucault 1988: ix).

In the texts that attempt to provide the researchers of the social sciences and humanities with a map of the broad landscape of social philosophy from which practitioners currently draw, Foucault is often placed within the category of post-structuralism (e.g. Crotty 1998: 204). He rejected the label himself, of course. And, in his defence, *post* being merely a Latin prefix for *after*, such a classification is quite open to interpretation. Foucault aligned himself with *structuralism*, however, by arguing that the subject was discursively constituted. In his own words,

There was one point in common amongst those who in the last fifteen years were called “structuralists,” though they were not at all, with the exception of Levi-Strauss: I mean Althusser, Lacan, and myself. What was this essential point of convergence? It was a matter of calling this theme of the subject into question, once again, that great, fundamental

postulate which French philosophy, from Descartes until our own time, had never abandoned (Foucault 1991b: 56).

Foucault argued that there was not, in fact, a transcendental lens of interpretation through which people thought about and organized their actions upon themselves and others. The archaeological method was then an attempt to do a history of the history of the ways in which the discourses of the human sciences had constituted frames of reference with positions from which people could think about and act upon the objects of their thought.

It is with the subsequent genealogical turn though that the method of discourse analysis advocated by Foucault becomes, at once, more radical and influential. In common parlance, the term genealogy refers to the tracing of lineage, to the mapping of descendants through a family tree, and this is a useful metaphor. At each intersection there is a chance encounter. Perhaps this unforeseen event is followed by an accident or even a series of accidents, which in turn take off in unpredictable directions of their own, or maybe nothing comes of it and the lineage stops there. As the branches are traced back further they become muddy, obscured, and the lines must be traced through “documents that have been scratched over and recopied many times before” (Foucault 1994b: 369). Often this requires local memories, as there are but a few scattered official sources. A genealogy thus demands forbearance “and a knowledge of details, and it depends upon a vast accumulation of source material” (370). Contrary to the orderly strata of discourses found in archaeologies, the analysis found in genealogical works moves away from the explanations of origins and the moments of formation, and instead emphasizes the discontinuity and contingency of history. Previously, most ‘structuralism,’ such as the psychoanalysis of Lacan and the historical materialism of Althusser, had aimed to represent itself as ‘scientific.’ With genealogy, Foucault’s work

acquired the ‘post’ prefix of the post-structuralist categorization as it seen to exert a stronger relativism in its concern to attach the claims of science to the apparatuses of power. It is still, at least broadly, a history of the history of the modes of interpretation but the focus is now more explicitly on the tension between the poles of the triangle: power, knowledge and truth. Power is articulated in the discourses of knowledge, which distribute the truths that reproduce the imbalance of power.

This is most apparent in *Discipline and Punish*. The prison, argues Foucault, was not born out of efficiency; indeed, prisons were and continue to be horrendously expensive and of negligible economic utility. Salient though is how the prison comes to be used and the ends to which it is directed. A continuum of knowledge is articulated, discursively, able to coherently assess everything from a “transgression of the law to a slight departure from a rule” in relation to a norm, or an established average (Foucault 1995: 298). Sets of experts work to organize regulations which will ensure that each departure from these norms is punished and the very souls of people acted upon and through according to the proper quantities and qualities of institutional surveillance, supervision and coercion (299). The method of analysis attempted in Foucault’s genealogical works has inspired several notable masterpieces – Edward W. Said’s *Orientalism* (1979) and Arturo Escobar’s *Encountering Development: the Making and Unmaking of the Third-World* (1994) come to mind. The discourses that would form a grid of understanding over the Third World in the postwar period, argued Escobar, would be articulated by new and varied experts, who encountered new problems to which their knowledge spoke clearly: “poverty, insufficient technology or capital, rapid population growth, inadequate public services, archaic agricultural practices” (Escobar 1995: 41).

There were also more familiar problems to which their knowledge spoke “not so clearly, or cautiously: cultural attitudes, values, racial, religious, ethnic, geographic factors believed to be associated with backwardness” (159). In short, Escobar provocatively suggests that the real poverty and real suffering that real people experience was not possible before the massive interventions enabled and shaped by the discourses of development. While these manifestos are useful resources, the most sustained and prolific genealogical school of discourse analysis is arguably the decidedly modest approach called ‘governmentality.’

In the literature of the ‘analytics of government,’ as this perspective is otherwise known, the term ‘governmentality’ is used in two senses. In the first place, it represents a modality of power that governs ‘at a distance’ or ‘through freedom.’ Nikolas Rose (1999: 65) argues that the discourses of modern rule have recast living, breathing people as a population of resources to be cultivated, and that our freedoms or choices are steered through the organization of the norms and principles through which we experience our world and ourselves. Governmentality also refers to the analytic of this form of governance. This analytical approach seeks to uncover the spaces and identities that are constituted practically and discursively in order to be governed and how, the forms of knowledge and types of calculation, the authorities, expertise and apparatuses that arrange them, their strategies and tools of intervention, the goals that are sought as well as the methods of evaluation and reflection (Dean 1999: 20-39). In practice, the empirical material of the governmentality perspective is the archives of government: the planning documents and blueprints, their philosophical treatises, press releases, internal auditing procedures, and the like. These resources are analyzed for evidence of

discourses that indicate certain ways of reasoning and thinking, or *rationales*, which inform specific ways of acting or intervening upon people, or *technologies*. Researchers working within the analytics of government have examined the discursive strategies of the governance everything from crime and criminality (e.g. O'Malley 1992) to biotechnology and genetics (e.g. Novas and Rose 2000). Feminist scholars aligned with this approach to discourse analysis have increased the lines of inquiry significantly, and added a dimension of social critique to the school. For example, Kelly Hannah-Moffat (1999) has examined how the rights of female prisoners, which feminists had struggled for, have been recoded by governing discourses in order to subject women to more programmes of normalization and increase their responsibility for an array of procedures of self-care and regulation. Lorna Weir (1996), and more recently Lealle Ruhl (1999), have looked at the framework of governing discourses that surround pregnancy, and steer woman through a heavily moralized, often contradictory, series of quasi-scientific prescriptions and programmes of self-regulation.

Despite the new life that has been breathed into the analytics of governmentality with the recent contributions of politically engaged feminist scholars, I remain sceptical of its more trenchant applications. To begin with, there is an almost radical absence of any theorization of human agency (Hall 1995). Foucault certainly demonstrated that subjects and objects could be constituted through the articulation of shifting and historically contingent discourses. But he did not replace this destabilized subject with a concept that is remotely sufficient. In his later work on sexuality and ethics there is unfortunate dichotomy created between technologies of domination and technologies of the self (e.g. Foucault 1994a). Following this prescription, “[t]he agents that are active in accounts are

threefold: governments, experts and individuals. In their present form [the analytics of governmentality] provide little opportunity to incorporate the role of social movements” (Hunt 1999a: 217). There is frequent mention of the idea that the potential for resistance is actually enhanced by strategies that seek to ‘govern through freedom’ because what people are required to give they are likewise empowered to refuse (Rose 2000: 323). However, in the research it is hardly evident how such resistance is possible, and definitely not in the collective manner through which *social* change is enacted. And, by largely ignoring resistance, it becomes possible to present us with a remarkably consensual view of power, which “operates only by shared understandings secured by persuasion, negotiation and bargaining...and systematic domination and exploitation seem not to exist” (Curtis 1995: 577). Perhaps, this focus on ‘governing through freedom’ would be acceptable if not for the insistence on the inexorable connection between power, knowledge and truth. On the whole, I would argue that this is a drastic reduction of the exercise of power in contemporary societies.

This leads to the second major concern: the lack of an ontological stance in the post-structuralist approaches to discourse analysis. Genealogies are basically a method of organizing and constructing the history of modes of interpretation (i.e. epistemologies). This is why the discourse analysis inspired by post-structuralism appears to be quite modest in its endeavours. It takes no position on the ontological status of the grids of understanding it seeks to elucidate, aside from the occasional assertion that they are inherently ‘unstable’ and coupled to the relations of power and rule. In a sense, genealogies are neither relativist nor realist but rather practice a sort of irrealism or ontological ambivalence. There is nothing intrinsically wrong with such an approach, but

it is far from achieving the balance between relativism and realism sought here: research validity appears to be measured by the standard criteria by which we would assess any positivistically inclined historical piece. Indeed, Foucault proclaimed as much:

In the course of my works, I utilize methods that are part of the classic repertory: demonstration, proof by means of historical documentation, quoting other texts, referral to authoritative comments, the relationship between ideas and facts, the proposal of explanatory patterns, etc. There's nothing original in that. From this point of view, whatever I assert in my writing can be verified or refuted as in any other history book (Foucault 1991: 32)

This has led some scholars to charge genealogical discourse analysis with employing, rather ironically, a sort of “happy positivism” (e.g. Howarth 2000). This lack of ontological commitment, in combination with an intense focus on the rationales articulated in official texts and documents, “has led governmentality studies to be insensitive to social variation and social heterogeneity [and the failure to recognize not only]...the multiplicity of voices and discourses subject to government but not aligned with it, but equally to the multiplicity of voices within rule itself” (O'Malley and Weir *et al.* 1997: 505). Consequently, the strategies of government appear overly refined and coherent, and are further credited with a higher level of systemization and efficaciousness than such tactics are ever actually capable of achieving. Thus while the literature stresses, emphatically, that things could always be otherwise – it is not apparent how such change is ever to be accomplished.

VII. Conclusion: toward a genealogical recovery of ontology

There is significant controversy over the reason why genealogical analysis avoids ontological commitments. It begins with the observation that in Foucault's early studies there is a vague assertion of an underlying, metaphysical Nature. In particular, in *Folie et deraison*, the original work that was translated from French into the English *Madness and*

Civilization, there appears to be an ahistorical, “purer, truer madness” which lurks beneath the conspiracy of non-madness: psychiatry (Hacking 2002: 7). It must be recalled that Foucault’s early work rode the crest of the anti-psychiatry wave that propelled his and Erving Goffman’s *Asylums* to the height of intellectual and lay acclaim in the early 1960s (Hacking 2004). If Foucault was indeed asserting that there had always existed a purer and truer madness before it was registered as non-reason in an effort to classify, discipline and institutionalize masses of people, this would have been a popular and acceptable argument at the time. In any event, scholars sympathetic to Foucault’s work tend to suggest that “he renounced this romantic fantasy early on” (Hacking 2002: 7). Note the pejorative use of the word ‘romantic.’ The problem with this argument is that it is both accurate and pure speculation, depending on the portion of nature one selects. By the time of the release of the first volume of *History of Sexuality* (1990 [1978]), certainly, Foucault is no longer arguing that there is a purer and truer set of sexual practices buried beneath the discourses of the modern human sciences. The entire point of the introduction to this work is rather that the idea that there is truer and purer sexuality to be recovered is an idea unique to, and invented by, the very same modern discourses. The ‘romantic retreat’ into Nature is replaced by the exercise of power over the self and others, which is linked to the constitution of human natures, the body, and sexuality.

However, while this new – genealogical – direction taken in Foucault’s work has “clear implications for the natural sciences” he resolutely avoids exploring these linkages between these more epistemologically secure modes of inquiry and the constitution of the

organic and material world (Vogel 1996: 183, 184). In arguably his most cogent explanation, Foucault claims,

For me it was a matter of saying this: if, concerning a science like theoretical physics or organic chemistry, one poses the problem of its relations with the political and economic structures of society, isn't one posing an excessively complicated question? Doesn't this set the threshold of possible explanations impossibly high? But, on the other hand, if one takes a form of knowledge (*savoir*) like psychiatry, won't the question be much easier to resolve, since the epistemological profile of psychiatry is a low one and psychiatric practice is linked with a whole range of institutions, economic requirements and political issues of social regulation? Couldn't the interweaving of effects of power and knowledge be grasped with greater certainty in the case of a science as 'dubious' as psychiatry? (Foucault 1980a: 109, 110).

Hence, whether or not Foucault entirely renounced the romanticism inherent in his early work is conjecture, and it is more accurate to suggest that he closed off certain natural realms that posed a problem to the epistemological critique that characterizes his genealogical project. So while it is possible to read Foucault as a realist/relativist when it comes to the power exercised by the human sciences, which are clearly thought to engage in the constitution of social relations, techniques of the body, and the formation of the state (e.g. Hunt and Wickham 1994; Curtis 1995; Weir 1996; Ruhl 1999), this is more difficult when the concern turns to material and organic natures. But, perhaps, the problem is less intrinsic to the genealogical method than rooted in the manner in which Foucault poses his questions. That is why this chapter began with a look at the intersecting political, economic, ethnic and natural scientific effects unleashed by the discourse of environmental security and the problematic of 'water wars.' When one begins with the ontological status of the objects of the natural sciences, the entire enterprise does appear to have an intimidating level of 'objectivity.' But as the science wars have made apparent, the very boundary between the natural and the social that upholds this objectivity rests upon moral claims and political connections which have themselves been made the object of struggle.

If, instead, we begin with Williams's assumption that ideas (or discourses) of nature, "No longer can struggles over nature proceed as if nature were a self-evident entity" (Braun 2002: 17). We are thus in a position to add the methodological prescription "that what counts as nature is an effect of multiple histories and practices, [thus] taking nature as commonsense risks concealing and reinforcing the relations of power that are constitutive of, and internalized within, nature's historical forms of legibility" (17). The ontological reality of nature is rescued, therefore, by making it historically relative to the discourses and practices that have constituted it. To investigate the governance of nature, then, is to take Foucault up on the opportunity he refused to pursue; that is, how have the rationalities and technologies of modern government constituted the *qualities* and changed the very *essence* of its territory, and, in this case, its waterscape (Braun 2000: 12). It is toward these, in many cases, still unanswered and open questions that the remainder of this thesis will be directed.

Chapter three: the invention of water in social theory

I am not unaware that many men have believed and still believe that the affairs of the world are controlled by fortune and by God in such a way that the prudence of men cannot manage them, and indeed cannot improve them at all. For this reason they are inclined to think that there is no point in sweating too much over these matters and that they should submit to chance instead. As a consequence of the great changes, exceeding human expectation, that have been seen and are still be seen daily, this opinion has had wider acceptance in our day than heretofore. Thinking about it, I myself have sometimes been inclined to concur with this judgement in some measure.

Nevertheless, since our free will must not be denied, I estimate that even if fortune is the arbitrator of half our actions, she still allows us to control the other half, or thereabouts. I compare fortune to one of those torrential rivers which, when enraged, inundates the lowlands, tears down trees and buildings, and washes out the land from one bank to deposit on the other. Everyone flees before it; everyone yields to its assaults without being able to offer it any resistance. Even though it behaves this way, however, it does not mean that men cannot make provision during periods of calm by erecting levees and dikes to channel the rising waters when they come, or at least restrain their fury and danger.

The same may be said about fortune, which tends to show her strength where no resources are employed to check her. She turns her course toward those points where she knows there are no levees and dikes to restrain her...Let it suffice to have said this much about opposition to fortune in general.

- Niccolo Machiavelli, 1513¹⁹

I. The mother of invention

This chapter will provide a genealogy of the prevailing approach to water in social theory. From stories of creation and evolution to apocalyptic floods and the discovery of new worlds, the inexorably interwoven histories of people and water have inspired a voluminous textual record of proverbs, literature, poetry, and scientific endeavour. It is a corpus best, and perhaps inevitably, entered from somewhere off-centre. The “great changes” to which Machiavelli makes reference are, of course, occurring in Italy and, specifically, in his native Florence. It is neither geopolitical chance nor misfortunate environmental circumstances which have brought her under the sway of neighbouring sovereigns, Germany, France and Spain, but rather the failure to prepare appropriate

¹⁹ Machiavelli, Niccolo (1966) [1513] *The Prince* (translated and edited by Daniel Donno). Toronto: Bantam, 84-85.

defences and the inability to take on bold offences (1966 [1513]: 84-87). The governance of water is used as a familiar metaphor for the exercise of power in general, which he envisions as the act of carving out a link between a ruler and an independent political terrain from the vicissitudes of chance, nature, and the wills of other men. The central thrust of my argument will be that, in the course of developing a theoretical understanding of contemporary water problems, the study of water in the annals of critical social thought has directly reversed what was so obviously the order of things in the metaphorical refrain of Machiavelli; namely, what appears to be the nature of water is actually the product of, at least, 10,000 years of inventions in knowledge and technology and governance. Instead, within social theory it appears “that human beings were invented by water as a device for transporting itself from one place to another,” as Tom Robbins once mocked, sardonically, in a fictional context (1991: 11). This reversal has a corollary. It would be logical to assume that at the dawn of the Neolithic Revolution the powers of governance, knowledge and technology were considerably lower than they are at present; and, therefore, nascent human civilizations were in all likelihood highly fortunate in their ‘choice’ of environs. In practice, archaeological excavations are guided by an axiom that would seem to confirm this hypothesis - if there is water inside of 300 metres the potential of the site has been established. Scrutinized more closely, the generous and abundant circumstances within which ancient civilizations like Egypt and China found themselves also provided them with the chance to rebound from countless famines, plagues, revolts and rebellions (Wright 2004: 105). And, as Marc Reisner (1993) has explored in great historiographic detail, modern civilizations have also been the beneficiaries of encountered abundance: the extraordinary hydroelectric capacity of

the North American West along with the irrigation reaped from its colossal Ogallala groundwater reservoir, to name only two obvious examples. In the main, however, water theorists have resisted weakening the necessity behind their casual explanations by taking an environment of plenty as a point of departure. The place where water theory does begin – with questions concerning the allocation of scarce resources – provides considerable evidence to suggest that its origins lie in classical political economy.

Toward the close of the twentieth century a shift can be observed after which the government of water is no longer discussed as a strictly technical matter of delivering on availability. An impressive array of experts are now employed in steering public discourse and shaping the “social meaning” of water, in an effort to alleviate a range of problems, from potable water quality and the equity of access, to infrastructure efficiency and ecosystem integrity (Graffy 2006). Concurrently, there are edited readers for students of the humanities and social sciences with an interest in the burgeoning literature on people’s water problems (e.g. Johnston and Donahue 1998). As discussed in the previous chapter, the hegemonic definition of these problems comes from the interdisciplinary discourses of environmental security and neo-liberal economics. From this perspective, security is to be protected from threats to “quality of life,” which have come to include potentially harmful environmental events like global warming, ozone depletion and the degradation of natural resources like water. Increased water ‘scarcity’ is then connected with ‘security’ through a multitude of intervening variables, from population expulsion to declines in economic productivity and violent conflict at sub-national and national scales. Neo-liberal development strategies and structural adjustments are then offered in order to make competition over scarce natural resources

more rational and to preserve environmental security (Homer-Dixon 1994; Gleik 1993; cf. Dalby 2002; Wolf 1998). That this definition of the problem enables and legitimates the governance of certain people and water by others, and fails to account for the insecurity such strategies have historically inflicted, has already been discussed. The purpose here is to explain the limitations inherent in the other two pillars of the radical Marxist critique of environmental security and water governance, which raises, first, the failure of mainstream environmental security to make scarcity relative to capital accumulation and, second, the expulsion of class struggle and the reduction of the state to an abstraction (Pesulo and Watts 2001: 11-30). It will be argued that, by articulating their criticism in this way, critical social theorists have contributed to, and even accentuated, an interpretation of the water problem that relies on economic frames of reference, explanation, and prescription.

The understanding of water found in contemporary critical social theory has served to resuscitate a hypothesis developed by nineteenth century political economy, with its “train of ancient and venerable prejudices and opinions,” about pre-modern civilization²⁰. This approach will be called hereafter the ‘state-hydraulic hypothesis’, in the absence of any recognized consensus on terminology²¹. As the name suggests, the state-hydraulic

²⁰ The quoted passage is, of course, from the *Communist Manifesto* (Marx and Engels 1955[1848]: 13). To a considerable degree, contemporary social theory on water can be seen as an extended dialogue and a series of attempts to systematize classical nineteenth century thought on the subject, which is, arguably, represented most famously and articulately in the references made to water in the journalism of Karl Marx (see, for example, Wittfogel 1957: 374); thus transforming a series of prejudicial remarks on the Orient, considered an ideological embarrassment to Marxist scholars (Turner 1978: 3), into an argument resembling a theoretical hypothesis. Too optimistic in the *Manifesto*, perhaps, Marx came closer to the order of things when he wrote, “The tradition of all past generations weighs like a nightmare upon the brain of the living” (Marx 1955 [1852]: 48).

²¹ To illustrate, briefly, the range of terms used, Wittfogel seems to prefer the sweeping phrase ‘hydraulic society,’ but also makes use of everything from ‘agro-hydraulic world’ (1970: 2) to ‘hydraulic civilization’ (1957: 50), and goes so far as to claim that he “has no hesitancy in employing the traditional designations ‘Oriental society’ and ‘Asiatic society’ as synonyms for ‘hydraulic society’ and ‘agromanageial society’

hypothesis attempts to explain the character of a particular institutional formation, the *state*, through historical analyses of the technological harnessing of the power of water, e.g. irrigation, canals, and dams, or simply: *hydraulics*. Its primary contention is that the more ambitious regimes of water management require a social hierarchy in which those who control the water infrastructure wield extraordinary power over the great mass of people who must have access to the water.

The lineage of the state-hydraulic hypothesis will be traced from the synthesis forged by Karl A. Wittfogel from nineteenth century classical social theory, to the revisionist environmental historian Donald Worster, and their influence upon the political ecology of the Oxford School. The nature of the former connection is the most straightforward to assess, as Worster has engaged in a relatively lengthy and explicit dialogue with what he judges to be Wittfogel's contribution to environmental history (Worster 1985: 23-49). The influence of these two intellectuals upon the latter school is less easily measured. Esteban Castro, Karen Bakker, David Harvey, Maria Kaika, Ben Page and Erik Swyngedouw are among the main scholars working on the problem of water, presently or previously affiliated with the school of geography and the environment at St. Peter's College, Oxford (Swyngedouw 2004). To my knowledge, no one has gone so far as to call this group the 'Oxford School' but the authors do share a distinctive and influential theoretical understanding. The variant of 'political ecology' to which they subscribe can be concisely defined as a political economy of socio-environmental change (Bakker 2003a). And the most important water theorists from the perspective of this (critique of)

(1957: 8). In any case, 'state-hydraulic' captures just as well the social and natural empirical terrain and arguably better the style and objectives of the analyses.

political ecology are Wittfogel and Worster (O'Connor 1998: 117, see also Swyngedouw 2004: 35).

II. The nature of power and the power of nature

The reservation that will subsequently be raised against this water theory literature concerns its employment of an economic and repressive concept of power. This critical discussion will be guided by Foucault's critique of liberal and Marxist discourses on power. Liberalism envisions the progressive replacement of the arbitrary tyranny of monarchic rule with rationally determined legal rights, which alone can ensure the legitimate exercise of authority (Hunt 1990). Whereas, in the Marxist account, power emanates from those relations people enter into outside of their own will, with each other and the material implements of economic production; that is, power, the state, and its legal apparatuses, are ultimately built on the foundation of the economy (Marx 1971 [1859]: 17-23). According to Foucault (1980: 78-108), these otherwise disparate narratives share an economism of power. On the one hand, power is fashioned after a commodity: it can be acquired, accumulated, or exchanged as a right or, in the Marxist approach, as a resource. This facilitates another form of economism, in which power can reside in or be possessed by a single and centralized source, such as the economy or the state, the capitalist class, a despot, or the people (Lemke 2002: 51).

Now, as the theoretical development of the state-hydraulic hypothesis has been initiated almost exclusively by scholars with Marxist sympathies, the focus on the economic dimensions of social power should not be surprising. Worster, for example, was characterized in the opening chapter as typical of the Faustian approach to the social history of water. The danger I wish to avoid here, then, is making merely the banal

observation that Marxists fail to share a Foucaultian concept of power. It will be demonstrated that the approach to water in critical social theory is not without considerable merit and nuance. While the observation that ambitious projects require large-scale organization is a less interesting truism (Toynbee 1958: 198), this literature has also made important contributions to our understanding of how social practices, struggles and power are registered in the material artefacts of water storage and distribution. The difficulty with the economic line of inquiry is encountered when questions turn to what power actually, in effect, does. Analyses always return with the same answer: “power is essentially that which represses. Power represses nature, the instincts, a class, and individuals” (Foucault 1980: 89, 90). It is utterly impossible, however, when thinking strictly in terms of repression, to grasp the mechanisms of power that “beginning in the eighteenth century, took charge of men’s existence, men as living bodies” for the purposes of control, discipline, and normalization (Foucault 1990: 89). Modern power cannot be uncovered at the apex of a pyramid, in a disembodied state or economy; nor can it be traced to the decisions or intentions of lords, mandarins, or superior elite. An ascending examination is required, for the exercise of power is to be found in the minutiae of relations of forces, the mundane artefacts of everyday life, human bodies and the meanings of words. People, things and discourses are not the manifestation of power but rather the “element[s] of its articulation...individuals are the vehicles of power” (Foucault 1980: 98). In other words, “power is always something which some people do intentionally to other people and most people will do it at some time in some context” (Waters 2000: 231). The questions are thus changed to *how* power is exercised and to what effects are *produced* by its articulation, both of which are

empirical, that is to say, 'open' questions to be answered not hypo-deductively but with careful historical research. Although, in the final analysis, retaining certain elements of the standard Marxist approach to power is probably desirable.

It will not be argued that scholars applying the state-hydraulic hypothesis have drawn false conclusions. Foucault's critique of power will be used only to raise a series of doubts against the sufficiency and necessity of the narrative found in critical social theory on water. First, by concentrating on the actual exercise of power instead of its evidence in certain structures like dams, and so on, the Foucaultian approach has the capacity to reduce the tendency toward anachronism – that is, the attribution of powers of knowledge, technology and governance to socio-historical contexts in which they did not exist – which plagues the state-hydraulic model²². Second, the ascending mode of analysis fruitfully allows the historical examination to escape the simple dichotomy erected between the heroic victims and the agents of conspiracy, mandarins, capitalists, despots, or whatever. While the contemporary use of the state-hydraulic hypothesis has shed much of its early anachronistic tendencies, the power attributed to the state and bureaucracies in the environmental history of the American West written by Donald Worster (1985), for example, is at best an oversimplification and at worst entirely spurious (cf. Sheridan 1998; Pisani 1996).

Third, the Foucaultian critique loosens the tight dialectic between environmental change and the economy found in Marxist accounts. The irrevocable entanglement of water governance and the economy does not necessarily mean that, for instance, dams,

²² Michael Mann (1986: 94-115) provides the most comprehensive and compelling critique of these anachronistic tendencies in the state-hydraulic hypothesis. His own work, however, arguably falls into another familiar trap of reliance upon 'intentions,' and, specifically, people's desire to pursue the good things in life, which appears more closely resemble the spirit of the constitution of the United States of America, and the ideals of liberalism, than it does a sound theoretical principle.

canals and the like, are born out of economic efficiency or that their failure to be profitable indicates a fatal contradiction for capitalism. Historical evidence suggests that, analogous to the prison, “true cost accounting for dams almost always shows the bottom line in red” (De Villiers 1999: 154). As argued in the previous chapters, the governance of water can be linked up with various strategies for shaping the conduct of people and the contours of nature, from environmental security to the nationalist agendas found in the Canadian Northwest, which may only have vague and contingent connections to economic objectives. The advantage behind the Marxist approach, however, lies in its attention to the material architecture or structure of power, which is assumed but not developed in Foucault’s critique. Lost in translation is *puvoir*, and the late Foucault draws up a concept of power synonymous with *force*: analogous to gravity or wind; it weighs upon, pushes, and manipulates people yet it is most effective because it is a relation between diffuse objects and subjects, impossible to pinpoint with any certainty. This radically decentralized and embodied concept of power is not without its costs. Governance spreads out before us with a vastness comparable to paved jungle of the American interstate highway system. However, in a manner more closely resembling the genesis of the hyperlinked matrix of cyberspace – no map is provided. Where are the major intersections, the central nodes, and main arteries of power? On which roads are struggles to block and resist the flow of power? Foucault illustrates well the immanence of power but provides an *aspatial* and *self-sustaining* alternative (Allen 2003: 65-91). The attention of Marxism to the political and economic processes which have constructed the landscape of water, or waterscape, as part of the built environment of production and consumption allow for a partial recovery of the geographical arrangement of power

(Swyngedouw 1999). While the reincorporation of the ontological realities of water²³ allows for a less ephemeral concept of power, retaining the idea that there are things, people and relations which are particularly *powerful*, as evidenced by silences and the silenced, the things which are not said and done: the power which need not be exercised. However important these realities might be, in the final analysis it is through discursive practices that material circumstances are constituted as abundant or scarce. The government of water is an invention of people, their knowledge, struggles and strategies; it is not born out of necessity, and can and has been exercised otherwise.

III. Deserts in the Orient

Anyone who accuses Marx of having neglected the primary and given facts of nature may perhaps have read too little Marx. But it is for certain that he read him incorrectly, that he did not grasp the essential difference between Marx's conception and all bourgeois methods of reasoning.

- Karl A. Wittfogel, 1929²⁴

Behind the state-hydraulic hypothesis of Karl A. Wittfogel stands Karl Marx. Wittfogel was unequivocal about finding the inspiration for his theoretical ideas in the American journalism of Marx. Of particular importance are two articles published in 1853 in the New York Daily Tribune in which “Marx discussed the character of Asiatic society and the possibilities of its progressive dissolution” (Wittfogel 1957: 374). The Orientalism that characterizes the remarks made in the American journalism of Marx and Engels on

²³ For instance, independent of its constitution in discourse, it is a ‘reality’ that humans need two and a half litres of water per day in order to subsist. A portion of this water is made through the body’s metabolic processes but the vast majority, 88.5 per cent, must be acquired from the fluids and food that people eat and drink (Suzuki 1997: 60).

²⁴ This passage comes from a lengthy essay written early in Wittfogel’s academic career (Wittfogel 1985[1929]: 53, emphasis in the original). The essay is constructively critical of Marxism, siding on the side of a ‘scientific’ historical materialism of nature and society, anticipating the green Marxism that emerged in the late 1970s, which no doubt contributed to its recent republication and favorable review in *Antipode*, a journal of radical geography. The focus of the essay’s more polemical moments is continental geopolitics, and it was originally published in a mainstream organ of the nascent science of German geopolitics (Peet 1985).

the Middle East and Asia has become an “ideological embarrassment” for Marxists. Oriental civilization is presented as stuck in pre-history, classless, and static due to excessive interference in the economy from the central government. The Orient’s decline is conceived of as inevitable in the face of capitalist imperialism, organized around liberalism and ‘voluntary association,’ can therefore be seen as a progressive development.

What we call its history is but the history of the successive intruders who founded their empires on the passive basis of that unresisting and unchanging society. The question is not whether the English had a right to conquer India, but whether we are to prefer India conquered by the Turk, by the Persian, by the Russian, to India conquered by the Briton.

England has to fulfill a double mission in India, one destructive, the other regenerating: the annihilation of old Asiatic society, and the laying of the material foundations of Western society in Asia (Marx 1966 [1853]: 103).

Taken out of context such statements reek of a kind of pragmatic liberalism, typical of scholars like Michael Ignatieff (2000), and hideously unfashionable from the perspective of current Marxist discourse²⁵. Louis Althusser, most famously, was able to use a semiotic reading of certain key texts to arrive at the *true* Marxism (i.e. the science of dialectical materialism) as opposed to the false Marxism (i.e. anthropological, humanist,

²⁵ Despite the obvious differences between the liberal and Marxist narrative, it is worth illustrating the startling similarities between Marx’s idea of the unfreedom of the Orient and that of liberal adherents, such as J.S. Mill. Marx had a penultimate view of liberal democracy and capitalism; it was not the final destination of humanity, but it certainly represented a measure of progress over “idiocy of rural life” and despotism. For J.S. Mill the central problems confronting the modernity are interpreted in terms of delimiting the boundaries of the legitimate and illegitimate exercise of power, and the related search for the class of people who might justifiably exercise such authority. Mill’s laconic remarks on the latter problem are instructive about the essence of the programme of liberalism. If people cultivated their natural endowment of reason through education, they would gain knowledge of the true principles by which the world ought to be governed through their experiences (Shields 1958: xxviii). Appropriately self-critical and self-satisfied, of course, the West had apparently travelled the furthest toward this ideal. Speaking of the outlying territories of nineteenth century European empires, for instance, Mill suggested that they “may be divided into two classes. Some are composed of people of similar civilization to the ruling country, capable of, and ripe for, representative government: such as the British possessions in America and Australia. Others, like India, are still a great distance from that state” (Mill 1958 [1861]: 250). The liberal vision, however, particularly in its compulsion for ‘free education,’ was also emphatic about the universality of the road to modernity; that is, although liberalism denigrated certain peoples to a position below the requisites of self-government, the requisites were attached to the “general degree of advancement” of right reason which was, at least theoretically, attainable by all (Mill 1958 [1861]: 56-67); and therein lay much of its appeal.

idealist, etc.). Happily, the journalistic pieces were inconsistent with the true Marxism (Turner 1978: 3-5; Waters 2000: 115-122). It is interesting that both Althusser and Wittfogel were both able to arrive at opposed yet 'scientific' and somehow 'correct' readings of Marx. Fortunately, this review aims only to trace the ideas of Marx and the employment of, and critical dialogue with, his concepts. This daunting notion of a true reading can be safely set aside.

In that vein, contrary to Althusser, I propose only that the assertions made in the journalism of Marx about water and the Orient have proven to be highly durable and influential. The reason for this influence is arguably the fact that his theories about water permeate the broader corpus of his work, and are not particularly original. Thus in *Capital* Marx could write, without referencing a single source, that

One of the material foundations of the power of the state over the small and unconnected producing organisms of India was the regulation of the water supply. Its Mohammedan rulers understood this better than their English successors. It is sufficient to recall the famine of 1866, which cost the lives more than a million Hindus in the district of Orissa, in the Bengal Presidency (1976: 650).

Several recurring themes emerge in this quote around which the discussion of Marx's contribution to the state-hydraulic hypothesis can be organized. In the first place, that the people of the Orient are less free than those of Europe, and that this rule is facilitated by the regulation of water, is considered to be obvious and in need of no great argument. Rather Marx uses this common knowledge to make other more contentious claims.

One of these arguments concerns the character of the dialectic between social and natural spheres, or the 'hydraulics.' His description of Indian producers as "organisms" provides a clue as to the thesis of Marx that the relationship of pre-capitalist people to their natural circumstances was somewhat below the "metabolic activity" attributed to capitalist production; that is, the invention of large-scale water manipulation was

necessitated by the encountered environment. And the capitalist metabolism is, in turn, somewhat below the “material praxis” that would be initiated by socialism. British imperialism is consistently portrayed as incapable of taking on the long-term planning and coordination required to sustain the large-scale water works encountered in the colonial possessions of the Orient. Capitalist imperialism is accomplished not by sword or the purposes to be served to the Empire, but rather through the almost *imperceptible* and *unintentional* changes wrought by “English steam” and “English free trade” (Marx 1966a: 99). It is these slow mutations in metabolic activity that lead to the precipitous fall of the ancient Oriental social order and the “only social revolution ever heard of in Asia” (99).

The political unity of India, more consolidated and extending further than it ever did under the Great Moguls, was the first condition of its regeneration. That unity, imposed by the British sword, will now be strengthened and perpetuated by the electric telegraph. The native army, organized and trained by the British drill sergeant, was the sine qua non of Indian self-emancipation, and of India ceasing to be the prey of the first foreign intruder. The free press, introduced for the first time by the common offspring of Hindus and Europeans, is a new and powerful agent of reconstruction (Marx 1966 [1853]: 104).

There is a clear teleology at work in Marx’s Asiatic mode of production (i.e. the forces of labour, organizational and technical knowledge that are linked to the social institutions which decide how labour will be combined and wealth distributed in any given socio-economic formation), which provides the framework for his socio-natural dialectic here (Habermas 1975: 287-291). The philosophical milieu of the North Atlantic in the nineteenth century was a time and place suffused with a tremendous optimism about the virtue and inevitability of human progress (Wallerstein 2000: 26). This confidence was, no doubt, intricately tied to a particular experience of the present as ‘modernity’. Everyday life was swept up in a maelstrom of perpetual flux - scientific discovery, industrial revolution and social upheaval – while, at once, suffused with the memory of

“what it was like to live, materially and spiritually, in worlds that are not modern at all” (Berman 1982: 17). Underemphasized in the contribution of Said, I think, is the manner in which a temporal boundary coalesced with the geographical one in the imagination of nineteenth century social scientists. Said stressed how Orientalism is prone to vacillate between representing the East as radically static, “fundamentally, even ontological stable,” and as formerly impressive, perhaps, observed now in all “the wretchedness of their decline” (Said 1978: 32, 35). However, for Marx, the forces unleashed by capitalism will be irresistible the world over. He carves up into modern and *pre*-modern realms, an act that is only comprehensible if time is envisaged as linear; and so conceived, historical progression is inexorable. The movement of specific regions can be plotted along a common path toward a relatively universal end-state. It is the narrow trajectory of socio-natural relations, which provides the dialectical movement of historical materialism with its quintessential orientation. And while Marx “died in 1883 – more than a century ago – confident of capitalism’s essential transitoriness” (Sayer 1991: 4), the dilemmas encountered by more pessimistic contemporary followers have illustrated well the dangers inherent in tracing the impetus of environmental change to irresistible economic processes. Namely, the economism of the power makes a fetish out of natural necessity, and the lack of water is turned into the mother of invention.

In order, therefore, to find an analogy we must take flight into the misty realm of religion. There the products of the human brain appear as autonomous figures endowed with a life of their own, which enter into relations both with each other and the human race. So it is in the world of commodities with the products of men’s hands.

- Marx, 1867²⁶

²⁶ Quoted from the well-known passage in which Marx explains how the social relations that go into the production of commodities are obscured as they enter into relations of general exchange, and so the relations between people take on the appearance of relations between things (Marx 1976 [1867]: 165).

The influence of this teleological argument can be found in two strands of contemporary greened Marxism. In the “second contradiction” of capitalism, progress becomes the ultimate regress. If the first contradiction of capitalism is the bourgeoisie’s creation of a working class in-itself and, eventually, for-itself, then the second is basically the idea that the capitalist system is compelled to degrade the natural conditions on which it is ultimately dependent; and, therefore, capitalism sows the seeds of its own demise (e.g. O’Connor 1998). The other use of Marx’s teleological economism is more subtle. Generally, claims about the political economy of environmental change by Marxists are buffered against the “logic of capital.” As in the passage quoted from James McCarthy earlier, “The *imperatives* of capitalism necessitate ongoing attacks and outrages against sustainable, democratic, egalitarian relationships within human communities and in human uses of nature at all scales” (2002: 1298, emphasis added). There are manifold problems with this influential train of thought. The peculiar and rather uncomfortable use made of impending planetary ecological collapse, combined with the convenient ignorance of the ecological havoc wreaked in actually existing socialist countries, is immediately recognizable. I am prepared to admit that there is a grain of truth to the remarks made by Marx about the Orient, and the application of these arguments by contemporary Marxist scholars to the present-day failures of ‘progress’ is logical enough. Less recognizable is what course of action is suggested by the fatalism of the “second contradiction” and the “logic of capital.” Indeed, the disembodied exercise of power conceptualized in the socio-natural dialectic would appear to dictate that nothing can be done at all but hope that by chance socialism will emerge before the physical crisis of our world destroys the necessary material conditions.

The second argument Marx derives from the history – or the supposed absence of a history – of water government in the Orient builds from the economism of power explored above and takes the further step of fashioning power after a commodity, or more accurately a resource, in order to develop a theory of the Oriental State. Recalling the critique of Foucault, conceiving of power in these terms allows one to imagine that it can be acquired and accumulated by a single entity such as the state, the capitalist class, a despot or the people (Lemke 2002: 51). The problem with this conception of power is that an overly simplistic dichotomy is created between the victims of and the agents of domination, mandarins, capitalists, despots and the like. For Marx, history begins with pastoral nomads who foster communal ownership that settles into the bonds of feudalism which furnishes the appropriation of private property and, eventually, capitalist social relations (Peet 1985: 14). Private property is the precondition for class and class struggle. From Montesquieu, down through the classical political economy of Adam Smith, Richard Jones and James Mill, Marx absorbs the idea that the Ottoman State and, by extension, the Orient, had remained a “separate socio-economic entity” with its own particular history (or lack thereof) determined by the requirement of governing a vast empty terrain of arid plains (Peet 1985: 13). Because Marx does not find private property in the Orient but rather a spectacular array of public works, he hypothesizes a classless social composition under the control of a monolithic and abstract State that has captured the salient resource of power: water. This binary architecture of power creates an extreme version of the powerless/powerful dichotomy.

There have been in Asia, generally, from immemorial times, but three departments of government: that of Finance, or the plunder of the interior; that of War, or the plunder of the exterior; and finally, the department of Public Works. Climate and territorial conditions, especially the vast tracts of desert extending from the Sahara through Arabia, Persia, India and Tartary, to the most elevated Asiatic highlands, constituted artificial irrigation by canals and

waterworks the basis of Oriental agriculture. As in Egypt and India, inundations are used for fertilizing the soil in Mesopotamia, Persia, etc.; advantage is taken of a high level for feeding irrigative canals. This prime necessity of an economical and common use of water, which, in the Occident, drove private enterprise to voluntary association, as in Flanders and Italy, necessitated in the Orient, where civilization was too low and the territorial extent too vast to call into life voluntary association, the interference of the centralizing power of government. Hence an economical function devolved upon all Asiatic governments, the function of providing public works (Marx 1966a [1853]: 95, 96).

The Marxist position as outlined thus far is, certainly, at odds with the romantic notion that pre-modern civilizations sustained an idyllic and equitable relationship with their natural environs, as argued by Vandana Shiva (2002: 20): “Throughout history and across the world, water rights have been shaped both by the limits of ecosystems and by the needs of people,” with specific reference to India; or Escobar’s argument, made without reference to any empirical research in particular, that local (i.e. non-capitalist) communities are able to sustain an ‘organic’ relationship with nature, which is to say that nature and society are not separated in their thoughts and actions (1999: 5-10). Compare,

Now sickening as it must be to human feeling to witness those myriads of industrious patriarchal and inoffensive social organizations disorganized and dissolved into their units, thrown into a sea of woes, and their individual members losing at the same time their ancient form of civilization and their hereditary means of subsistence, we must not forget that these idyllic village communities, inoffensive though they may appear, had always been the solid foundation of Oriental despotism, that they restrained the human mind within the smallest possible compass, making it the unresisting tool of superstition, enslaving it beneath traditional rules, depriving it of all grandeur and historical energies. We must not forget the barbarian egotism which, concentrating on some miserable patch of land, had quietly witnessed the ruin of empires, the perpetration of unspeakable cruelties, the massacre of the population of large towns, with no other consideration bestowed upon them than on natural events, itself the helpless prey of any aggressor who denied to notice it at all. We must not forget that this undignified, stagnatory, and vegetative life, that this passive sort of existence evoked on the other part, in contradistinction, wild, aimless, unbounded forces of destruction, and rendered murder itself a rite in Hindustan (Marx 1966a [1853]: 99,100).

There is little romanticism lacing Marx’s remarks on the social life that preceded capitalism in the Orient. The immediate difficulty here is one of historical anachronism; that is, the power attributed to the despotic rulers of the Oriental state are exaggerated to modern proportions (Mann 1986: 97), and then superimposed upon its history in order to explain it. But since Marx has removed the Orient from history proper, the more serious

problem is the reduction of politics to a conspiracy which hinges explanations on deciphering the intentions of, apparently, vindictive despots. This particular dilemma is alive and well in the corporate thieves of Barlow and Clarke (2002), the ‘power elite’ that rules the American West encountered by Donald Worster (1985), the ‘Water Mandarins’ and ‘Water Lords’ of the work of Swyngedouw (2004: 116, 135); all analytical concepts Wittfogel (1957) would have been comfortable using in his chapters entitled: ‘A State Stronger than Society,’ ‘Despotic Power – Total and Not Benevolent,’ and ‘Total Terror’ (Mann 1986: 94). This picture is not entirely inaccurate, the exercise of power must have a material basis and some are more powerful than others, but it is certainly an inadequate framework within which to analyze the governance of nature in the modern epoch. As the analytics of government has done much to reveal, the forms of reasoning which inform the practices of government are often made rather plain and publicly available. The most pernicious and effective power is exercised not by some crazed despot but through the mundane practices that most people engage in everyday over, with and against each other and themselves. Though it was not these contemporary developments but rather the shifting geography of socialist revolutionary fervour that would bring about the final flowering of Marxist thought on Oriental Despotism.

IV. Water Science

Marx’ retrogressions in analyzing Asiatic society assume special significance. Obviously the concept of Oriental despotism contained elements that paralyzed his search for truth. As a member of a group that intended to establish a total and managerial and dictatorial state and was ready to use ‘despotic measures’ to achieve its socialist ends, Marx could scarcely help recognizing some disturbing similarities between Oriental despotism and the state of his program.

- Karl A. Wittfogel, 1957²⁷

²⁷ This passage is from the controversial final chapter of Wittfogel’s most important work, *Oriental Despotism* (1957: 387). It illustrates well the open hostility to Marxist politics that characterizes his later efforts, which is always couched in the argument that the Marxist concept of the Oriental state was overly abstract and insufficiently scientific (see, for example, Ulmen 1978: 501, 502).

The water and state of the Orient which emerges from the writings of Marx are unnecessarily abstract for Wittfogel, and the trajectory of his thought can be read as an extended effort to bring the nature of the Asiatic region into the fold of historical materialism. Marx traces the formation of the capitalist state to a class struggle organized around a mode of production, which is composed of the totality of the forces of labour, technology and organization and their dialectic with social relations in which the wealth is distributed according to the institutions of private property. In his 'history' of the Orient, however, Marx "is satisfied to mention a single person, the ruler, or an institutional abstraction, 'the state'" (Wittfogel 1957: 380). According to Wittfogel, the journalism of Marx suggests an alternative analysis, and one which is more consistent with the broader corpus of Marxist theory. The question need only be posed to the Orient as it was in the historical materialist examination of Europe; that is, who controls the salient means of production (i.e. labour, technical and organizational knowledge) and how are the relations organized in order to distribute the surplus which is produced? Wittfogel's detailed economic history of ancient China returns with the answer that China has been ruled by a class of bureaucrats. He goes on to argue that the Chinese ruling class "probably constituted the best educated bureaucrats in the whole pre-industrial world" (Wittfogel 1970: 7). Evidence of their prowess and rule can be found in the "rich literature and an institutional history that in documentation and detail remains unmatched to this day" and, in material terms, in their great buildings and, in particular, the "government managed works of irrigation and flood control" (Wittfogel 1957: 3). For all the sophistication apparently added, the rule of a 'despot' turns out to not be considerably different from the power exercised by the 'despotic' ruling class of bureaucrats. The

reason the ‘Oriental despotism’ so closely resembles the abstract monolithic of Marx can arguably be traced to Wittfogel’s other, more implicit, theoretical manoeuvre.

In a sense, Wittfogel can be considered the first Marxist theorist of water because of the nuance he adds to the materialist concept of nature. He is determined to theorize not merely nature in general but the essential qualities of particular natural circumstance and the influence these environmental factors exercise upon the mode of production in particular times and places. For Wittfogel,

history appears almost always in Marx — certainly European history does — as a struggle between one class of people and another, as a matter of labourers extracting a surplus from a passive physical world of ‘resources’ lying before them like an open mine, then watching that surplus get taken away from them by those who own the tools. Nature as a real, intrinsically significant, autonomous entity gets obliterated, by workers and owners alike, in Marx’s onward march of social progress (Worster 1985: 24).

Wittfogel strives to reverse this tendency and to stand the mode of production firmly upon the material circumstances which underwrite its existence. From Wittfogel’s reading of historical materialism the significance of natural factors increases as the forces of production are further developed. The dependence of the mode of production on nature is increasingly mediated by capital but the dependence nevertheless persists (Wittfogel 1985 [1929]: 47). In fact, he argues that “the greater or lesser abundance of the naturally-conditioned means of labour is more decisive in industrial development than the socially-developed means of labour” (33). So conceived, Wittfogel is able to shed Marxism of much of its unsystematic ambivalences toward the history and nature of Asia. There is “no contradiction” between the social and the natural: “Man is a part of nature; he belongs to it ‘with flesh and blood and brain.’ He is himself a power of nature, a living nature, albeit (and this is the first distinction) a living thing conscious of itself” (41). The result is a rather rigid dialectic between the state and its sources of hydraulic

power, uniting the two forms of economism subjected to critique by Foucault considered above. No matter how strenuously Wittfogel (e.g. 1970) strives to evoke a sense of contingency and the peculiarity of the Chinese result, in the last instance power can be traced to the economy and the decisive resource of power is natural (i.e. water). It is difficult, therefore, to imagine how things could ever have transpired otherwise.

There is little evidence to support what is perhaps the most well known criticism of Wittfogel's hypothesis: namely, that his hypothesis is the *result* of strident anti-Communism rather than theoretical and empirical analysis. While his later references to Marxism drift toward the polemical, Wittfogel's basic theoretical position pre-dates his critique of communism and changes little after his general research program of a political and economic history of the Orient from a Marxist perspective is framed in 1924 at the newly established Institute for Social Research in Frankfurt (Peet 1985: 3; Ulmen 1978: 64; Worster 1985: 25). Indeed, the reverse is more likely. It is his strict adherence to historical materialism as a science of society that leads him to be increasingly critical of the Soviet Union (Peet 1985; Ulmen 1978: 246; cf. Toynbee 1958). The positions taken by Arnold Toynbee and Gary L. Ulmen are representative of the two extremes of this debate over Wittfogel's work. Ulmen claims that "It is manifestly untrue, as some have charged, that Wittfogel adjusted his theories to fit an anti-Communist position" (1978: 246), while Toynbee argues that Wittfogel "gets at the Russian Communists by a roundabout attack on what he calls 'Oriental or Asiatic agromanageial despotism'" (1958: 196). In spectacular fashion, Toynbee goes on to claim that Alexander the Great, though instructed on the 'bad Asia' lie by Aristotle, recognized admirable qualities in the rulers of Western Asia and sought to institute a "partnership" in "World management"

between the Persians, Macedonians and Greeks. Unfortunately, Alexander died prematurely, taking his knowledge and policy innovations with him, “and the myth lived on, unscotched, till it was borrowed from the Greeks, in recent times, by the modern Western conquerors of the World” (Toynbee 1958: 196). Wittfogel, then, is accused of resuscitating the ‘bad Asia’ myth for the purposes of attacking the Soviet Union and the People’s Republic of China. The trouble with this line of reasoning is that Toynbee fails to make the crucial distinction between animosity-riven philosophy of ancient Greece and the nineteenth century disciplines engaged in an attempt to represent Asia with scientific accuracy for the purposes of colonialism (cf. Said 1978).

While it is patently obvious that Wittfogel was using his theory of ancient China to attack the political structure of modern communism (Mann 1986: 526), the argument he makes is clearly and consistently articulated from a position firmly located within a Marxist social science. More pertinent to this genealogy of the state-hydraulic hypothesis is an examination of the linkages forged between Wittfogel’s work and his intellectual milieu. His ideas are not without precedent. Inquiry into Marx’s comments on the Orient became pertinent as Marxist discourse and the prospects for socialist revolution spread eastward. The phrase “Asiatic restoration” was coined by Vladimir Lenin at the Stockholm Congress of 1906. Georgi Plekhanov had argued, then, against Lenin, that the geographical and environmental conditions of China, Egypt and Russia (i.e. dispersed and self-sufficient villages in a semi-arid climate which relied on the central government’s manipulation of several great rivers) had led to a distinctly Asiatic trajectory of socio-economic development (Plekhanov 1928: 50, 51). From this knowledge of the so-called Asiatic mode of production, he cautioned that Lenin’s plan to

nationalize agricultural and otherwise productive land in Russia would once “again bind peasants to the soil and bring about a ‘restoration’ of Russia’s ‘Asiatic’ heritage” (Ulmen 1978: 245). Lenin actually accepted the historical materialism behind the argument, but disputed the implied restrictions on future political action, and the idea had been abandoned by 1914, a time directly preceding the initiation of an ambitious program of restructuring Russia’s political economy (248).

The failure of the German uprising in October 1925 signalled the political stabilization of western capitalism, and Marxist scholars increasingly looked East, to the European colonies, and in particular China, for the source of the next socialist revolution (Ulmen 1978: 58). And once again the spectre of an Asiatic restoration loomed. From 1925 through 1926, Trotsky and Stalin rehearsed the earlier debate of Plekhanov and Lenin (247). This time, however, the stakes had increased considerably. At the Leningrad conference of 1931, the idea of an Asiatic Mode of Production was “denounced as a harmful perversion of Marxism” (Peet 1985: 3). As a consequence Wittfogel increased his academic and public criticism of the Soviet Union and Marxism, but it is only with the Soviet-Nazi pact of 1939 that formal ties were officially severed (3). The important point is that the Asiatic mode of production is not merely a ‘theory’ of the Orient but is also intricately tied to the struggle over how the political, intellectual, economic and geographic terrain of the East was to be constituted. In other words, the scientific stature of the social theory of water synthesized by Wittfogel was not corrupted by its political entanglements; it was from the beginning an attempt to put forward a science of politics; a science of politics capable of explaining the history of both the economy and nature and their interchange in the Orient, which was articulated in the language of the burgeoning

disciplines of the social sciences and humanities (e.g. anthropology, Oriental studies programs), in the universities of the West, where the influence of the state-hydraulic hypothesis would become most significant (Steward 1949, 1978). That the discourses of these disciplines are of paramount importance in structuring the hegemonic imagination of the boundary between the East and the West, the experience of each as well as the character of their relationship, is arguably the entire point of the *Orientalism* thesis of Edward W. Said (1978), explored in the first chapter of this thesis.

The fact that the representation of the Orient found in the state-hydraulic hypothesis owes more to a particular theoretical discourse and political strategy than the material and organic reality out there, in the Orient, is best illustrated by examining its considerable empirical inaccuracies. For Wittfogel (e.g. 1970), the key to the power of the bureaucratic ruling class was economic (i.e. agriculture). There is little evidence of the link theorized by Wittfogel between the bureaucratic class of the state and the hydraulic enterprises of the Chinese economy. Ancient irrigation schemes were small, in China and every other pre-modern civilization that has been subjected to systematic archaeological analysis. Early Neolithic societies were tiny. “In Mesopotamia it is especially striking that of the most important cities, Eridu and Ur, and Uruk and Larsa, were within sight of one another!” (Mann 1986: 98). Large-scale irrigation is a twentieth century phenomenon, dependent on pipes that can withstand high pressures, centrifugal pumps driven by refined hydrocarbons, and expansive domestic and foreign markets that can be reached in a timely fashion, that also depends on refined hydrocarbons (see, for example, Glennon 2002). Irrigation in China was effectively handled at the level of the village, or a “group of villages. They were usually organized by locals, sometimes

villagers and more often local lords. This variation was not technologically or ecologically determined” (Mann 1986: 94).

On the other hand, a plausible link between the bureaucracy and the peasantry might be found not within economic practices, strictly speaking, but within the extensive system of canals which were used for the transportation of the military, communication and flood defences. Though commodities also travelled on this network, the state was concerned with taxes and tolls not with determining their flow. Nor would the military reach extended by this infrastructure have engendered the centralized control envisaged by Wittfogel’s notion of a despotic ruling class of bureaucrats. Early states simply did not have the logistical, technological or organizational capacities needed to govern large expanses of territory without securing the good will of the local oligarchy; Wittfogel’s “model of all ancient states is quite fanciful in the real infrastructural power it attributes to them” (Mann 1986: 97). In sum, the state-hydraulic hypothesis radically flattens the material history of the Orient and is, therefore, unable to explain it. Modern powers of government are attributed to an ancient bureaucracy, which is then used to explain the evolution of the same ruling class that exercised total control. No society has ever been as unitary as Wittfogel imagines. Historically, water governance was both a centralizing and decentralizing force. It extended the knowledge and technology at the disposal of central authorities through canals and dams and calendars and literacy. And it simultaneously destabilized and fragmented the state by multiplying the vehicles of local power: just as the monarchy was accompanied by an aristocracy, early state formation was accompanied by the rise of leading families and of large private landholdings (Mann 1986: 98).

Although the genealogy of the state-hydraulic hypothesis can clearly be traced to the politico-theoretical strategies of early twentieth century Marxists, the problems faced by its ethos of analysis have little to do with a superimposed ‘political bias.’ This criticism is arguably rooted in a rather naïve notion of the supposed neutrality and objectivity of the social sciences and humanities. It is also, no doubt, connected to the “debilitating” fashion in which Marxism has come to be understood “as irredeemably totalizing and rigid in its theoretical architecture” (Castree 2002: 114). The social philosophical heritage bestowed by Marx, and his collaborator Engels, is rife with fruitful ambiguities and ambivalences which have served to facilitate virulent but ultimately constructive debates between Marxist scholars. Wittfogel’s contribution is best understood in this tradition, spurred not by the search for a true Marx but by the desire to make a constructive and critical contribution to a science of society inspired by Marxist theory. At the same time, the dilemmas encountered by the state-hydraulic hypothesis reach further than is often suspected. Conceptualizing power as an economic resource creates a rigid dialectical structure which provides neither convincing descriptions of water governance nor suitable explanations of environmental change. And these inadequacies, left unaddressed, are accentuated when the state-hydraulic hypothesis is thrust upon the modern stage by contemporary environmental historians.

V. Historical Revisionism

Karl Wittfogel deserves to be remembered today, not for his Cold War dogmatism or the ultimate stagnation of his ideas, but for those bright, creative years when he raised a profound question: How in the remaking of nature we remake ourselves?

- Donald Worster, 1985²⁸

²⁸ This passage is quoted from Donald Worster’s critical discussion of the theoretical legacy of Wittfogel (Worster 1985: 30). In the main, Worster falls into the trap of supposing that the basic problem with

I have thus far discussed Worster at some length without contextualizing his scholarly project, and as the criticism made of his analysis can largely be anticipated from the discussion of Wittfogel above, the appropriate place to begin is not with how Worster analyzes the environmental history of the American West but *why* he proposes to study it. The history of the American West as a distinct environmental entity has been written in accordance with two grand narratives (Worster 1991). The first is the ‘frontier thesis,’ or ‘Turner thesis,’ of Frederick Jackson Turner. In 1893, “the young University of Wisconsin historian captivated the discipline of American history for four decades [with the theory] that the United States was no cultural appendage of Europe but rather a new and superior civilization” (Malone 1991: 140). The central thrust of his argument was that the relentless expansion of the United States against a frontier of virgin wilderness, from the seventeenth century through into the late nineteenth century, had decimated the hold of the mores brought over from war-ravaged and hierarchical societies of Europe. This sequential frontier expansion had forged an American society which embodied the principles of “democracy, individualism, pragmatism, and a healthy nationalism” (140). The salient counter narrative emerged in 1931 in the form of the ‘plundered province thesis,’ articulated in the work of the Texas historian Walter Prescott Webb (Malone 1991: 142-146). During the grip of the dust bowl, Webb hypothesized that the environment of the drastically different semi-arid natural environment of the American West had indeed necessitated new practices and technologies, such as barbed wire and winds mills capable of penetrating deep into the earth’s surface (142). From similar premises, however, Webb draws conclusions which are exactly the opposite of those

Wittfogel’s theory is its anti-communist orientation and, therefore, he rehearses many of the same analytical errors.

drawn by Turner. The environment of the American West made the region utterly dependent on the federal government for capital and the coordination of public works projects. This dependency facilitated a form of colonization through which the industrial core of American capitalism in the Northeast was able to exploit the people and natural resources of the South and the West (148). In this account, the West is less the beacon of individualism and democracy than a poor colony, with an economy based on resource extraction, administered by a distant federal government.

While ostensibly moving toward disparate objectives, as the professional study of American history expanded after the Second World War, these theoretical discourses drew from a similar language to construct a familiar narrative. A heavily footnoted history emerges which is organized around a similar story and arsenal of clichés: development, expansion, and, above all, ‘growth’ and the virtue and necessity of relentless economic growth (Worster 1991: 11). “Through the 1950s and 1960s not a few western historians acted as though they were chartered members of the Chamber [of Commerce], and their books and articles could almost have been introductions to company reports or state tourist brochures trumpeting the arrival of a ‘New West’” (13). There are three important stories missing from this history, according to Worster: first, an account of the violent, androcentric, and imperialistic processes which wrested the frontier from its indigenous peoples; second, the wonton depletion and degradation of the material and organic environment which accompanied the settlement of the American West by white Europeans; and, third, the concentration of power in the hands of a small elite based, not in the East, but rather founded upon a capitalist-bureaucratic complex of military spending and, more importantly, the large-scale manipulation of the waterscape

for the purposes of irrigation (15-21). As mentioned previously, I sympathise with the broad outlines of Worster's call to revise what has counted as the history of the American West. What I take issue with here is his source of theoretical inspiration, which leads to a peculiar historical myopia of a different order.

In short, Worster (1985) contends that, in the American West of the late nineteenth century, the requisite knowledge and technology, economic and ecological conditions collide to forge an actually-existing hydraulic society as envisioned by Wittfogel. The key insight Worster takes from Wittfogel is that environmental conditions do not *determine* the formation of social relations, as previously argued by Turner and Webb, but rather the semi-arid ecology co-mingles with the particular stage of political and economic development to create a social structure particular to a specific time and place. Misguided by his anti-communist and, by extension, pro-capitalist political bias, Wittfogel merely lacked the intellectual courage to draw the right conclusions about the modern society of the American West from his state-hydraulic hypothesis. Worster uses Wittfogel's hypothesis to create a set of ideal types of water control. The most elaborate and relevant of which is the third and final ideal type created by the modern capitalist state (Worster 1985: 51-57). This mode of water control is characterized by large-scale capital and water intensive agricultural holdings which forge a mutually constitutive relationship with a powerful bureaucracy of planners and elected politicians. "Neither group is autonomous. Both need each other, reinforce each other's values, compete for the upper hand without lasting success, and finally agree to work together to achieve a control over nature that is unprecedentedly thorough" (51). The agricultural plantations eventually become well-organized and rich, and, rather than submitting to a bureaucratic

ruling class, they are able to coerce tax breaks from the state along with extravagant waterworks projects for their own benefit. They also “hire an anonymous human army, which they use to turn the arid spaces into green fields...With these wage employees, the modern domination of water becomes most vividly and unmistakably translated into hierarchy...rivers, in turn, become means of control over workers” (51). Science and technology are provided with pride of place, and the “awe-inspiring” mystery, “intrinsic value” and “integrity” of the nature of water is hollowed out and turned into “so many ‘acre-feet’ banked in an account, so many ‘kilowatt-hours’ of generating capacity to be spent, so many bales of cotton or carloads of oranges to be traded around the globe” (52). If this argument appears to rely upon the domination of nature made possible by a romantic retreat from its true essence, Worster confirms such suspicions by evoking Horkheimer’s critique of instrumental reason. The overthrow of the capitalist mode of water control and true democracy can only be realized, when ‘reason’ is permitted to answer those ultimate questions about how we want to live, and the hegemony of the instrumental reason of science and technology which serves only the insatiable ends of capital accumulation is dispensed with (Worster 1985: 54-57).

There is obviously a measure of veracity in the empirical claims of Worster, but the modern history he presents is just as certainly an incomplete one. It is a well known that in America,

Today, as a result of the dam building era, we move huge quantities of water out of watersheds, often to cities hundreds of miles away. To accomplish this feat, we have engineered pumping stations with pipes that go over mountains, drilled tunnels that go through mountains, used unlined canals through sand dunes of the Imperial Irrigation District in southern California, and built a concrete –lined canal called the Central Arizona Project that moves water from Colorado River east to Phoenix and eventually south to Tuscan, a distance of over 330 miles and almost 3,000 feet up in elevation. From the Colorado River basin alone, we supply water to areas outside the basin that include Denver, Albuquerque, Salt Lake City, San Diego, and Los Angeles. We literally move water uphill to wealth and power (Glennon 2002: 21).

Such observations, however, reveal little about the forces that move water, how power is exercised, and by whom. I want to set aside, for now, the chimera of an original West constituted by a reverence for Nature's intrinsic value and worth. It is largely left undeveloped in Worster's work on the state-hydraulic hypothesis and the problems with this argument have already been discussed with regard to the work of Vandana Shiva (2002, 2002a). Instead, the first criticism I will make of Worster's argument concerns its oversimplification of the history of the government of water. In California, for example, from at least 1850 onwards, water government is the object of protracted struggle, competing moral claims, legal definitions, and economic practices (Pisani 1996). The *unitary* capitalist class, envisioned by Worster, with its power located in irrigation and capital intensive agriculture, is in fact a highly fractured terrain. Water rights in the American West have been shaped by miners and their economic practices, which generally worked within the discourse of 'prior appropriation,' based on the *first in time first in right* principle. Prior appropriation morphed into *unlimited* 'private' rights for water companies that supplied the miners, then manufactures, irrigators large and small, and, finally, the growing demand of urban consumers. The diversification of the practices intersecting with water governance then led to other discursive struggles, for instance, over 'riparian' rights (i.e. *equal* access to all those adjacent to a particular water source) between communities as well as agricultural enterprises. All of which was complicated by legislative battles over whether the "law should work to provide the greatest opportunity for the largest number of individual economic actors" or serve to "encourage the most rapid development of natural resources" (Pisani 1996: 35). Nor is there much evidence of the monolithic bureaucracy against which Worster buffers his

capitalists. Nineteenth century political discourse in the United States was defined by a series of paradoxical, if not openly contradictory, desires for economic growth, liberalism, as well as “a healthy fear of both private and public power” (197). The result was a mode of government characterized by a complete absence of any desire or ability to plan, which effectively handed water governance over to an array of competing concerns based in agriculture, resource extraction, budding industrial and urban practices, of both private and public spheres, with competing definitions of the law, the ends sought after, as well as the nature of water and rights to it (198).

To be fair, the capitalist-bureaucratic ideal type appears to be designed to capture twentieth century, and specifically post-war water governance, as it relies metaphorically and analytically on Promethean dams, reservoirs, canals and the “intensive, large-scale manipulation of water” (Worster 1985: 7). But even if a regime resembling the capitalist-bureaucratic elite gradually emerges in this period, and what this historical ‘stage’ includes and excludes is less than clear²⁹, his hypothesis surely still exaggerates the power it wields over the government of water. As the first chapter of this thesis made plain, the government of water becomes increasingly complicated, fractured, and contested as the second half and then the close of the twentieth century approaches. Worster’s rather simplistic dichotomy between an all powerful nexus of the state and hydraulic enterprise and an “anonymous human army” turns out to be an even worse

²⁹ By the mid-60s, much of the convenient and high-yielding waterways of North America had been tapped, and capital began flowing into the construction of mega-water projects and dams in the so-called developing world under the pretext of the Green Revolution (Bryant and Bailey 1997: 95-96). Up to the and including the 1940s, 4,270 large dams, that is, over 15 metres high, were commissioned worldwide. Whereas between 1950 and 1990, more than four-times that number of dams were commissioned, or 17,372 in total, and this number rises considerably if the less reliable data on China is included (World Commission on Dams 2000: 396). After 1990 figures begin to decline sharply, and the decommissioning of dams becomes a significant item on public agendas in the ‘developed’ world (McCully 2001: 125-7).

caricature of modern and late-modern water governance. “A better metaphor” for the American West, as Thomas E. Sheridan has argued,

is that of a feudal society of competing warlords – copper companies, railroads, ranchers, farmers, utility companies, real estate developers, municipal governments – held together by a weak state. In Arizona, business, big or otherwise, is not a monolithic force, and neither is the federal government. Different federal agencies sue and compete for jurisdiction and appropriations and even sue one another over Indian water rights (1998: 166).

Sheridan’s (1998) case study of the Central Arizona Project (CAP) illustrates well the problem with Worster’s conception of the government of water as an act which is imposed from above. Under the administration of Jimmy Carter, in 1977, the federal government attempted to quash the Central Arizona Project, a 335-mile long canal destined to quench the growing thirst of Tucson, the state’s second largest metropolitan centre. The estimated price tag of the project had reached \$1.5 billion (USD) by 1968 and, while it may have also been designed to increase the state’s irrigation-based agricultural output, the cost of the water to the individual farmer was anticipated to reach \$130 per acre-foot, or approximately \$91 more than the cost of water that could be pumped out of the ground at that time. As Marc Reisner has remarked, “In 1980 about the only crop you could raise with water that cost \$130 per acre-foot was marijuana” (quoted in Sheridan 1998: 182). And, indeed, the “desire for control of the Colorado River has run like a drug through the veins Arizonans throughout the twentieth century” (163). The CAP cannot be explained through the intentions of Worster’s dual-headed elite nor the purposes it served for the capitalist economy. Multiple and overlapping discourses – from jingoistic anti-Mexican and anti-immigration politics, to Judeo-Christian mores, the technocratic “gospel of efficiency,” and a vague understanding that the western rivers must be tamed in order to reclaim the great American desert “from wilderness and waste” – formed the geographical imagination which continually

resuscitated the CAP whenever it looked like it might be abandoned by the central government (184). Such events require an ascending analysis of power dispersed into an impressive array of political and moral discourses, cultural and economic practices, and the genealogical tracing of manifold lines of thought and practice through scratched and muddy documents and “local memories” (Foucault 1994b: 369). Strict lines of causation, ideal types, and hypo-deductive reasoning fails to capture the tenuousness and contingency of the history of present water governance. When the water of the CAP finally did reach Tuscan, in 1993, people refused to drink it. It tasted and smelled ‘bad’ (Sheridan 1998: 184).

VI. Writing the conclusion of the state-hydraulic regime: political ecology

An ambitious and global research project launched by scholars – including Karen Bakker, Estaban Castro, David Harvey, Maria Kaika, Ben Page and Erik Swyngedouw – previously or presently affiliated with the school of geography and the environment at St. Peter’s College, Oxford (i.e. the Oxford School) has begun the work of writing the story of the end of the state-hydraulic hypothesis. In the main, these scholars subscribe to a variant of political ecology which can be defined concisely as a Marxist critique of the political economy of social and environmental change (Bakker 2003a). Not surprisingly, the most important water theorists from this perspective are Wittfogel and Worster (O’Connor 1998: 117, see also Swyngedouw 2004: 35). Many of my criticisms of this research program can thus be anticipated from the preceding discussion. Again the key contribution of this work is the insight provided into the intersections of social power and the contouring of the material and organic environment and, specifically, the waterscape (e.g. Swyngedouw 1999). Its reliance on shifts in the economic practices is insufficient

and unnecessarily restrictive; and, for the most part, the reader is told what they already know in the Marxist terminology of processes like ‘commodification’ and/or ‘privatization’: the investment of capital from private enterprises and large corporations in the government of water has increased in the period following 1970 (e.g. Bakker 2003a). The demise of the state-hydraulic alliance is then traced from locales as diverse as England and Wales (Bakker 2003), Spain and Ecuador (Swyngedouw 1999, 2004), Greece (Kaika 2003), Argentina (Loftus and McDonald 2001), and Cameroon (Page 2002). The first problem, of course, is that the state-hydraulic regime never existed in the *sui generis* way which is taken as the point of departure. It was the invention of the politico-theoretical discourses in which it was construed as an appropriate plan of socio-economic transformation as much as it ever faithfully represented a reality out-there in the world. The second, and related problem, is that many of the essential features of the state-hydraulic hypothesis are still operating in a complex and contested fashion, overlapping with other geographical imaginations in specific locales, such as Canada, where the governance of water remains overwhelmingly in the public domain (Clarke 2005).

The third, and arguably the most salient, difficulty with the political ecology discourse of the Oxford School is that it is politically debilitating. I recall a conversation that I had with Tony Clarke of the Polaris Institute after a conference presentation in 2004 in which I had reviewed the implications of David Harvey’s ‘regulation school’ political economy for the study of water government. Harvey is the senior theoretician at the Oxford School, and is cited frequently in the publications of its younger scholars. The work of the Marxist geographer David Harvey (e.g. 1990; 1996; 2003) has added considerable

nuance to the theory of capital as a dynamic process. He begins by re-visiting the classic formulations of Marx. The elements Marx encounters in his analysis are not terribly novel. Workers, commodities, money, and so on, are far from peculiar. Drastically different, however, are the processes within which these elements have come to be assembled and the ends to which they are now directed. He provides us with a standard circuit of simple commodity production: commodity – money – commodity, (C – M – C). People sell in order to buy. That is, commodities are produced and exchanged so that more commodities may be purchased. At the end of this simple commodity circuit (– C), the producer has the desired commodity and the decision is left to her whether or not to enter into the process once more (Marx 1976: 248). On the other hand, under the capitalist mode of production the circuit is assembled differently. Money is used to produce a commodity and then that commodity is used to buy (more) money (M – C – M'). Provocatively, he calls the incremental increase over the original 'surplus-value.' (251). At the conclusion of the circuit the producer is left with an abstraction, which represents more money (M') but its value rests upon its potential to be 'exchanged' once more through another circuit. In this way, the process is self-valorizing, adding value to itself and all capital is thrown right back into the process, by definition (256). The main point to be gleaned from Harvey's interpretation of Marx, I would argue, is that capital is an assemblage, which is directed in certain ways toward intangible and abstractly defined ends.

In other words, capital "is a process not a thing" (Harvey 1990: 343). Capital has a relentless metamorphosis within this process; it takes on distinct forms; capital is money; capital is commodities; capital is living and breathing labour; and, by extension, capital is

water. Capital must continue to move or the value assigned to it is threatened. Harvey thus comes to a theory of capital which is in a perpetual state of motion. If capital ceases to move in a profitable motion, it becomes threatened with devaluation, acquisition and, in a sense, destruction. Working from a not dissimilar formulation, Marxist scholars have deduced a series of inherent contradictions, which all lead, basically, to over-accumulation. Over-accumulation can be thought of here as just the absence of a circuit within which capital can attain value, which then threatens the process of capital with devaluation in its territory or space of origin (Jessop 2004: 5). What Harvey has added is a theory about how the movement of capital intersects with the dimensions of time and space. In short, Harvey argues that the process of capital is absorbed, and thus over-accumulation averted, through forms of temporal and spatial displacement, which create new circuits that allow capital to continuously move and increase its value. Temporal displacement might involve embedding capital in the land, such as with infrastructure or the built environment of production and consumption, which can be financed long into the future through the mechanism of the public debt. Spatial displacement, on the other hand, is facilitated by the opening up new resources that can be assembled inside circuits of capital, as well as new markets, or even the acceleration of the circuits of capital through innovations in the spheres of production and consumption (Harvey 2003: 109). Harvey builds his theoretical model by arguing that sometimes temporal and spatial displacement are distinct, while at other moments they converge. Bob Jessop (2004a: 490) has revised this notion, arguing that displacement always exhibits spatial and temporal aspects. This is clearly apparent in the case of water, which simultaneously expands the resources to be aligned with capital and also provides avenues for

assembling circuits of long-term infrastructure development. From this, it could be deduced that capitalism expands dynamically, simultaneously expanding and compressing capital circuits the world over, as with each circuit more money is used to produce more commodities which are in turn exchanged for ever more money. This premise is used to formulate hypotheses of inherent contradictions and cyclical crises of over-accumulation.

It is this last manoeuvre to reveal intrinsic contradictions which provides Harvey's work with its critical power. Neo-liberal water government is foremost construed as a response to

mounting economic problems – in the context of high social and investment spending – [which] resulted in growing budgetary difficulties for the national (and often local) state. This necessitated a reconsideration of the direction of state spending and resulted in reduced expenditures for the welfare sector, as well as supporting debt-ridden industrial sectors and infrastructural programs. The low prices, the subsidized water investments, and even the aging water infrastructure, combined with a still growing demand, put even greater pressure on state budgets – pressure that ran counter to the above processes (Swyngedouw 2005: 85).

At first glance this all seems quite reasonable, troubling, to be sure, but basically accurate. My conversation with Mr. Clarke, however, revealed the irony behind the apparent veracity of the argument. First, this is exactly the same definition of the problem used by neo-liberal economists (World Bank 1992, 2000). Given the economism of the analysis, water appears to already be a commodity, priced, as it were, but not sensibly enough to avoid the contradiction of over-accumulation, and it is unclear, then, why or how its 'commodification' is to be resisted. Moreover, the teleological economism in which changes in water government are explained by inevitable crises of the global political economic system leads to a kind of resigned fatalism. Not only have people not made their material and organic *fortunes*, forces beyond their control continue to shape their future circumstances, so just sit back and wait for the environmental

apocalypse. An exaggeration, perhaps, but how things could ever have been otherwise is far from clear. Worst of all, the political action inspired by the Oxford School rallies to the defence of the state-hydraulic apparatus, mourns its demise, and becomes the theoretical inspiration behind the managerial and nationalistic spirit of the Canoeist geographical imagination. In conclusion, I want to argue that there is an urgent need for a more nuanced account of the so-called state-hydraulic mode of governance, an open-ended analytical history which can provide a space for people to imagine how they might invent a manner of governing themselves, each other and the nature of water differently.

Chapter four: toward a genealogy of the governance of water in the Canadian West

Government is the right disposition of things...I do not think this is a matter of opposing things to men, but rather showing that what government has to do with is not territory but rather a sort of complex composed of men and things. The things with which government is concerned are in fact men, but men in their relations, their links, their imbrication with those other things which are wealth, resources, means of subsistence, the territory with its specific qualities, climate, irrigation, fertility, etc.; men in relation to that other kind of things, customs, habits, was of acting and thinking, etc.; lastly, men in their relation to...accidents and misfortunes such as famine, epidemics, death, etc.

- Michel Foucault, 1978³⁰

I. A critical introduction to an analytic of the government of water

This chapter returns to the analytic of governmentality, inspired by the provocative definition of government found in the work of Foucault (1991a), in order to develop a case study of the governance of people and water on the Qu'Appelle River system. It is also a return to the struggle over water government that originally inspired this investigation into the theory and philosophy of the history of people and water available in the social sciences and humanities. While clearly provoked by Foucault's insights into the quintessential features of modern government, it has become clear that a trenchant application of the analytics of governmentality is not without certain weaknesses.

Foucault's concept of government allows us to experience the government of water as a historically and contextually specific way of framing the thought and action taken upon a particular territory in order to cultivate particular qualities. From this perspective, government is not merely a response or adaptation to the underlying and 'natural' circumstances of a given material and organic environment. Geography can exist only to

³⁰ This definition of government is taken from Foucault's seminal essay entitled 'Governmentality,' which is based on a series of public lectures delivered at the Collège de France in the 1978 (1991a: 93). This particular quotation, with its emphasis on the way modern government seeks to cultivate links between a particular population and its territory first appeared in a piece by Bruce Braun (2000: 8).

the extent that it is made thinkable and practicable in frameworks of government. These geographical imaginations constitute ways of reasoning – lenses through which a territory's qualities can be interpreted and future territorial configurations can be imagined – that make up the grid of understanding by which complex ensembles of techniques can engage in the direction of present action.

As Mitchell Dean (1999) has explored, Foucault points to an epistemological break in how the art of government is understood and known. While science of politics articulated by Machiavelli was concerned with strengthening the fragile hold of the Prince upon his principality, modern government is concerned more with the optimal disposition of the territory, its people, as well as its material and organic elements. In time, the power of the sovereign has come to be re-written as sets of legal tactics, disciplinary power re-directed as a means by which bodies are trained to realize their capacities, and the formation of a sovereign-disciplinary-governmental triangle has spawned the full panoply of apparatuses through which territorial compositions and the living and breathing people are recast as a population of resources to be cultivated (Dean 1999: 20). This shift in the art of government also calls for a distinct analytical approach. Consistent with the ethos of analysis employed within the literature of governmentality, this study will concentrate on the spaces and subjects which have been constituted discursively and practically in order to be governed and how, the modes of calculation and knowledge, the experts and apparatuses which have arranged them, their techniques and strategies, the goals that have been sought as well as the methods of reflecting upon and evaluating this process (Dean 1999: 20-39). It should also be stressed that the analytics of governmentality take as their object a rather decentred and embodied form of

power which resides at the nexus of the multiplicity of ways of thinking about and acting upon oneself and others (Foucault 1994a: 225). And thus, at the behest of Foucault (1991a: 95), governing will be envisaged broadly as the full panoply of tactics and devices used by and through people toward the optimal disposition of people and things. The object of analysis will not be merely what water is or is not in reality, but rather how water is constituted through the manifold rationales and the technologies deployed in order to shape the contours of the material and organic environment, as well as to shape the conduct of governing, and to govern the shape of conduct.

This case study of the Qu'Appelle river system begins with the imposition of an imperialist geographical imagination, which attains a certain hegemony or dominance. As Bruce Braun (2000) has noted, few scholars have explored the implications of Foucault's work on government for the history of the constitution of territorial qualities, things and natures. The following analysis will aim to make a modest contribution toward rectifying this absence. However, in isolation the ethos of analysis deployed in the governmentality literature would fail to capture the complexity of the competing discourses and practices, their struggles with one another, and the tenuousness and fractured character of the dominance of others and nature when it is, in fact, imposed (Hunt 1999a; O'Malley and Weir et al. 1997). Beyond the officials of government, scientific experts, and isolated individuals, there are social movements and collective acts of resistance which have been of fundamental importance in shaping the government of water along the Qu'Appelle River. In order to add further nuance to this case study, then, Gramsci's concepts of hegemony and resistance are first elaborated upon briefly. After exploring the early modern history of imperialism, this study moves to examine the shifts

initiated by the consolidation of a governmental regime intent on 'developing' the region in a manner consistent with a capitalist geographical imagination.

II. Antonio Gramsci, hegemony and resistance

As much as any other scholar aligned with the Marxist tradition, Gramsci eschewed the narrow economism that was to grip the development of historical materialism in academe. His work speaks from the perspective of a committed politician and communist practitioner, who also witnessed the dramatic changes that would give birth to the widely dispersed and loosely coupled state apparatuses (Hoffman 1984: 13), which are so characteristic of Foucault's disciplinary power. Crucially, Gramsci rescues 'ideology' from both brainworkers and the sphere of production. For Marx,

The class which has the means of material production at its disposal, has control at the same time over the means of mental production, so that thereby, generally speaking, the ideas of those who lack the means of mental production are subject to it. The ruling ideas are nothing more than the ideal expression of the dominant material relationships.... grasped as ideas (Marx and Engels 1968: 61).

Foucault has certainly disrupted this tight relationship strewn between the mechanisms of mental production and those of material production. He has also, arguably, handed mental production over to sets of experts. There are, for instance, authorities that work to organize regulations which are designed to ensure that each departure from their established norms is disciplined according to the proper quantities and qualities of institutional surveillance, supervision and coercion (Foucault 1995: 299). This manoeuvre has led to the lament that Foucault has replaced Max Weber's 'iron cage' with a modern supermax prison. This totalization of expertise has been met with its share of polemics, for example: "Do we act politically, overthrow tyrannies, make revolutions, create constitutions to establish and protect human rights? Mere 'juridical regression' from the feudal ages, because constitutions and bills of rights are merely 'the forms that

[make] an essentially normalizing power acceptable” (Berman 1982: 34). Setting aside the dramatic tone of Berman’s response, he does point to an interesting conundrum encountered by a trenchantly Foucaultian piece. History is not without irony. It is thus up to Gramsci, whose most influential philosophical writings were penned while incarcerated, to take discourse out of the prison. He stresses that in modern societies, with the expansion of education (Gramsci 1971: 10), everyone is an intellectual but not everyone is a philosopher and thus ideology must work at the level of common-sense, or the philosophy of non-philosophers (419). Ideology is made a positive force similar to the consequences of the power/knowledge schematic, but it is also brought to the masses. Ideology, in Gramsci’s work, is analogous to the discourses of the linguistic turn; however, the potential for cleavages is introduced. It is, therefore, not a systematized high-philosophy (e.g. liberalism) but the discourses that make possible everyday life and practical action and so the totalization of expertise in Foucault’s account is here fractured.

Gramsci argued that domination in modern capitalist societies was largely achieved through *hegemony*, which he understood to be the steering and guiding of spontaneous consent granted by individuals through the voluntary actions of everyday life (Kilminster 1979: 134). Hegemony is the elevation of the ideological discourses of certain groups and classes over a universal plane (Hunt 1990: 320). Through the achievement of hegemony, at a particular time and place, specific classes or groups are able to coalesce and form a *historic bloc*. In this formulation hegemony is perpetually fraught, because, for instance, it is an assemblage of discourses that must facilitate the everyday life of many toward goals which favour but a few. And, in a sense, the resources of expertise are democratized to the extent that people are intellectualized. Only through an exchange

between the rulers and the ruled can a historic bloc sustained (Gramsci 1971: 418). Since there are, theoretically, as many ideological discourses as there are life circumstances, the potential for rival groups to begin formulating counter-hegemonic discourses with wider appeal is ever-present, and actually facilitated by the education which is paradoxically needed to sustain the hegemony of the historic bloc. In this way, Gramsci provides us with the tools needed to begin asking questions about the resistance that meets domination. Alan Hunt (1990) has further argued that there is no reason why our conceptualization of counter-hegemony cannot be extended to struggles for rights articulated in legal terms. Legal power is thus scooped from the guillotine hanging fatefully over the head of the King. It is critical to re-establish a back and forth between resistance and domination with regard to legal rights, which have loomed so large in struggles generally (e.g. Igantieff 2000) and over water in particular (e.g. Barlow and Clarke 2002).

Yet, in the final analysis, perhaps, Gramsci's account is rather optimistic; it exhibits that revolutionary Marxist penchant for finding in capitalism the contradiction which is the seed of its own demise³¹. He also retains that awkward "chicken-and-egg" problem, in that he argues the capitalist classes are able to use their economic leverage to seize control over the state and penetrate the apparatuses of civil society, while maintaining, contrary to Lenin, that the state and the economy do not have to be first re-captured (Waters 2000: 183). Of course, this dilemma is not unlike the one encountered by the state-hydraulic hypothesis in the previous chapter. For Gramsci, however, such a

³¹ Gramsci (1971: 330) rests much hope on his conception of the *Modern Prince*, or the organic intellectual. Basically, this is an educated working class person who can take the ideological discourses of the working classes to a universal plane. This conceit is intimately related to Gramsci's own political project, but it takes nothing little away from resource his work provides.

criticism was held to be irrelevant because in the West the coercive and military power of the state had become impenetrable. Counter-hegemonic struggles, fought through the apparatuses of civil society, over everyday consent, were the only resort. He called this struggle over hegemony a 'war of position' because it could be sustained one victory at a time, in contrast to the 'war of movement' executed by the Bolshevik seizure of state power. To Gramsci's credit, some have suggested that the struggle waged by the Zapatista's in Chiapas, Mexico, is reminiscent of the 'war of position' strategy. Noting the Mexican government's relative proficiency at war and the Mexican people's aversion to violence, the Zapatista movement has consciously decided to expend much of their resources upon engaging with the civil society at home and abroad through the national media and, in particular, the Internet (Bruhn 1999: 29). But such empirical questions aside, I think it is reasonable to contend that Gramsci provides us with some useful analytical tools. His work is a resource from which we can draw in order to ask questions that Foucault was not interested in or just did not pose in any systematic way. It may help to finish with a metaphor. Whilst Foucault illuminates for us the complexity, fragility and open-ended construction of the infrastructure of power, Gramsci points us to the primary contractors, the main thoroughfares and, of critical importance, the upcoming off-ramps and exits.

III. A genealogy of the government of people and water on the Qu'Appelle River

Sitting up to my eyebrows in the grass of what was once Hamona's barnyard, I looked out across the Qu'Appelle bottomlands and felt something of Paynter's optimism. I saw for that moment how such landscape gives rise to optimism, big dreams. Throughout this great continent, places like the Qu'Appelle remind us why the Great North American conceit of man's perfectibility in the New World has outlasted five hundred years of failure, why it continues to serve our sustaining myth.

We still believe we can do something new here. And that belief pushes small improvements in from the margins of our social contract. Small experiments, utter failures, five-year attempts at utopia quietly germinate in the thin topsoil of

our time upon this difficult land and then emerge as minor triumphs – co-operatives, agrarian reform a politics of social justice, medicare.

- Trevor Herriot, 2000³²

This case study will trace the genealogy of the discourses that were to frame the governance of water in the Canadian West and their intersection upon a portion of the Qu'Appelle River, during the early colonial period. In 1869, for £300,000 and one-twentieth of all the land suitable for agriculture, the executive of the Canadian government purchased the property rights to "Rupert's Land" from the Hudson's Bay Corporation. Three provincial governance jurisdictions would eventually emerge; first, however, the Prairie "region would go through a period of colonization and 'tutelage' until the land might be 'settled' like that of the East" (Findley and Sprague 2000: 213). The dominant discourse engaged in the constitution of this settlement might aptly be described as *imperial hegemony*, brought to Canada as it was through the immigration of several British architects of the Great Reform Bill of 1832. As mentioned in the first chapter, it has often been remarked that these reforms officially signalled the fall of mercantilism in Britain and served as the blueprints for the transfer of power from aristocracy to a bourgeoisie with its power hedged in industrial enterprise (203). The authors of this transition would inscribe this mentality throughout the various branches and concerns of the government of Canada. The political technology enabled by Canada's *National Policy* during the subsequent decades was to act upon the Canadian West as a colonial possession, a producer of natural wealth, staples, forestry and mineral resources, as well as a market for the manufactured goods of the industrial core to be constituted in Central Canada (Conway 1994: 13). Generally, it has been observed that

³² This passage is taken from Trevor Herriot's masterful historiography of the Qu'Appelle Valley (Herriot 2000: 249).

imperial hegemony is achieved by mobilizing various groups behind patriotic, often jingoistic discourses, and grand 'nation' building schemes (Harvey 2003: 44). This strategy thus faced a constant tension between its desire to assimilate and subordinate the West. The technologies capable of executing this rationality were relatively limited at first. On the one hand, with capital raised on the London exchange, financed through the mechanism of a burgeoning public debt, a railway network was strewn across the region, which subsidized the movement of resources eastward and the travel of manufactured commodities westward. On the other hand, the surveying instruments ensured for the constitution of large homesteads in stark isolation from one another across the landscape. An unstable historic bloc was thus formed between the colonial administrators and the settling population, to the general exclusion of the 100,000 or so Indigenous peoples who also called the Prairie portion of the Canadian West home. The discursive practices deployed in the representation of the region's Indigenous population would prove to be similarly fraught, though there is considerable evidence of the deployment of ingenious strategies in the hope of overcoming these tensions and limitations.

On September 15, 1874, the government of Canada and the Assinibione, Cree and Saulteaux Indigenous peoples completed a series of drawn out negotiations and signed the fourth of the numbered treaties (Government of Canada 2004). Over the course of the next decade, the Indigenous peoples would come to inhabit a series of six reservations³³, which straddle the Qu'Appelle River as it meanders lazily through the Qu'Appelle Valley and opens up into the 'chain lakes.' For the Indigenous peoples, oral histories suggest that the treaty was envisaged as a compromise between military allies, which would

³³ See Chapter one, page 10, for a more detailed description of the Qu'Appelle River's location. These First Nations' reservations are currently known as the Cowessess, Muscowpetung, Ochapowace, Pasqua, Piapot and Sakimay.

ensure certain rights, symbolize peaceful intentions and serve as a basis for future negotiations (Stonechild and Peigan 1982). The Anglo-American discourse that constituted the Indigenous peoples, on the other hand, was a rather peculiar mentality. The 'Indian' was constructed as essentially and intrinsically different and largely inferior, which was coupled with a desire to assimilate their population into what was constructed as the highly moral culture of agriculture. But this self-satisfied desire to train the 'Indian' in the moral ways of sweat and toil was complicated by the compelling sense that the 'Indian' was probably incapable of acquiring such a disciplined disposition. The implicit tension written into this racial discourse has a lengthy genealogy, which is perhaps summed up best in this letter of personal correspondence from Thomas Jefferson, in 1807:

Our system is to live in perpetual peace with the Indians, to cultivate an affectionate attachment from them by everything just and liberal which we can do for them within the bounds of reason. When they withdraw themselves to the culture of a small piece of land, they will perceive how useless to them are extensive forests, and will be willing to pare them off...in exchange for necessities for their farms and families. To promote this...we shall push our trading houses, and be glad to see the good and influential individuals among them in debt, because we observe that when these debts go beyond what the individuals can pay, they will become willing to lop them off by a cession of lands (Berton 2001: 40).

In the Qu'Appelle region, similarly racialized discourses intersected with the imperial hegemonic strategy giving rise to an impressive array of disciplinary techniques. The problematization of the morality of the 'Indian' was comprehensive and political technologies were directed toward a project of complete assimilation of the Indigenous people. Said Duncan Scott, the Deputy Superintendent General of Indian Affairs, in 1920,

I want to get rid of the Indian problem. I do not think it as a matter a fact that this country ought to continuously protect a class of people who are unable to stand alone. Our object is to continue until there is not a single Indian in Canada that has not been absorbed into the body politic and there is no Indian question, and no Indian department (Carter 1990: 252).

The Indigenous people were thus subjected to the full panoply of political technologies: the so-called 'austerity' programme which involved the manipulation of food rations during years of poor harvests, of which there were many; the surveillance technology known as the 'pass system' which monitored and restricted movement between reservations; the peasant farm programme which sought to instill primitive farming techniques from which the 'Indian' would become moral and presumably ready for more advanced ploughs; the policy of subdividing reservations from collective into single family holdings; the notorious residential school system, as well as the more the general harassment perpetuated by the Northwest Mounted Police (Carter 1990). These technologies were not arbitrary but rather loosely linked to the hegemony of the imperial regime of government, and its vague designs for remaking the people, territory and political economy of the Canadian West.

The picture is incomplete, however, without some account of the everyday discourses, which tended to construct the 'Indian' with a complex blend of exotic, noble, dangerous, and sympathetic discourses. This was a time, by and large, when the everyday circumstances of both the Indigenous peoples and the settlers were arduous to say the least, and there was little energy or enthusiasm for grand projects of racial assimilation from the general populous. Insight into such common sentiments is revealed by the tremendous popularity of the newspaper serial entitled *Two Months*. Released in Regina during the summer of 1886, one year after the Métis rebellion, and during the infamous trial of Louis Riel, *Two Months* told a fictional tale of two woman captured by a Cree tribe under a Chief known as Big Bear. Told as though it were an eyewitness account, it constructed a captivating contrast between the "vulnerable, threatened, frail, white

womanhood” and the ‘Indian’ women as “harried beasts of burden,” which were “powerful symbols of the shortcomings” of the Indigenous and non-Indigenous in the popular discourses of the local people (Carter 2002). The hegemonic discourse thus sustained a paternalistic, if condescending, popular ideological representation of the Indigenous peoples, which was assembled along side the disciplinary mentality and arguably acted as a sympathetic constraint upon the moral project.

These racialized and imperial discourses were coupled with a discursive construction of nature that may have been, in the end, equally decisive in constituting the Canadian West. As Mike Davis has explored in the *Ecology of Fear*, the scientific discourses of the nineteenth century endeavored to represent the environment of the North American West through a language and set of concepts developed in the North Atlantic. The Anglo-American terminology was specific to the humid, cyclical, orderly climate within which it had evolved. While this lusty geography fared well in the colonies of New England, it failed to grasp the radically different environment encountered in the western colonies. “Descriptions veered from garden to desert, fertility and sterility” as the climate oscillated between wet years and dry years (Davis 1998:11). This scientific discourse attempted to impose a picture of equilibrium and stasis upon the historical directionality of the environment of the West (Davis 1998: 15). On the Prairies, for example, geographers now assert that rivers will turn to dust whilst later flooding their banks and that the reliable flow of the rivers has historically fluctuated around 30 per cent of the mean, at minimum (Foster and Sewell 1981: 8). While the early colonial Anglo-American geographical discourse called for technologies capable of *normalizing* the Prairie ecology, it intersected with a political and environmental landscape constituted by

the imperial-hegemonic rationales as haven for rugged individualists of a frontier with largely subordinate political economy. The federal government did not reason it was worth while investing in environmental normalization. During the early colonial period, intervention upon the Qu'Appelle River consisted of roughly 196 individual (or private) and small group projects, from wells, to dugouts, spill off and drainage ditches and even several attempts at reasonably large dams (Indian Claims Commission 1998: xxxvii). Indigenous people rarely if ever acquired permission for the practices of damming and digging ditches and dugouts; of course, the overwhelming majority of these water projects were entirely unauthorized if not outright illegal anyway. These local practices coupled together with the lusty discourses of the North Atlantic trained experts, which held that the climate and landscape of the Canadian West were ecologically deficient, to inform a series of technologies designed not for irrigation, largely, but for the 'restoration of normal levels.' Problematically, for the individuals involved, there were many competing versions of this 'norm.' The principle of the Indian Industrial School at Fort Qu'Appelle, Mr. Hugonard, complained that:

compared to the large area draining into the Qu'Appelle Valley and the quantity of water it used to receive 10 or 20 years ago from the numerous creeks, very little now flows in, on account of the numerous dams on all the creeks ravines, some of which are very deep and bank-back the water for miles...previous to the creation of these dams on tributaries in the Qu'Appelle, the lakes and rivers used to rise from two to four to five feet every season, no such rise has taken place since 1894 and last year our lake did not rise two inches above [the] low water level of the previous year and then went down fully ten feet, leaving over one hundred feet of decaying vegetable and animal matter exposed in the bay in front of the school (ICC 1998: 1v).

Nobody, however, had the requisite knowledge to confirm these claims and, in any event, the available discourses only informed increased and no less scattered and chaotic intervention. Reconstructing this period, geologists and hydrologists now argue these

technologies had a negligible effect on the overall contours of the material and organic environment of the Qu'Appelle River system (ICC 1998; EBA 2003).

In every sense of the word, the governance of the water of the Qu'Appelle River during the early colonial period was privately administered. But intervention upon the Qu'Appelle River also frantically sought a notion of normality through an accelerating series of individual projects, *ad hoc* and informal arrangements between small groups of private property owners.

Juxtaposed to these sporadic efforts to institute the imperial regime was a multiplicity of indigenous knowledges and technologies which intermingled with, and in a sense served to resist, the hegemonic mode of water governance. Scholars have argued, recently, that the appropriation of resources like water was arguably the principle method of marginalizing Indigenous people (Armstrong 2003: 3). It is concluded that the systematic denial of the hunting, fishing and other cultural right encased in the treaties was accomplished through control over the resources need to sustain their 'traditional' livelihoods (25). In this case, however, local discourses proved quite resilient to the disciplinary expertise. Over time, the people of the reservations along the banks of the Qu'Appelle River managed instead to integrate indigenous knowledge and practices with that of the hegemonic imperial discourses. The result was a hybrid political ecology of considerable nuance, which was capable of producing both subsistence and surplus. The natural irrigation and seasonal flooding of the low-lying flat lands produced high yields of quality hay, which easily fed the burgeoning livestock held by the Indigenous peoples and generated revenue with the sale of the surplus. The hay trade also provided hauling and freight occupations (ICC 1998: v). Considerable advances were being made toward

the development of a diverse agricultural economy, which included, but was not limited to, grain production (Carter 1990). The bottom of the valley was populated by ample game, including beaver, muskrat, deer, rabbits, and mink, which were hunted for their food and tanning economies. Choke-cherries, 'Saskatoons,' high-bush cranberries, buffalo-berries, black currents, gooseberries, hazelnuts, and maple sugar were abundant and gathered from the valley bottom by the Indigenous peoples (ICC 1998: xciv). The valley was also an important source of traditional herbs of great medicinal and spiritual importance, such as sweetgrass and senega root. The water of the Qu'Appelle River was itself crucial to the economies of the Indigenous people, as it was used for potable, stockwatering and fishing purposes. More than an adequate source of timber and firewood was provided by the tree lined River. Somehow, describing this as 'marginalization' fails to capture the historical specificity and dynamism of this 'other' economy, which was integrated though hardly assimilated into the colonial regime. During the early colonial period on the Qu'Appelle River, the 'private' regime of water regulation actually served to limit the scale and scope of the efforts to assimilate indigenous governance into the imperial regime of water governance. The Indigenous population was able to adopt a strategy that countered the hegemonic discourses. Whilst they certainly did not strive to achieve any measure of counter-hegemony, the resultant constitution of the region was closer to the concept of hybridization employed by Arturo Escobar (2000), as modes of government exchanged and intersected with one another in complex ways to form a unique historical event. As a prologue, it should be mentioned that some have lamented the fact that the treaties articulated legal rights to resources such as water in racial terms, which, it is argued, ensured a measure of antagonism between

the groups and class of the region. However, as the regime of water governance shifts from 'private' to 'developmental,' the legal entitlements to water inscribed in the treaty will prove to be a crucial instrument in the Indigenous peoples struggle for their right to govern themselves differently.

Well, I'll tell you. You know this new photography process they've invented? It's called Pathé. It makes everything seem lifelike. The hues and coloration are magnificent. Well, then, what I would do, if I were custodian of your park, is I'd hire a dozen of the best photographers in the world. I'd build them cabins in the Yosemite Valley and pay them something and give them all the film they wanted. I'd say, "This park is yours. It's yours for one year. I want you to take photographs in every season. I want you to capture all the colors, all the waterfalls, all the snow, and all the majesty. I especially want you to photograph the rivers. In the early summer, when the Merced River roars, I want to see that." And then I'd leave them be. And in a year I'd come back, and take their film, and send it out and have it developed and treated by Pathé. And then I'd print the pictures in thousands of books and send them to every library. I would urge every magazine in the country to print them and tell every gallery and museum to hang them. I would make certain that every American saw them. And then...and then do you know what I would do? I'd go in there and build a dam from one side of that valley to the other and stop the goddamned waste!

- William Mulholland, 1925 or 1926³⁴

This portion of the case study will begin to explore the emergence of a distinct assemblage of discourses that reconstituted the governance of the Prairies as the hegemonic formation shifted from an imperial to a developmental regime. It will conclude with an examination of their specific intersection upon the Qu'Appelle River. With a population close to one third its current size, Canada rapidly disbanded what was, at the time, amongst the largest armies in the world from "669,000 in 1944 to less than 40,000 in the early post-war years" (Berton 2001: 504). At a cost of approximately 18 billion dollars, the war had subsumed 80 per cent of a federal budget that had been

³⁴ William Mulholland (1855-1935) was the Jeremy Bentham of post-war governance in the American West, with unequivocal ties to the construction of the water infrastructure in Los Angeles and southern California. These remarks were recalled in 1980 by Horace Albright, the National Park Service director under Herbert Hoover. They were uttered by Mulholland to Albright at a party, in 1925 or 1926, he could no longer remember the exact year, while Albright was serving as a young park superintendent (Reisner 1993: 91,92, emphasis in the original)

amplified considerably over the course of the war (Findley and Sprague 2001: 434). The knowledge and political economy of the state had expanded rapidly, and they were now turned inward. The Prairie region of the Canadian West was encountered by newly formed sets of engineers, planners, and apparatuses of authority. In a manner analogous to the discourses that would form a grid of understanding over the so-called third-world, these experts encountered new problems to which their knowledge spoke clearly: “poverty, insufficient technology or capital, rapid population growth, inadequate public services, archaic agricultural practices” (Escobar 1995: 41). There were also more familiar problems to which their knowledge spoke “not so clearly, or cautiously: cultural attitudes, values, racial, religious, ethnic, geographic factors believed to be associated with backwardness” (159). The frontier was imagined as *underdeveloped*.

It would be inaccurate, though, to imagine that such a shift was simply imposed from above. As with the nineteenth century projects of moral regulation revealed by Alan Hunt (1999a), social movements and the middle-classes would play a decisive role. The ideologies of the region’s historic bloc mutated as petty-bourgeois farmers and the growing mass of working classes were politically radicalized by the depression of the interwar years. In Saskatchewan, the hegemonic discourse of development would be coupled with the counter-hegemonic tones of the Co-operative Commonwealth Federation (CCF). From 1930 to 1937, the Prairies experienced severe drought and unprecedented crop failure, which was further exacerbated by the worldwide depression and the concomitant deflation of commodity prices. Over the course of eight years, wheat prices fell by an average of 70 per cent over eight years (ICC 1998: x1v). Under the leadership of Tommy Douglas, the CCF drew from Christian universalism and

socialism to shift the problematic. The problem facing the Prairies was no longer one of a cruel nature which was to be endured and normalized tentatively within an ethic of rugged individualism. The problem was now imagined as intrinsic to the structure of the capitalist political economy of Canada, and, importantly, it could be rectified. During a 1942 public radio address, Tommy Douglas summarized their contention with this cogent metaphor:

I have often likened the present capitalist system to a cream separator. The farmer pours in the milk - he is the primary producer without whom society would collapse. Then there is the worker - he turns the handle of the cream separator - and it doesn't matter whether he is a coal miner, a railroader, or a storekeeper, it is his labour which makes our economy function. The farmer pours in the milk and the industrial worker turns the handle.

However, there is another person in the picture - he is the capitalist who owns the machine. And because he owns the machine it is run exclusively for his benefit - that is why it is called a 'capitalist' system. Now the capitalist doesn't put in any milk nor does he turn the handle. He merely sits on a stool with the cream spout firmly fixed to his mouth while the farmer and the worker take turns on the skim milk spout (Richards and Pratt 1979: 99).

In this way the CCF harnessed the discontent of the urban working classes to the discursive formations of rural petty bourgeoisie and their burgeoning agricultural collectives, and their combined influence steadily began to grow throughout the apparatuses of the government of the Canadian West. This discourse coalesced well with the shifting orientation of the hegemonic regime, which served to guide the more radical notions of the CCF ideology toward the goal of limitless social and economic expansion.

"Tommy Douglas was a liberal in a hurry," Trudeau is reputed to have said somewhere. The resultant governing formation was to funnel knowledge and capital into the land through massive infrastructure projects and the general construction of an urban/industrial built environment of production and consumption. Knowledge of the condition of the population was constituted through the creation of social infrastructural

programmes of health and education. And overall the spaces of governance and the technologies of intervention were increased significantly.

These developmental discourses would intersect with a new framework within which to interpret nature, a grid of understanding that Valerie Kuletz has called the 'geography of sacrifice.' The lusty geographic discourse of desert normalization was incorporated by this emergent understanding in which eco-regions came to be problematized along a spectrum of development. As Kuletz explains, the emergent "environmental science often supports the pre-existing scientific discourse about desert lands as barren wastelands by organizing bioregions within hierarchies of value according to productive capacity, in which deserts are paced at the bottom" (Kuletz 1998: 13). The problematization of the Indigenous peoples began to shift as well as it was coupled alongside the discourse of development and the geography of sacrifice. The resultant mentality is evident earlier on in this statement from an Indian agent, G.F.G. Stanley, 1920,

[The] Indians fundamental problem was that by upbringing and character they were unable to compete with the whites in competitive individualism and to share with them in the duties and responsibilities of citizenship, they wished to maintain traditional values incompatible with development, content to live off relatives and the government (Carter 1990: 4).

In this way the Indigenous people and their mixed economies of subsistence and surplus came to be located in discursively constituted wasteland regions which were placed at the bottom of this geographical hierarchy.

The linkages of these discourse would collide upon the 'chain lakes' portion of the Qu'Appelle River, which was to become a place of leisure by the urban dwellers of nearby Regina and Moose Jaw and the geographical imagination of the Canoeist. The Prairie Farm Rehabilitation Authority (PFRA), a regional development organization

under the umbrella of the agriculture and agro-food division of the federal government, constructed a series of dams along the Qu'Appelle River³⁵. The engineers believed, without the benefit of detailed surveying, that the dams would restore water to their 'normal' levels and facilitate leisure practices such as camping, boating and hunting, which would make the area more attractive to cottagers (EBA 2003). The dam technology was used to construct a political economy of recreation in southern Saskatchewan for the emerging middle classes. For the reservations of the Indigenous peoples, the construction of these dams led to the continuous flooding of some areas, while other areas were subjected to occasional flooding, which either aggravated harvesting efforts or made resources altogether inaccessible. The occasional flooding damaged the Qu'Appelle Valley's ecology through both capillary action and salinization, while the permanent flooding of other areas starved the vegetation of oxygen (ICC 1998: vii). Over time, the nutrient-rich vegetation and diverse biology of the river valley was replaced with that of saline plants and dramatically reduced wildlife. Consistent with the developmental ethos, water infrastructure was continuously expanded. In 1968, the Gardiner dam was completed upstream on the South Saskatchewan River, in order to further facilitate the industrialization and urbanization of the province. In the early 1980s, this led to the channelization of the Qu'Appelle River in order to try and improve the flow of the increasing amount of urban effluents and industrial run-off that was now making its way to the River from nearby Regina and Moose Jaw, as well as to move along the agricultural contaminants that were beginning to accumulate in the artificially

³⁵ Six control structures were built, encompassing Buffalo Pound Lake, the four fishing lakes of Pasqua, Echo, Mission and Katepwa Lakes, as well as Crooked and Round Lakes. In all, the project had a total storage capacity of 105,150 acre-feet of water. At the time, it was considered a major project relative to the resources of the region (ICC 1998: 1ii).

enlarged lakes. The length of the River was shortened and the steepness of its grade was increased (EBA 2003: 20). The banks carved by the meandering Qu'Appelle River were bypassed and consequently the habitat, feeding and shelter areas were considerably reduced, while the increased velocity of the water obstructed the passage and spawning of fish. The 'other' economies of the Indigenous peoples were considerably affected by these developments. By 1962, a staggering 80 per cent of the Indigenous population in the region was dependent on welfare (Stonechild 1982: 2-104). This marginalization eventually led to a mass exodus that peaked in 1970 by which time an estimated 41 per cent of the total population had left, which only further undermined the economic viability of the reserves (Stonechild 1982: 2-105).

In 1969, a year that not coincidentally coincides with the publication of the Trudeau administration's White Paper on Aboriginal assimilation, the six Indigenous reservations formed the Qu'Appelle Valley Indian Development Authority (QVIDA) in an attempt to wrest back a measure of control over the water and the way in which they are governed. Their organization speaks of resistance through the language of development, condemned as it were – to speak the truth. The Indigenous people have also continuously asserted their right to govern the water based upon the treaty signed some 130 years previous. Demonstrating the importance of legal rights in counter-hegemonic struggles they have also initiated a lengthy court battle against the local, provincial and federal government for the right to a just measure of control over the Qu'Appelle River's water. And in the summer of 2003, when their court case seemed ready to collapse, the QVIDA denied the Saskatchewan Watershed Authority access to the land conferred by their treaty and delivered an ultimatum to the government – surrender control and provide riparian rights

or the dam structures will dismantled and removed, and this will be followed by legal action over the costs of land reclamation.

IV. Concluding Remarks

The purpose of this brief genealogy of the government of water on the Qu'Appelle River was not to provide an encyclopaedic inventory of every discourse and practice of relevance but rather to explore the complexity and contingency of the history of water governance in the Canadian West more generally. The overlapping geographical imaginations of empire and capitalism and canoes explored in the first chapter were dissected to reveal projects of governance launched from below, above and in between: Indigenous groups, working and middle-classes, petty bourgeois farmers, distant and local governments. A monolithic state did not emerge with a clear link to a unified economy. The lines through which the history was traced were muddy and blurred. There were subsistence and industrial economies, petty bourgeois and working class politics, national policies and international recessions. The government was under the influence of expert knowledge and hegemonic practices which shifted from strategies of imperialism to developmental grids of understanding. Neither regime exuded a high level of coherence; though perhaps the increased power of knowledge and technology at the disposal of the latter led to a more decisive shaping of the contours of nature. With too little argument, perhaps, I suggested contemporary social theory (e.g. Beck 1999; Urry 2000) had uncritically adopted the notion of a singular and global Nature. This limited genealogy of the Canadian West demonstrated the problem with such an approach, as not merely geographical imaginations but also natural realities overlapped, were subjected to procedures of normalization, sacrifice and intensive cultivation and

expansion. In conclusion, judged by history, it is not only possible to imagine that the government of people and water could be achieved through different means and toward different ends, it is almost inevitable. This should not be construed romantically; there is little to suggest that the governance of water and people will one day be good again. The knowledge and practices of the Indigenous peoples explored above often exhibited a high degree of complexity and specialization, which had adapted to the local material and organic environment in manner that might be said to resemble the 'organic' relationship with nature conceived of by Escobar (1999) and Shiva (2002, 2002a). However, this indigenous mode of governance was not ahistorical; it was vulnerable and susceptible to internal and external forces of change; practices and knowledge were appropriated if considered useful in certain contexts, imposed in others, and in all cases the results were partial and hybridized modes of government. In sum, while it is possible and quite probable that the government of water and people in the Canadian West will assume a different shape in the future, power will likely be exercised in a form unanticipated even by those who seek now to constitute it.

Chapter five: down to the last drop?

Easter Island proved to cold for breadfruit and coconut palms, but it was rich in seafood: fish, seals, porpoises, turtles and nesting seabirds. Within five or six centuries, the settlers had multiplied to about 10,000 people – a lot for sixty-four miles. They built villages with good houses on stone footings and cleared all the best land for fields. Socially they split into clans and ranks – nobles, priests, and commoners – and there may have been a paramount chief, or “king.” Like Polynesians on some other islands, each clan began to honour its ancestry with impressive stone images. These were hewn from the yielding volcanic tuff of a crater and set up on platforms by the shore. As time went on, the statue cult became increasingly rivalrous and extravagant, reaching its apogee during Europe’s high Middle Ages, while the Plantagenet kings ruled England.

Each generation of images grew bigger than the last, demanding more timber, rope, and manpower for hauling to the ahu, or alters. Trees were cut faster than they could grow, a problem worsened by the settlers’ rats, who ate the seeds and saplings. By A.D. 1400 no more tree pollen is found in the annual layers of the crater lakes: the woods had been utterly destroyed by the both the largest and the smallest mammal on the island.

We might think that in such a limited place, where, from the height of Tereveka, islanders could survey their whole world at a glance, steps would have been taken to halt the cutting, to protect the sapling, to replant. We might think that as trees became scarce, the erection of statues would have been curtailed, and timber reserved for essential purposes such as boatbuilding and roofing. But that is not what happened. The people who felled the last tree could see it was the last, could know with complete certainty that there would never be another. And they felled it anyway. All shade vanished from the land except the hard-edged shadows cast by the petrified ancestors, whom the people loved all the more because they made them feel less alone.

- Ronald Wright, 2004³⁶

I have yet to encounter a more vivid illustration of the dangers and limitations of the imposition of imaginative orthodoxy than that which is described by Ronald Wright above. I have thus far said little of the intellectual milieu in which I currently research and write, though the philosophical tenor of this paper has likely betrayed the character of this context. Grand theory is dead; it is social theorists that have rendered this beast extinct; and, in all likelihood things will remain this way for some time. My peers were terribly upset last semester when the Department of Communications scooped their

³⁶ An excerpt from Ronald Wright’s 2004 Massey Lecture; appropriately titled *A Short History of Progress* (Wright 2004: 59, 60, emphasis in the original).

graduate conference title: 'After Theory.' To a certain extent, the criticisms launched against attempts to explain water governance through elaborate theoretical models in this thesis have echoed these sentiments. And yet, in another sense, the philosophical and analytical offerings found herein suggest that it is possible to speak in general terms, to explain, to predict, if on more modest, empirically and historically grounded terms. Although Wright works from a perspective and with the concerns of a scholar trained in the discipline of anthropology, the concept of government put forward in this thesis is not entirely different than the rather expansive concept of *culture* found in most archaeological investigations. Knowledge, practices and beliefs or, perhaps better, goals and objectives, are still useful analytical tools for generating an understanding how people have gone about making up their history, shaping the contours of their material and organic environment, and seeking shape both their own conduct and that of others. At the bequest of Michel Foucault (1991a, 1980), I have suggested that a particularly important feature of modern culture is power. Power, as exercised through discourse and knowledge, technology and practices, has expanded considerably over the course of the past two centuries. As the case study of the Qu'Appelle River demonstrated in stark relief, the capacity of the post-war epoch to intervene upon and shape natural and social processes is unprecedented. Indeed, when the intellectual milieu of the nineteenth century North Atlantic was explored in chapter two, it was revealed that the meaning of what it is to live and breathe as a *modern being* is intimately tied to this experience of social and natural change as both rapid and unrelenting.

The misadventures of Karl Marx (1966, 1966a) and Karl A. Wittfogel (1957, 1970) in a theory of the supposed pre-history of the Orient established the dangers of trying to

explain the history of water government by flattening it; the rationales and technologies of the present were superimposed on to the ancient past in order to explain the purposes served by the invention of the state-hydraulic complex. The result was unconvincing. The attempt by Donald Worster (1985, 1991) to resuscitate the state-hydraulic hypothesis in order to revise and better explain the history of modern water governance revealed problems of a different order. There is no singular reality of water 'out there' but rather multiple experiences of nature, facilitated by overlapping geographical imaginations which both confront and result from political struggles and strategies. Nor is there a monolithic capitalist economy, state or bureaucratic structure from which the constitution of these discourse and practices can be explained. The will to govern emerges from social movements which can be characterized as everything from subaltern and hegemonic to somewhere in between. But neither does this mean that the time has come to write the conclusion of the government of water by the public or its representatives. The dire prognoses of the Oxford School remain premature. The imperatives of capitalism and the logic of capital, powerful forces though they may be, have yet fully undermine what can at least ostensibly be called the public government of water. By and large, we can blame each other, if some more than others, for the present state of affairs.

Nonetheless, if the genealogy of the history of water governance reveals anything it is that there is little sense in waxing nostalgically over the loss of an 'organic' connection between the natural and social spheres. Before mourning with Bakker (2003) the loss of social entitlements to water apparently ensured by the welfare state, or seeking out a vernacular imbued with a greater reverence for cow dung (Shiva 2002a), it is important to remember that the marginalization of Indigenous peoples was accelerated by welfare

state-led regimes of 'development,' and the etymology of words like 'ecosystem' in classical political economy must be recalled in order to capture their full meaning and effect. Instead, we might seek to imagine, with Ronald Wright (2004), just what went through the mind of that Easter Islander as he or she felled the very last tree in their entire world? In all likelihood it was neither romantic reverence nor the logic of capital but rather the experience permitted by the imagination as practiced and expressed in the ways in which the people of Easter Island governed their world. And so the last tree fell. As Joel Kovel (2002: 89) put it, succinctly: the point is that we have to come to terms with the fact that nature can only exist for us to the extent that our knowledge and practices make it intelligible and practicable.

Philosophical relativism, which conceives of people's reality as relative to the practices and discourses through which it is brought into existence, does not necessitate moral relativism. The truth about people's problems is contingent upon the moral claims and political struggles that make such problems conceivable. But the problems related to the manner in which we now govern water are nevertheless real. Water has been placed at the disposal of gendered, racial and class exploitation, marginalization and domination. Water has become increasingly entangled in the manifold lines of intervention into the lives of people and nature which, in a manner quintessential to the modern epoch, are simultaneously pernicious, violent, immanent and ephemeral. Indeed, what makes the study of water so important to the study of the exercise of power more generally is the way in which it reflects the dangers inherent in the Janus-faced character of modern government. There is little denying, moreover, that during the second half of the past century, the flow of surface- and ground-water captured, consumed and used increased

threefold (Harper 2001: 88). And what makes this reality so overwhelming is the way in which our regime of governance ascends from the mundane practices of everyday life in which we all engage and, to a large extent, believe in. This does not excuse cynicism, and scholars and researchers must strive to warn of the dangers contingent upon the way we think about and seek to govern. We could conceivably extinguish a fresh water supply in the coming decades that was constituted over the exceedingly long course of geological time.

For all the hyperbole that accompanies the science wars behind the so-called water wars, the wellspring of my optimism is rooted in the knowledge that there is an undeniable struggle under way to redefine how water is to be constituted as an object and what will count as knowledge about water. Ideas have gone public (Hacking 1997). While expert discourses appear to be more and more the intellectual property of corporations, they are not the only source, nor arguably the salient source, historically, of inspiration for the implementation of change. We can also take a form of perverse comfort in the resolute failure of the people of Easter Island to govern their world. Projects of governance are rarely complete (Hunt 1999a). When judged by their own expressly stated goals and desires – the subordination of a region, the constitution of one population and the assimilation of another, the normalization and then development of nature – the government of people of water in the Canadian West is marred with partial failures and marginal successes. Therein lays the danger and opportunity of government. In a sense, the analytical study of government reveals that no matter how laudable or reprehensible the aims of the exercise of power: projects of government are invariably incomplete. Not only is resistance and protracted struggle to be expected, though not

unconditionally praised, it should be expected; it is often these attempts to envision how we might be governed otherwise which make the salient contribution to how we will be governed. And while I do not propose to tell people what to do, this thesis does aspire to be a tool for those who might wish to effect a mode of government through which we might learn to govern ourselves and water differently; that is, hopefully, according to an ethic more suitable to the many lives and natures people may some day desire. I would like to close with the modest proposal of Kate Soper (1996: 31), which I offered earlier as an appropriate moral imperative for a thesis concerned to examine the links between the government of people and the government of water: “what is really needed, one might argue, is not so much new forms of awe and reverence of nature, but rather to extend to it some of the more painful forms of concern we have for ourselves.”

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