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Constructing the water works, constructing the narrative

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CONSTRUCTING THE WATER WORKS, CONSTRUCTING THE NARRATIVE

by

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The first decades of the 20th century were a great period in urban municipal politics that gave rise to the modern theory and practice of public health. In Toronto, the iconic R. C. Harris Filtration Plant (1941) stands as an emblem of modernity and the marvels of hydraulic engineering that assured every citizen of the social right to clean water. We no longer celebrate the material networks of water supply such as R.C. Harris and his public works department fought to achieve; filtered H2O has become another commodity with no reference to the production process. In this thesis I explore the local, historical specifics of water issues embedded in this site and suggest ways that they might contribute to the renewed visibility of hydraulic infrastructure; a re-imagined materiality that might in turn inspire a more sustainable, collective water citizenship.

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For Dave Smythe

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Introduction

Water throughout history has been perceived as the stuff which radiates purity:
H2O is the new stuff, on whose purification human survival now depends.
H2O and water have become opposites: H2O is a social creation of modern times,
a resource that is scarce and that calls for technical management. It is an observed
fluid that has lost the ability to mirror the water of dreams.
Ivan Illich*, H2O and the Waters of Forgetfulness* (1986)

When I was in my late teens I moved to Hamilton, Ontario for a number of years. During my first week there I went for a long trail run through an area bordering the city known as Coots Paradise. It was a hot, muggy afternoon in September and having spent all my summers swimming in Northern lakes I was delighted to come across a clearing in the trees which revealed a small beach, and a sizable body of water. The sun sparkled, the lake albeit murky, beckoned and I rushed back home to get my swimsuit. Exhilarated by the day and my discovery I jumped in and surfaced to the screams of several passersby waving and yelling frantically at me to get out of the water. It seems I was literally swimming in shit. Coots Paradise is a large wildlife sanctuary and coastal wetland at the western end of Hamilton Harbour owned and managed by the Royal Botanical Gardens. Three large creeks (Spencer Creek, Borer's Creek and Chedoke Creek) flow into its drainage basin along with numerous other smaller streams. More pertinent is the fact that both the "Dundas Sewage Treatment Plant and several Combined Sewage Overflows" also discharged into Cootes Paradise and incidentally still do (www.rbg.ca). Mortified and repulsed I hurried home to douse myself in soap under a steady flow of hot water. Waves of disgust engulfed me as I scrubbed at my skin, imagining the ingestion of foreign matter and fecal waste bobbing in those fouled waters. This was the start of a personal journey into the subject of water and by extension sewage and sanitation. My visceral, panicked response to this experience provoked all the predictable angry questions one

might expect. How could it be that this *lake-in-a-woods* was a receptacle for raw sewage? Who was responsible and why were they not punished? Self-righteous as I may have been that marshy baptism stayed with me. Years later I began to connect those swampy waters with the governed cycle of urban water supply and sanitation, with the engineered journey water makes from sites of production to sites of consumption and the collective cultural conventions that surround them. In this thesis I attempt to unpack these linkages, to understand the inescapable fact that we shit in our drinking water, that fresh water is a finite managed resource and that all of us are at once both watery beings and waste making organisms.

The Earth itself is a water planet covered in rivers, lakes and oceans, polar ice sheets and high altitude glaciers. The ocean alone accounts for 71 percent of its surface and 97 percent of our water supply. Fresh water accounts for the remaining 3 percent, but since most of that is in a frozen state, we are left with 1 percent available for the planet's consumption through drinking, agricultural irrigation, industry and household use. The composition of the human body is 67 percent water and ideally requires approximately 1.75 litres of water per day; we can survive less than a week without drinking it at all. Under the strain of population growth coupled with unsustainable demand, mismanagement via distribution problems and pollution, our supply is falling short and the world is beginning to feel the effects of a fresh water crisis. In the post-industrial age of "free market democracy and neoliberal global economic policies" (Jung 441) this resource upon which human survival most depends, has become a contested commodity, and the cultural politics around its access and allotment are characterized by fierce debate.

In this thesis I interrogate the local, historical narrative of Toronto, Ontario's monumental R.C. Harris Filtration Plant as a way of anchoring my contribution to the contemporary discourse around water as a commodity, and the political economy of water on a global scale. Roland Caldwell Harris was Toronto Public Works Commissioner from 1912-1945 and is credited with creating the city's network of water reservoirs, sewer trunks, and filtration plants, of which the most notable was the extraordinary Victoria Park Pumping Station (renamed the R.C. Harris Filtration Plant after he died). Officially opened in 1941, the so-called "Palace of Purification" sits on a bluff at the eastern end of Queen St. overlooking Lake Ontario. Still functioning though now fully automated, this civic structure pays tribute to the modernist dream of progress and social change, pumping out two hundred million gallons of water daily through two intake pipes below the lake bed that stretch almost three kilometres from shore. The processes of pumping, filtration and chlorination reconstitute raw water into a potable commodity before sending it out to journey through miles of hidden pipeline to the city's domestic front and other sites of consumption.

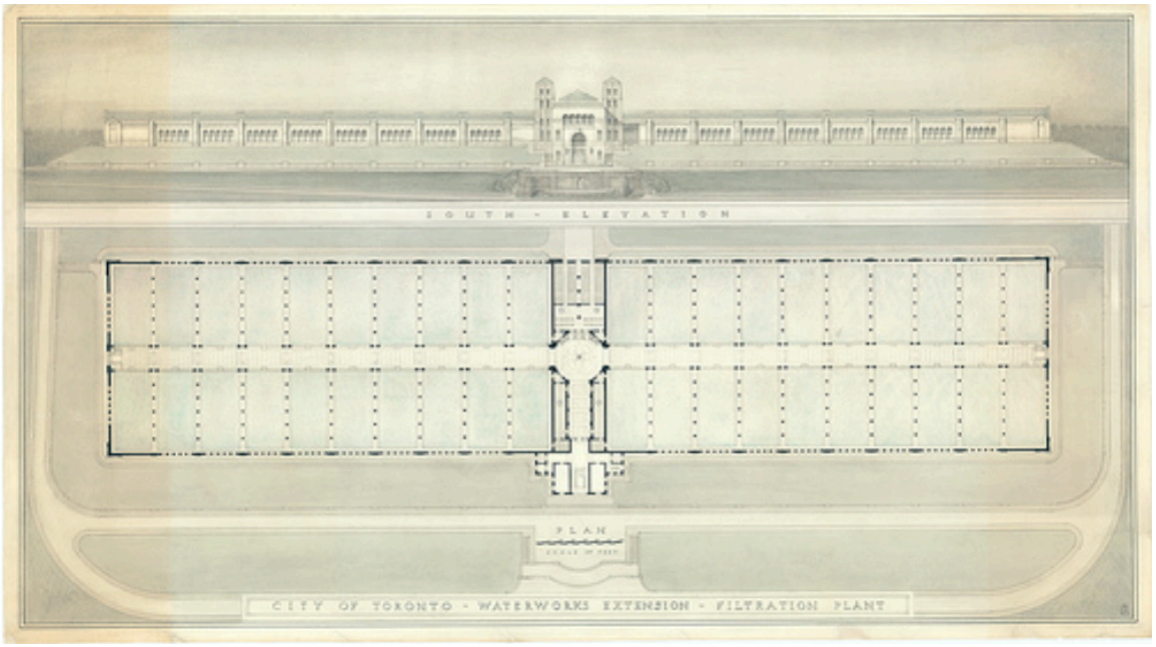
Richard Johnson depicts cultural studies as "a process, a kind of alchemy for producing useful knowledge", and further that culture can been seen as a "kind of summation of history", an analysis of power and social possibilities (40; 42). My uncovering of the Harris plant historical record is a process theoretically influenced by this idea. By probing the building as cultural text and public monument I create a 'kind of alchemy' and in turn uncover both useful knowledge and social possibilities relevant to establishing a collective water citizenship. This exploration is also informed by the strong relationship

between cultural studies and human geography. Both disciplines are influenced by the geographical attention to space and the culture of location. I unearth the specificities of the Harris site and its "collective and sedimented history" (Lee 127) and contrast it to the more general notion of globalization. Using a socio-cultural approach I contribute to the work of Zoe Sofoulis (2005), sociologist Elizabeth Shove (2003), and anthropologist Veronica Strang (2004) and forge links to Gay Hawkins' analysis of culture and waste (2003) and geographer Maria Kaika's writings on modernity, nature and the city (2005). I am also influenced by human geographer Nuala C. Johnson who has written extensively on the politics of memory and the social and cultural meanings attached to public monuments.

French philosopher Bruno Latour states in *Dingpolotik* that, "Objects become things, that is, when matters of fact give way to their complicated entanglements and become matters of concern" (41). Each object or issue "issues a different pattern of emotions and disruptions, of disagreements and agreements" and gathers around itself a different assembly of relevant parties" (15). In many ways the politics of fresh water supply and distribution has developed from a substance, mechanized and ordinary, into a "thing" whose complex entanglements have rendered it a "matter of concern" in the 21st century, the management of which has sparked a deeply polarized debate. The water privatization discourse is framed by a neoliberal political economy under the auspices of the WTO, the World Bank and the IMF, yet all local socio-ecological systems are ultimately connected globally, and water traverses national borders with impunity. By mining the historical narrative of the Harris Filtration Plant built in a very, water rich city I deploy the local water issues of the 1930s and the modernity project as an avenue

towards establishing new understandings of water's cyclical path—understandings that can inform our present and our future. By recovering the tracings and mapped fictions of collective civic memories inherent in this high functioning public monument, I reveal the pertinent political, economic, and environmental issues and make visible some of "the dreams, myths, and cultural perceptions that shape our relationship with water" (Reuss viii).

Sifting through stories and struggles around the construction of the R. C. Harris Filtration Plant helps to establish the historical narrative of the plant's form and process from its genesis in the mind of Commissioner of Public Works R.C. Harris, to its construction and operation and its continuing presence in the public imagination. I employ this narrative as a methodological tool, or leitmotif to help theorize attitudes toward the contemporary commodification of water, the freshwater global crisis and our collective daily water rituals. In constructing the local, historical narrative I cross-reference newspaper articles with the municipal archival records to uncover the sediment of the early 20th century socio-cultural landscape in order to open up a space in which to view the relationships and differences between Harris' time and the current culture of commodities both in Toronto and in the global forum. I use a mixed methods approach involving a political economy analysis, rich textual analysis and a material cultural approach to address these questions. By reclaiming civic memories embedded in the Harris site, I forge linkages with the current discourse around water commodification and citizenship.



T.C. Pomphrey, *Rendered ink-and-wash drawing of the filter/administration building and the terrace at Victoria Park* 1929.

CHAPTER TWO
Literature review

Water is so closely related to the development of human groups that it becomes entangled in their social world, for which it constitutes a central link.
Jean-Pierre Le Bourhis, *Water Parliaments: Some Examples* (2005)

An enormous volume of literature has been written about water, its history and symbolic meanings, its flows and chemical makeup, and the consumption, supply and management of it as resource. This global discourse spans all academic disciplines, permeates both national and international governing bodies, as well as the work of activists, journalists and non-government agencies. In exploring the construction narrative of the iconic R.C. Harris Filtration Plant through a socio-cultural lens, I build on elements of this vast discourse, contributing through a historical perspective to an understanding of the issue of the water's commodification and cyclical nature. By taking a socio-cultural approach influenced by cultural and human geography studies (Bakker 2003, 2007; N. Johnson 2002; Kaika 2005; Swyngedouw 2004) to a local, historical narrative, I contextualize issues of water governance and commodification.

The dominant theoretical perspectives in this stream include a political economy approach (Barlow and Clarke 2002) that examines the journey from sites of production to sites of consumption (Kaika 2005); a sociotechnical perspective (Sofoulis 2005); and commodity theory as applied to water (McDonald & Ruiters 2005; Bakker 2003, 2007; Rose 2004). Connected to this work is the related topic of water governance (Conca 2006) and the interrogation of fresh water in terms of flows of power and visible networks that reveal the intersections of modernity, nature, and the city (Kaika 2005; Swyngedouw 2004). Cultural theorists Fiona Allon and Zoe Sofoulis (2006) stress the importance of investigating the ordinary, unspectacular dimensions of daily life, that have

become inconspicuous practices of consumption. Similarly, sociologist Elizabeth Shove (2003) probes water consumption patterns buried in the realm of normalised practice. Anthropologist Veroncia Strang (2004), Gay Hawkins in her cultural research on the nature of waste (2003, 2004) and cultural historian Jean-Pierre Goubert (1989) all adopt a similarly focused cultural approach.

In this context I will construct the Harris Filtration Plant narrative, a site well known from its role in Canadian Michael Ondaatje's novel *In the Skin of a Lion* (1988). This monumental public work is embedded with local water issues, civic memories and traces of the political socio-cultural currents of the 1930s. My interpretation is inspired by geographer Nuala C. Johnson's work (2002) on the concept of social memory and the ordering of public collective memory around public monuments and sites of collective remembrance (294). She states:

> The materiality of a particular site of memory sometimes masks the material social relations undergirding its production by focusing the eye on its aesthetic representation independent of the sometimes less visible ideas (social, economic, cultural power relations) that underpin the final product. (296)

Political scientist Richard Dagger defines 'civic memory' as the shared "recollection of the events, characters and developments that make up the history of one's city or town" which both reflects and generates a sense of civic identity (Dagger 37). Large urban centres have a fragmented and fluid population base, contributing to the loss of civic memory, "the memory that, by tying its residents to the past of a city, enables them to play a part in its present and help shape its future" (25). Dagger argues that this failure of shared civic memory contributes in turn to the failure of citizenship.

The early decades of the 20th century boasted large-scale civic infrastructure expansion and grand feats of hydraulic engineering. The new technology was admired and fetishised, "promoting the myth of progress and modernization as an automatic means of producing a better society" (Kaika 6). Gleaming pumping stations, the process of chlorination and the health miracle it produced, and state of the art equipment were widely reviewed and reported on in the engineering science journals of the time including: *Contract Record and Engineering Review*, *Canadian Municipal Utilities*, and *Water Works & Sewage* all of which covered the Harris site. Roland Caldwell Harris was an intensely private man and beyond the basic details his life is not extensively documented. However the water issues of late 19th century and early 20th century Toronto (Anderson 1988); (Baldwin 1988); (Jones and McCalla 1979) and the roots of the city's public utility model (Armstrong and Nelles 1984); (Middleton 1923) provide the social, political and cultural context in which Harris laboured. Toronto newspapers *The Globe* (the *Globe & Mail* after 1936), the *Toronto Evening Telegram* and the *Toronto Star* all chronicled the progress of the Harris and his Toronto Water Works Extension project (1912-1945) and the visionary Victoria Pumping Plant (*R.C. Filtration Plant*). A visual record of this period can be found in the thick collection of archival photographs taken by the city's official photographer Arthur Goss, and through the writings of Toronto design and architectural critics John Bentley Mays (1994, 2006), Christopher Hume (2001, 2007) and Steven Mannell (2002, 2008) all of whom have a keen interest in the R.C. Harris Filtration Plant.

In the postwar period fouled local creeks and streams were buried underground and visual signs of water infrastructure and the production networks that produce

domestic comfort thereby excluded from the visible urban landscape. In the following chapter I will look at the political economy of water and the cyclical, unseen journey it makes as it flows from sites of production to sites of consumption, changing "its physical, socio-political and cultural character" (Kaika 6) in the process. Drawing on the work of geographers (Kaika 2005, Bakker 2003, 2007), an anthropologist (Strang 2004), social and cultural historians (Benidickson 2007; Goubert 1989;) and Laporte's poststructuralist history of shit (1978) I examine the legacy of sewage and the conquest of water. I link the Toronto water narrative to the history of the water carriage system and the sanitation movement of the 19th century which worked to remove sewage from the urban gaze and not coincidentally, the municipal consciousness.

In Chapter five I survey the intersections of our current culture of commodities, global neoliberal policies and the water privatization debate. Karen Bakker defines the privatization of water specifically as:

> an overlapping set of strategies - industrialization of water supply production, the territorialization of corporate power in zones where a high degree of non-corporate activity already exists, and the internationalization of control of water supply. (*Archipelagos and Networks* 339)

The commodification of water and the idea of water being treated as a traded good is often seen as a kind of violence (McDonald & Ruiters 2005; Bakker 2004; Rose 2004). Reflecting this view, the water privatization debate is complex, global in scope, and intensely political. I have utilized the burgeoning non-academic literature on water justice, including the work of Canadian Maude Barlow, senior advisor on water issues to

the UN (2003, 2007) and other activists and social critics (Black 2004; Ridgeway 2004; Shiva 2003; Villiers 2003) to illustrate the politically charged nature of this debate, the emerging counter concept of the commons, and the struggle for public control of water utilities.

The culture of commodities and the push for privatization have informed the Canadian national debate on the subject of healthcare, transportation and electricity. Similarily many public utilities in Europe, Latin America and sub-Saharan Africa, highly criticized for "their lack of productive efficiency, their failure to identify consumer demands, and their lack of service innovation" (Heritier 2002, 995) have turned to the private sector for solutions. The influence of neo-liberal thought is frequently cited as the ideological justification (Cheru, 2001; Heritier, 2002; Loftus & MacDonald, 2001; Prudham 2004) for this "privatization tidal wave" (Grunsky, 2001; Mudock 2000). Central to the water privatization debate is whether water is to be defined as a common resource outside the realm of property relations, or an ecological commons that "is not a human invention" but a natural right that "cannot be bound and has no boundaries" (Shiva 36), based on a human need that can therefore be treated as a commodity or private good.

In Chapter six I examine the domestic sphere and our veiled interface with water infrastructure drawing from the work of British sociologist Elizabeth Shove (2003), Australian cultural theorists Zoe Sofoulis (2005), Fiona Allon (2006) and Gay Hawkins (2003, 2004), as well as that of social anthropologist Veronica Strang (2004) all of whom argue that the notion of infinite supply is folded into the material form of domestic plumbing. Allon and Sofoulis scrutinize the rituals of water use that have become

inconspicuous practices of consumption (47). Sofoulis uses an applied cultural approach in her case study of Western Sydney to examine domestic water habits embedded "in the meaning-laden contexts of everyday life" which arise from cultural and social conventions (447). I have found Australian theorists in general to be more radical in pressing for cultural change, as they live under the constant threat of drought. Shove, too, interrogates the sociology and technology of routine water consumption, while Hawkins links waste and sanitation processes with cultural consumption practice. All argue that water infrastructure has become invisible today and with it, the reality and consequences of our collective water practices are also hidden from view.

My Conclusions summarize the patterns and issues found in the Harris site narrative and suggest ways that they might contribute to the visibility and meanings embedded in civic hydraulic infrastructure and in turn inspire a more sustainable collective water citizenship.

Victoria Pumping Station. City of Toronto Archives, Subseries 77 Item 56
November 18, 1935

CHAPTER THREE

The Palace of Water: Constructing Toronto's R.C. Harris Filtration Plant

We will then think the past against the present and resist the latter, not in favour of a return but "in favour, I hope, of a time to come" (Nietzsche), that is, by making the past active and present to the outside so that something new will finally come about, so that thinking, always, may reach thought.
Gilles Deleuze (cited in C. Boyer, *The City of Collective Memory* 1996)

After the carnage of the Great War, Roland Caldwell Harris and his visionary public works department ushered in the glory days of Toronto's municipal government. A period of vast and ambitious expansion gave local government both the authority and affluence to invest in large scale, urban public schemes. The sprawling deco monument to water purification envisioned and put into place by R.C. Harris is a grand example of this period of civic governmentality. At that moment in the political and cultural narrative of modernity, the R.C. Harris plant on the shores of Lake Ontario represented a tremendous belief in the public good and the importance of investing in it. It was more than a filtration plant; it was a public display, a symbolic government promise to the citizens of early 20th century Toronto that clean drinking water would be provided for all. Through the process of pumping, filtering, purification and organized distribution, the Harris waterworks site was encoded with an intense faith in the future and the power of hydraulic technology to build a new society—a brighter more democratic one.

The driving issue for this "city of churches" in the early days of the 20th century was to secure a supply of fresh, potable water. Rapid growth and urban expansion had led to the drying up of wells and a terribly polluted harbour; decaying garbage, wash water, animal blood and excrement, human urine and feces all contributed to a serious water quality problem in Toronto. In 1882, the *Globe* went so far as to describe the city water

system's product as "drinkable sewage" (MacDougall 6). The same year, the *Canadian Lancet* reported that it was, "a sad fact that such a vast amount of filth has already been poured into what should be, but is not, a delightful basin of pure water" (2). Aquatic life and beaches ruined by raw sewage also hurt the economy and Toronto, like all cities in North America, it was eager to attract immigrants and business capital. The rank pollution of the harbour and crippling health epidemics together with the inadequacies of private water suppliers in the 19th century formed the historical impetus for the public utility model in Toronto. Historians Christopher Armstrong and H.V. Nelles observe that Toronto was ahead of other municipalities stating, "if the idea that utilities were public had a spiritual home in North America, that home would be Toronto" (192). Private water companies provoked public resentment through a combination of poor service and high rates (Middleton 46) and Toronto, despite its British Tory legacy proved "remarkably public minded" (Anderson 195) in practice. In the late 19th century Toronto had more "socialized services" than any other city of similar size in America—services described by local historian Jesse Edgar Middleton (1923) as having been "created and administered by the consent of an electorate which is enthusiastically, even ecstatically Conservative- or thinks it is" (46). In 1856-57 Toronto's city council debated "the classic issue of public versus private ownership" and came down in favour of a public water works (Jones & McCalla 310). The Toronto council also had the support of the press with the *Globe* (2 May 1857) reporting that:

> Bad as municipal corporations may be, there are some things which cannot well be done without them, and we think, the construction of water works is one of them. We would, however, give as little power to the Corporation as possible, and

> as much to the people; and we would have the public and the press, and everybody else, watch every movement of the water commissioners as cats watch mice.…(Jones & McCalla 311)

A new public utility, the Toronto Water Works Commission was finally created in 1872-77, assuming the assets of the existing private water franchise and heralding a fundamental change in the way government "viewed their responsibilities in matters of public health and safety" (Anderson 217). It was business more than ideology that prompted the public spirit of late 19th century Toronto, but it laid the foundation for R. C. Harris and the work of his ambitious Public Works department in the decades that followed.

Initially, water supply systems were built expressly for fire purposes. Towns with waterworks enjoyed a 20-50% reduction in the cost of fire insurance and this was especially pertinent for Toronto. The Great Fire of 1904 wiped out much of the downtown core and prompted civic action on the construction of a high-pressure water system for fire-fighting purposes (Riendeau 165). By the early 1900s there were over 232 miles of storm and sanitary sewers in place and Toronto's public works department had begun the process of installing private drains to connect with the main sewers (Riendeau 162). Once this project was accomplished there remained the problem of what to do with the collected effluent. Inspired by Edwin Chadwick's sanitation movement in England the generally accepted solution was to decant raw sewage straight into Lake Ontario (or the streams and creeks that fed into it) where it could be mixed with fresh water and "purified by natural chemical actions" (Baldwin 225). Based on this premise of "the self-

purifying capacity" (Goubert 46) inherent to all running bodies of water, currents were carefully charted and the effluent taken further out into the lake. Alternate water sources including the somewhat distant Lake Simcoe and Oak Ridge were also debated, but the esteemed English engineer James Manserge, who was brought as a consultant to Toronto in 1895, insisted that Lake Ontario was the natural supply source. On his recommendation the construction of a new steel intake pipe and the driving of a tunnel under the floor of Toronto Bay was completed in 1908 (Harris 720). By 1916 there were ten Ontario communities emptying raw effluent into Lake Ontario, Lake Eerie was already described as a 'sink of corruption', the Niagara River fouled, and the St. Lawrence River also badly polluted (Baldwin 236).

Paralleling the rising influence of the fire insurance industry in the late 19th century was an increasing demand from doctors, civil engineers and social reformers for pure water and proper sewage disposal. Rivers and streams such as Garrison Creek (so named because it entered Lake Ontario just east of the military garrison Fort York) had become open sewers, watery veins carrying an immense accumulation of human and animal waste downstream to the heart of Toronto's water source. Noxious sewer gas known as miasma arising from stagnant ditches, marshes, gutters, and overflowing cesspools had formerly been blamed as the source of virtually every communicable disease. But in a pivotal historical moment Dr. John Snow traced the cause of an 1854 cholera epidemic in Soho, England to a single polluted well, the now famous Broad St. pump. Thus by the beginning of the twentieth century the 'science of the invisible' was unfolding and it was clearly understood that the typhoid bacillus ('dirty hands disease') and cholera bacterium ('the blue death') both thrived in water (Goubert 45). Ironically

most waterborne diseases kill by dehydration as a result of intense diarrhea and or vomiting. Cholera is particularly cruel, leaving its victims blue (hence its common name), writhing and breathless within forty-eight hours of contact (Morris 14). In Toronto the debilitating typhoid fever epidemic of 1910 marked a turning point in the city's water treatment as chlorination was introduced at the Island Filtration Plant for the first time. With Lake Ontario as both the source for the city's drinking water and the site of its sewage disposal, treatment was crucial and Toronto engineers later pioneered such refinements as pre-chlorination, superchlorination, and de-chlorination (Benidickson 229). After 1918 all the water in the filtration system was treated and by the early 1920's the infant mortality rate in Toronto had dropped substantially, from 140 to 63.5 per thousand (Lorinc 21).

Roland Caldwell Harris became the Toronto Public Works Commissioner in 1912 at the age of 37, a position he held for 33 years until his death in 1945. Harris is described by Toronto Mayor H.C. Hocken in 1913 as "a man of aggressive, militant earnestness" (Market Gallery 6). A proud Anglican and a driven visionary with a keen interest in architecture, urban design and photography, he is credited with rebuilding the city's water supply, dramatically improving the city's public health standards and laying the groundwork for Toronto's ambitious outward expansion in the 1920's and 1930's (Lorinc 17). In his obituary the *Globe and Mail* (1945) stated simply: "Under his guidance most of the modern sewage and water works systems in Toronto were completed." Decades later urban affairs columnist Christopher Hume paid tribute to Harris in the *Toronto Star* by describing his approach to "the humble processes of water purification" as a devotion

that “bordered on the religious” (B01). It should be noted that Harris was an extraordinary leader with exceptional people behind him, including the renowned Dr. Charles Hastings, Medical Officer of Health (1910-1929). Hastings was a driven man who pushed hard to convince civic leaders of the value of clean water and effective sanitation measures to the point that, “when Hastings left the department, Toronto was recognized internationally as a leader in public health” (Riendeau 170). Also vital to Harris’s water enterprise were the collective talents of the young Scottish architect Thomas C. Pomphrey, engineers William Gore and William Storrie who were experts in the field of water supply and sewage treatment plants, their partner George Nasmith, an engineer and bacteriologist, and finally artist Arthur Goss, the official city photographer who took over 26,000 stunning pictures of Toronto Works projects.

R.C. Harris left his mark all over the city, from his first big project, the celebrated Bloor Street Viaduct to some 700 miles of new roads and sidewalks (Lorinc 17). He went to great lengths to establish a distinct ‘City Style’ in Toronto and his public works projects all tended to employ locally baked yellow brick and copper roofs, Queenston limestone and concrete copings adorned with ornaments and castings. Most pertinent to this study, however, is the urban network of water reservoirs, sewer trunks, and filtration plants he worked tirelessly to establish in the first half of the 20th century. Known as the Toronto Water Works Extension (TWWE) project, this dedication to public services culminated in the grandly ambitious Victoria Park Pumping Station designed by Thomas C. Pomphrey, the staff architect for engineering firm Gore, Nasmith & Storrie. As a new Public Works Commissioner, Harris found the water problem loomed large. The Toronto Island Filtration Plant (built in the 1890’s) was no longer sufficient, and an extension to

the waterworks was imperative. On December 23, 1913, Harris presented to city council his Victoria Park plan as part of his larger scheme for solving Toronto's water crisis entitled "A Report of the Commissioner of Works on Additions and Extensions to the Toronto Waterworks Pumping and Distributing Plant". Approved construction was delayed by twenty years (the mid-town St. Clair Reservoir was erected in the meantime) but in 1923 council finally expropriated Victoria Park for $370,000. Ten years later in the summer of 1932 with the enormous budget of $25 million, construction began on the "palace of water". As his landmark project commenced Harris also oversaw the construction of a new sewage treatment plant in North Toronto. The monumental Victoria Park Pumping Station and its sleek West wing were finally completed in 1935 with the symmetrical East wing of the filter building added in 1956 to meet the city's increased demand.

Located in the East end of Toronto and originally well beyond the city's formal limits, Victoria Park once boasted an amusement area and later became the site of a municipally run 'Forest School' for unhealthy children. A graceful array of coordinated buildings set on a bluff, the very public waterworks at the bottom of Victoria Park Avenue (where Harris himself owned a home) offers up a panoramic view of Lake Ontario, tiered manicured slopes and a promenade along the imposing sea wall. Today we look back upon a great era of municipal public utilities, and the R.C. Harris Filtration Plant is an architectural work which "sums up for us the patriotic, heroic aspirations of R.C. Harris and public servants like him" (Bentley Mays 268). It represents one of the last great examples of Beaux-Arts planning in Metro Toronto. Declared a National Historic Civil

Engineering Site in 1998, this neo-Byzantine structure was immortalized along with its creator ten years earlier by Michael Ondaatje in his novel *In the Skin of a Lion:*

> From across the province the subcontractors brought in their products and talent to build a palace for water...Harris has dreamed the marble walls, the copper-banded roofs. He pulled down Victoria Park Forest and the essential temple swept up in its place.…(109)

No forest was in fact torn down, for Victoria Park in 1913 was already a rolling expanse of wild grass land, but the Forest School was forced to relocate to the western end of the property when construction commenced in 1932. Clad in limestone, yellow-bricked and roofed in copper, this tiered Art Deco site is "our Greta Garbo of public architecture, and among Toronto's grandiose expressions of building in the Depression Modern style" (Bentley Mays 266). Architect Steven Mannell notes that Pomphrey's design follows a "cross-axial plan, familiar from churches, that monumentalized all parts of the works" (*HTO* 105). The structure's classical formality is embellished with bas-relief patterns depicting turbines and waterfalls and spectacular green and beige marble interiors are lit with sky-lights and ornate brass fixtures. Its entrance is modeled on a Byzantine city gate, the tower is subtly Egyptian (a popular motif in Toronto at the time); it is a monument which "fairly oozes atmosphere" (Ledger 6).

Harris obsessed over every minute detail of his glorious filtration plant to create a "shrine to progress in all its fetishistic beauty" (Kaika 38), a water showcase in a park-like setting that was open to all. From the beginning, the Victoria Park plant was designed to accommodate public tours and oversized controls and monitors reminded plant workers themselves of the very public nature of their work. Behind glass walls the

chlorinators were highly visible symbols of Toronto's proud contribution to the water-supply process (Mannell *HTO* 106) and tours of the pump house and filtration galleries ran regularly up until 9/11 2001. Architecturally the Filtration Plant is a prime example of Art Deco style integrating Late Romanesque Revival and Modern Classical forms; according to architect critic John Bentley Mays the use of streamlined Classicism for reviving patriotism and public spirit was pervasive in Depression-era Canada (Bentley Mays 268). Toronto had been crushed by the Depression and the grandeur of the Victoria Park Pumping Station was meant to restore to "a defeated citizenry the reasonable hope for a decent life"(Bentley Mays 268). Many key publicity photos of the waterworks were taken offshore on Lake Ontario to bolster the "conscious urban mythmaking" (Mannell *HTO* 108) that was integral to the project.

The use of rich material such as marble and bronze in the interior was characteristic of Art Deco filtration plants across North America but was unusual for Toronto's generally rather utilitarian structures. Even more unusual was the fact that the decorative program at the R.C. Harris site surpassed that of most other water facilities, not only in the filter-operating gallery and the adjoining spaces of the Administration Building, but also throughout the interiors of the Pumping Station itself (Reeves 2). Harris incorporated massive floor to ceiling windows designed to look out over "filter pools four feet deep, languid, reflective as medieval water gardens" (Ondaatje 110), herringbone tiles were ordered from Italy, art deco clocks and ornamental iron were judiciously chosen, brass elevators and elegant pump signals carefully installed. Every inch of this monument to water purification was designed with a public audience in mind.

Social and cultural realities in 1930's Toronto were grim. The problems pertaining to overflowing outhouses, rank open sewers, muddy roads and toxic water were indeed pressing, but against the backdrop of the Great War (1914-1918) and the Depression era that followed, the opulence and grandness of the waterworks was highly contested in the press. Completed not long after the stock market collapsed, the costs associated with the Filtration plant were the source of controversy in Toronto right up until it opened in 1941, and to this day expenses around its upkeep garner criticism. (City Hall has spent $8-million to date on a long-term restoration plan with another $15-million to come over the next five years (Shufelt M3) and critics have been vocal). When the palace of purification finally did begin operations the world was once more at war and the city was struggling with both unemployment and the accompanying burden of heavy public debt. Wartime sacrifices were a measure of both personal service and civic duty and Harris's monumental municipal project was at odds with this sentiment. Against a cultural backdrop of sacrifice and deprivation, all that "marble and terrazzo was an embarrassment" (Shufelt, M3) and as such was greatly ridiculed by the mainstream press. Headlines such as, "Looking over Victoria Park Pumping Station - I Dreamt I Dwelt in Marble Halls" (*Toronto Telegram* 1938) were typical. In July of 1938 the *Globe & Mail* reported, "the visitor will undoubtedly gasp with astonishment at the luxury of the furnishings" and further that once inside the main pumping room said visitor would see, "a sight that makes the state banquet hall in the Palace of Versailles look almost like a tenement house attic" (Tilley 1). Critics mocked the absurdity of marble walls, tiles imported especially from Sienna and costly bronze staircases constructed deep into the underground tunnels beneath the lake. Officials countered this last charge with the

reasoned claim that bronze had to be used despite the expense because the metal must not corrode and "endanger the purity of the city's future water supply" (Tilley 1). Alderman William Croft's comments made extended headlines in the *Toronto Evening Telegram*, July 29 1938: "Marble halls, terrazzo floors, plate glass windows, $20,000 fences, bronze railings on the stairways and tile trimming are beyond all reason" (*Toronto Telegram*, 1938). Mayor Ralph C. Day even opposed the $20,000 fence on the sea wall but in the end was overruled by the board of controllers who supported Harris and his water palace in the park. The lavish materials of the Harris Waterworks were also contrasted with the enormous cost to the taxpayer, the working conditions and lives lost during construction due to cave-ins and other accidents: "For the past eight years hundreds of men have been digging. Four lives have already been lost, and nearly $15,000,000 spent in the construction of Toronto's palatial new Victoria Park waterworks system" (Tilley 1). Ondaatje depicts the gruelling eight-hour shifts endured by workers in the tunnel under the lake who "slip in the wet clay unable to stand properly, pissing where they work, eating where someone else left shit" (Ondaatje 106). Mules and pit-horses were transported down into the heat and the darkness to work with the men burrowing in harsh conditions for years beneath the surface of Lake Ontario.

This running commentary in the public sphere was not all negative; the glamour and bright promise of progress was not lost in the telling. Writing for the Centennial Committee of Toronto in 1934, historian J. E. Middleton, for example, wrote with enthusiasm about the new extension: "It includes a rock tunnel two miles out into the Lake, off the shore of Victoria Park, a great filtration plant in the Park, a supply tunnel seventy feet below street level across the ten-mile front of the city, and reservoirs of

mighty size" (1934: 44). Norman J. Howard (President of the American Water Works Association and Director of Water Purification in Toronto) reviewed the developments and trends of 1940 in water supply and purification and proclaimed the interior design and architectural features of the Harris site worthy of its description "as amongst the most modern and beautiful plants in America" (Howard 3). A highly optimistic sub-headline in the *Evening Telegram* the summer of 1938 declares, "New Fifteen Million Dollar Project Will Make Water Shortage in Future Impossible." The *Toronto Star* (July 26 1938) made similar claims: "Luxuriously equipped, the plant will be a showplace when thrown open to the public: It will remove all possibility of a water shortage." Not even a hundred years later this statement is achingly naive.

Water first flowed into the pumps November 1, 1941; an official opening delayed by the war. The great project Harris spent his career promoting was finally realized and perhaps, as Bauman posits, this truly is the definition of modernity, "having a project means that you make things different from what they are at the moment, you change them" (2). The 1900s saw "the beginning of water's *belle epoque*" for it was now possible to analyze water effectively, to supply and deliver it to an ever expanding urban citizenry in conditions of safety and convenience that continued to improve (Goubert 44). In his novel Ondaajte describes R.C. Harris as a man "who understood the continuity of the city, the daily consumptions of water, the speed of raw water through a filter bed, the journeys of chlorine and sulphur dioxide" (110). This understanding of the city and the circulation of water intersected with a particular moment in modernity that made possible the epic visions Harris fought to realize. For it was implicitly heroic this measuring and

analysis of water, the channeling, pumping and organized distribution of it all; embodying a modernist industrial theme of imposing human will and governmentality towards the conquest of nature through technology (Wilk 308). On a once remote bluff at the eastern end of Queen St. the so-called palace of purification is still functioning though now fully automated. It pumps out two hundred million gallons of lake water daily through two intake pipes below the lake bed that stretch almost three kilometres from shore. The processes of pumping, filtration and chlorination reconstitute raw water from the lake into a potable commodity, a modern hybrid: "neither purely natural nor purely a human product" (Kaika 53), before distributing it through buried channels to countless sites of consumption. At 200 mgd (million Imperial gallons per day), the Harris waterworks is no dead monument; it is still the biggest plant in Ontario (as well as being one of the largest in North America), providing Toronto with forty-seven percent of its potable water.

The Harris plant is emblematic of the 20th century theory and practice of public health born from the understandings of the bacterial causes of waterborne diseases in the late 1800s. The sanitation revolution of the 19th century was displaced in the wake of the cholera and typhoid epidemics and the democratization of water began. Visible networks piped water and sewage; pump houses and filtration plants were grand monuments embedded with modernity's promise of a better life, a more equitable society and the ideology of emancipation through progress. In an era of acute urban growth and scientific discovery the monumental form was built "to pay homage to the constructions that would transform people's lives" (Kaika 39). As the Italian futurists in the years before WWI proclaimed, "the triumphant progress of science makes changes in humanity inevitable"

changes the people were confident would in turn have the "free moderns" basking in "the radiant splendor of our future" (Berman 25). The Harris waterworks is part of Toronto's "urban dowry" (Kaika 38) of visible networks of technology. Networks, Kaika argues, were fetishized as the material expressions of the ideology of progress. Pumping stations, dams, and water towers all held a fascination through their ornamental display and the "promise they were carrying" for a brighter more equitable future (Kaika 38-9). The majority of large dams were constructed between the 1950s and the 1980s; the 1970s in particular saw many pilgrimages to these technical feats of hydraulic engineering. During the late 19th and early 20th centuries there were even boat trips through the sewerage system of Paris that were organized for the middle class. For those located outside of the urban area, guided tours and spectacles were set up to enable them to come and marvel at these embodiments of technological innovation.

We no longer pay this kind of homage to our water supply. There are only 15 water towers remaining in Toronto though these visual emblems marked much of the skyline until the 1970s. When the locally built Lorne Park Water Plant was awarded the Architecture Award of Excellence in 1975 for its inconspicuous underground design, the editor of *Water and Pollution Control* wrote about the ideal of a water plant being a "totally unobstructive 'non-building'"(Webster 34) as based upon the premise that: "community services, water treatment or pollution control were something we were somehow ashamed of: something to be buried out of sight, underground" (Webster 34). Webster laments that the architects and urban planners involved did not take the opportunity to "acknowledge the key role played by water supply and pollution

control in community life by integrating the process, the plant, and the community a little more, and providing for some degree of understanding" (34). Despite their importance for the function of the contemporary city, technology networks are today largely hidden, or have disappeared underground, rendered invisible by being "locked into pipes, cables, conduits, tubes, passages, and electronic waves" (Kaika 28). This cultural shift from a public celebration of material structures imbued with "the triumphant progress of science" to their subsequent burial during high-modernity suggests that this ideology no longer inspires. Filtered H_2O is a currently a resource which bears no reference to its production process. It has become truly invisible, "an apparent triviality, located simply at the mouth of the tap" (Kaika 45). This lack of meaning or consequence is highly pronounced in an aqua rich nation like Canada, a country the Organization for Economic Co-Operation and Development (OECD) cites as "one of the world's most profligate wasters of water" (Maich 27). In Toronto, local water memories have been buried beneath us or lost to the myth of abundance and the fantasy of unending supply despite or perhaps because the city is situated on the shores of a Great Lake. Our lack of connection with the lake is entrenched both physically and culturally through the historic monopoly of the railways and poor urban planning. Public works projects like the R. C. Harris Plant no longer proudly feature tours or promenades and memories of cholera and typhoid have all but been erased.

Brita Riley and Rebecca Bray, *drinkpeedrinkpeedrinkpee* 2008.

CHAPTER FOUR
The Political Economy of water

Invisibility is indeed the height of conquest.
Jean Pierre Goubert, *The Conquest of Water* (1989)

History is just a long story about a fight with water, you know? You have too little and you can't eat so you bend a river, or you have too much so you bury one to build houses, and then there's too many people and too much competition, so you cross some water to get more resources or find more places to put people and when you get there you don't like where the ponds and ravines are, and so on and blah, blah, blah.
Michael Redhill, *Consolation* (2006)

A project entitled *drinkpeedrinkpeedrinkpee* ran in March and April of 2008 as part of Eyebeam Gallery's Feedback exhibition in New York City. The installation invited visitors to perch on a toilet while directly facing a drinking fountain providing the visceral sensation of taking in water while peeing it out. Tubing from the toilet diverted urine in two directions highlighting the "invisible water and life cycles we often unwittingly take part in" (brittaandrebecca.org). One path sent urine directly into a nearby aquarium "causing toxic conditions" that paralleled those created in waterways when urine passes through our current sanitation infrastructure. The other tubing path (covered in scribbled notes) channeled urine through a handmade treatment process that extracted nutrients and liquids "for use in a healthy aquarium and water fountain" (brittaandrebecca.org). Created by artists Britta Riley and Rebecca Bray of submersible design, *drinkpeedrinkpeedrinkpee* sought to probe the boundaries between the community and the individual as well as the role our bodies play in larger ecosystems. The piece asks the viewer to consider the journey water takes through our internal organs before moving beyond our body to the sewage system and out into the open waterways we swim in and drink from. Further to this, it asks what and how sentient ecosystems might use our personal waste once it disappears down a drain into a "new lifecycle

economy". Riley and Bray's *drinkpeedrinkpeedrinkpee* metaphorically highlights the fact that water is always circulating, moving through and around us unless there is some form of human intervention. Rivers, streams and lakes are the veins and arteries that link us to the ocean. Put another way, all drains ultimately lead to fish habitat and our personal "water address" flows back to ever-larger bodies of water that in turn connect us globally with other communities (*Stream of Dreams*). The central idea underlying this chapter is the cyclical journey water makes both literally and metaphorically as its pumped from sites of production, through an assortment of filtrating apparatus and out to sites of consumption (and back again) as an engineered hybrid. In the 21st century the shift of this flow resource to a "matter of concern" and the accompanying political "entanglements" around the reality of a freshwater crisis are increasingly complex, particularly as potable water becomes scarce. In light of impending scarcity these "entanglements" promise over time to give way to illuminate new forms of water literacy and policy as the century unfolds.

The legacy of waste disposal has greatly shaped and informed our current water culture and practice. Domestic water supply in the industrialized world is used for drinking, washing and the disposing of human sewage, connecting water and sanitation as "two sides of one coin" (Black 36) in a costly cycle. In 1895 Brouardel and Thoinot observed the dangers inherent in this relationship, noting that it was quite normal to "see cesspits and wells side by side, forming, as we have said, the two barrels of a gun" (Goubert 50). Historically waterways have long been used as open sewers and drains with little regard for how that might play out in the encompassing ecosystem. Large cities such as Toronto

buried their fouled creeks underground in the early 20th century; freshwater streams and rivers were sacrificed to the industrial revolution and development has trumped environment ever since in a culture of flushing and forgetting. According to Canadian Maude Barlow, in the global South alone ninety percent of the wastewater currently produced is discharged, untreated, into local rivers, streams, and coastal waters (*Our Water Commons* 14). Even the much-celebrated aqueducts of ancient Rome, built to bring clean water from the Apennine Mountains to their settlements, are simultaneously symbols of Roman society's sophisticated water management and representative of environmental mismanagement. The city was built on the Tiber River and waste was dumped directly into the river until it became undrinkable. Fresh water had to then be brought in from great distances, and though it was transported with tremendous ingenuity, it is worthwhile to contrast this water-based system with the long history of waste management in Edo, Japan the city modern Tokyo is built on. In Japan (and China) "night soil" has been scrupulously collected for centuries to fertilize agricultural fields. Due to this practice Edo had numerous clean water outlets available and a much more egalitarian water supply than Rome did (Black 6). The irony is that under China's current economic mandate great swathes of this farmland are rapidly being turned into industrial and residential zones, yet almost half of China's municipalities and most rural areas have no systems in place for treating the resulting waste at all (Mann 126). Consequently rivers such as the Lui are "black as soy sauce" (Mann 136), and of China's 30,000 miles of major rivers "80 percent of them are so degraded they no longer support aquatic life" (Barlow *Our Water Commons* 14). Of course as industrial production in the West increasingly relocates to China (in part because of their lax environmental standards) the

degradation of their rivers and streams rests on all our shoulders. As Dr. Dale Wen of the International Forum on Globalization says, we cannot condemn China's pollution problem without "condemning the foreign transnationals for so much of the damage on Chinese soil" (Barlow, *Blue Covenant* 160). It is our collective mutual waste that is dumped in their waterways, an international toxic cocktail which flows slowly back to the sea we share.

Ultimately, Sir Edwin Chadwick and the Sanitarians of 19th century London made the decision to wash human waste into the London sewers, and cities like Toronto have adapted this framework ever since. During the late 1800s there was some minor debate on the issue and in 1886 even Toronto's medical officer extolled the benefits of night soil collection:

> Even a new country cannot afford to throw away material so necessary to maintain the soil for vegetable products. Beside [sic] there are within a short distance of Toronto waste lands which could, by the aid of this very substance, be made fertile fields. (Baldwin 227)

However despite these arguments, Toronto at the turn of the century was decidedly in favour of a water-carriage system as the best means to do away with their waste:

> The dry earth system, with daily removal by cartage, is safe, gives perfect freedom from sewer gases, and is successfully carried out in some larger cities; but as Toronto is virtually committed to the water-carriage system, that system need not now be discussed. (*The Canada Lancet* 15.1 1882)

The dry-earth closet (essentially a composting toilet), night soil trade and the vast sewage farms of the late 19th century proved to be no match in the end for the convenience of

flushing (Benidickson 126). Yet waterborne sewage is extremely water inefficient; Maggie Black argues that, "if the sanitary engineers were to start again from scratch today, the use of precious water as a human waste transport would probably be outlawed" (41). The Harris Filtration Plant on the shores of Lake Ontario then, is not only an elegant monument to filtration, but to the water carriage system and the process of flushing. The *drinkpeedrinkpeedrinkpee* project points out that nutrients in human urine are too potent for our waterways, yet it is possible to simply separate out the nitrogen and phosphorous from urine (a DIY kit is showcased in the exhibit) for productive use as soil enrichers. In our current sanitation process pathogens from feces must be removed from all wastewater before its sent back to the lake. Alternatively, an 'ecological sanitation' system would use urine-diverting toilets to ensure that pathogens from human feces were not flushed into our waterways and the nutrients in our excreta (nitrogen, potassium and phosphates) were recycled into the earth as fertilizer. In a market-based economy that devours water, water-borne sanitation has perhaps become an unsustainable extravagance in need of cultural reexamination as a "thing" to become a "matter of concern" (Latour 41) in recognition of the fact that it can no longer stand as a viable model for the future.

The journey from raw lake water to filtered, chlorinated, fluoride-filled life-giving tap water is a small modern miracle executed daily, presented without fanfare for our consumption. Water now permeates the rites of cleanliness and hygiene (Goubert 25), flowing through the grid of pipes and sewers of the city to service daily tasks. Formerly the gathering of water, or the quest for water as cultural historian Jean-Pierre Goubert terms it, was heavy difficult work. Its physicality is fluid and to divert it is much easier

than to carry it. In some countries like France, water carriers sold it to those who could afford the service. It was a tedious occupation and by the end of the eighteenth century water carriers were considered to be the "dregs of the working classes", a band of "vile men and raucous women" who upset the inhabitants of the districts in which fountains were situated (Goubert 22). More commonly it is a task that has traditionally fallen on the shoulders of women and children particularly in the global South (www.watercan.com). According to the Women's Environment and Development Organization (WEDO), in contemporary societies women are still the primary collectors of water responsible for about 80 percent of water-related work throughout the world (Barlow *Blue Covenant* 161).

In industrializing countries, the political cultural move towards the conquest of water began in earnest in the nineteenth century and continued right up until World War II, replacing the drudgery of the quest and the arduous task of hauling it back. Large water institutions took shape as water was "besieged by science and technology" (Goubert 25) in a process that turned this resource into an industrial and commercial product carefully "monitored, distributed and drained away" (Goubert 255). The new hydraulic technology required vast capital investment in machinery, filters, reservoirs, and pipelines from the public purse and the citizenry had to be convinced. Universal access with all its implied benefits and the narrative of progress helped push the grand project forward. Physical manifestations of this ideology changed the landscape profoundly, altering it both below and above ground as sewers, water towers, filtration plants and massive dams were erected. The new technology was masculine, what cultural theorist Zoe Sofoulis terms "Big water"; was a sociotechnical system where the

responsibility for municipal water supply was placed solidly in the hands of scientists and the men who ran public works departments. City builders like R.C. Harris were quintessential modern heroes with ambitious designs for engineering projects on a lofty scale; their dams, pipelines and central sewage treatment plants all feature largely in Big Water's history and are confluent with the Big Projects of nation building (Sofoulis 452).

The nineteenth century also saw great strides in public health and sanitation alongside the rise of a new brand of heroes – the public health engineers. Microbiology altered cultural perceptions of water with the new knowledge of impurities present but unseen. The relationship between sanitation, hygiene and health revealed greater understandings of how disease was spread, and a "cult of cleanliness" (Goubert 25) took hold. This abundance of water flowing through pipelines brought about a cultural shift. It was a shift that carried with it an altered cultural code, which as Goubert so beautifully puts it "normalized the over washed". New rites of cleanliness made ancient patterns and healing rituals associated with water appear out of step with the emerging faith in science and progress: "Dreams of tapping naturally pure sources of drinking water increasingly gave way to the chemical engineering of water in stunning palaces of purification" (McMahon Pipe Dreams). The use of water became secularized as it fell under the auspices of the hydraulic engineers and slackened the link that water provided between body and nature (Goubert 257). By the 1930s corporate slogans such as Dupont's "Better things for a Better living...through chemistry" (sometimes abridged to "Better living through chemistry") which they launched in 1935 summed up a prevailing belief in the optimistic narrative of science and progress.

Ultimately, the problem in the contemporary world lies in the fact that there are few places left where naturally occurring water is safe to drink. To create 'safe' water (a hybrid) it must be engineered and the engineering of water requires a deep economic investment. In Toronto this process begins in the pump house drawing two hundred million gallons of "raw" water daily from the lake to be screened, filtered, and disinfected. Once it has been chlorinated and fluoride enriched it must be processed with ammonia to keep the chlorine dissolved, and finally sent to taste-and-odour control for the addition of various minerals (www.automationmag.com) before it is finally deemed a 'safe' drinkable commodity. All this engineering is essential for our water supply is not only polluted, it is finite. We essentially have as much water now on the planet as we did in the Jurassic period. Perhaps we have even less, for recent research by Slovakian hydrologist, Michal Kravcik (Goldman Environmental Prize Winner, 1999) shows there to be a decrease for the first time in the hydrological cycle due mainly to the abundance of non-permeable surfaces and the consumption of groundwater at an unsustainable rate. Groundwater depletion in particular is an "entanglement" of grave concern, for if water table levels drop too low seawater can invade aquifers. Salt contamination then limits the usefulness of this water for drinking or irrigation. Aquifer salination is already a problem in Florida, parts of India, the Gaza strip, and the Nile River Delta. If one were to map the globe as a water atlas and compare the earth's visible surface freshwater (in lakes, ponds, and rivers) with the amount of water stored in underground aquifers it would be clear that the region unseen is sixty times as large (Leslie 39). Due to the vast size of groundwater aquifers it is impossible to tell if the fresh water in these ancient holding cells has been contaminated until it's too late. What is clear is that we consume and pollute this resource

at an unsustainable rate. Our reliance on groundwater in agriculture causes food to be grossly undervalued and regulations for responsible groundwater use have yet to be established. Rapid industrialization has intensified water scarcity which will in turn begin to effect what we eat and what crops we grow as the need to get "more crop per drop" (Leslie 5) escalates. Sandra Postel states ominously that the "overriding lesson from history is that most irrigation-based civilizations fail" (12). China, India, Pakistan, Mexico, and nearly every country of the Middle East and North Africa have all been depleting their groundwater resources to the extent that salinity has currently affected a fifth of the world's agricultural land (Leslie 42). Running a groundwater deficit is a phenomenon of the late 20th century and the result of its continuing mismanagement could be catastrophic for the planet as a whole in the 21st century (IWMI International Water Management Institute).

The conquest of water continues in the form of massive transformations of waterscapes to serve a political mandate as much as an economic one (Biro 324). For many, "Big Water" and the lineage of nation-building projects lives on in the form of desalination plants, giant pipelines, and bulk water transfers. A future as grand as its past is envisaged through vast hydraulic schemes aimed at solving the looming water crisis. China's Three Gorges Dam on the Yangtze River is such a project, reigning as the world's largest and most expensive to date. All dams in Turkey and Syria are enormous, contentious sites of political strife and water diversion, but it is the American west that represents a truly modern hydraulic landscape. Throughout the 20th century the United States federal government alongside private investors worked to transform the California desert into a fertile plain by means of massive interventions. Between 1935 and 1993

almost every mile of the Colorado River was modified in some way through a series of dams, reservoirs, canals and aqueducts (Sheppard and White, 283). Out of this heroic project arose the Hoover Dam (1935) bordering Nevada and Arizona—America's great pyramid standing 85 meters higher than anything built previously. The resulting Lake Mead is the largest human-made lake in North America. Like the Harris plant it is a highly decorative, public monument featuring "suave Art Deco railings, fluted brass fixtures", and "three miles of polished terrazzo granite walkways" (Leslie 41) and is still viable today, providing 85 percent of Las Vegas's water supply. Las Vegas itself is a fantasy city, a desert construct that essentially the Hoover Dam made possible; it stands as a symbol of the great modern narrative, the "perfect manifestation of the notion that water will never run out" (Leslie 51) and the legacy of "Big Water" at play.

All these acts of human intervention on a large scale are about the power to dominate the distribution of water. Contemporary mass diffusion of water has led us to a place where, Goubert argues, water finally has conquered us, "by transforming the world and becoming part of our daily life" (25). Public utility models of network water supply like the Harris Plant were in many ways a response to nineteenth-century experiences with the private provision of water supply. Small private corporations built and operated the first supply networks for the wealthy areas while the poor relied on public wells, civic taps, streams and rivers. Waterborne epidemics were devastating. These outbreaks combined with an inability or lack of interest on the part of corporations brought governments into the "business of water supply infrastructure" (Bakker *Eau Canada* 186). The basic practical aim was universal access to clean water and the protection of public health. But being hooked up to civic infrastructure meant much more than that, it

symbolized a share in a better world and a connection to a brighter democracy. As a shrine to citizenship and the public good, the Harris plant physically manifests this late 19th century idea that not only did all members of society have the right to clean water, but that this right was linked to a participation in civic life.

The pursuit of potable water is no longer merely a narrative about feats of scientific and technological prowess, but rather an opening towards new and varied cultural equations to deal with a burgeoning fresh water crisis. As Sunita Narain, Director of the Centre for Science and Environment in New Delhi claims, "Water shortage is not about mere failure of rain. It is about the failure of society to live and share its water endowment" (Black 5). Failed historical memory and cultural attitudes may be the largest impediments to resolving our impending water crisis rather than our limited supply (Reuss vii). It is not at this point a question simply of scientific know how, but one of management and execution. Monuments such as the Harris plant ensured the visibility of water in the early 20th century. As the century progressed networks began to be buried underground and the water towers that dotted the skyline were demolished. It has become unusual to come across a public drinking fountain situated on a busy urban street corner and all these visual links to civic water supply and delivery are a notable absence. We have moved to an invisibility at the mouth of the tap a hundred years later and the conquest of water is indeed complete.

Part of the invisibility beyond the tap are the miles of hidden pipeline in a state of ill repair, for the "unseen vasculature of the modern city" (Morris 282) is a corroded underground distribution system layered with rust and slime, the "biofilm" (Morris) of its

hidden history. Regulations regarding drinking water quality end at the boundaries of the treatment plant and in North America the first iron pipes installed in the 19th century have now reached or exceeded their design life of 125 years. Lead pipes are still in place in many parts of the city of Toronto and consequently our drinking water is riddled with it. Toronto public health has begun to provide take-home kits for lead testing and analysis, and bottled water consumption is increasing here, as it is worldwide. In 2007 over 200 billion litres of bottled water were consumed globally (Barlow *Our Water Commons* 8). Networks of aging pipelines once a matter of fact, now constitute a large part of infrastructure maintenance and are a major area of concern. Full of invisible decay and expensive to replace they are the weakest points in the public water supply system. It is this costly, aging infrastructure which opens a porthole for corporate occupation.

Against a backdrop of invasive corporate culture with a focus on market efficiency, the 21st century is in need of an invigorated water literacy and a re-examination of our current socio-cultural norms, which is a large part of *drinkpeedrinkpees*' aim. Going back to Latour's *Dingpolitik* and the idea that objects become things, the giving way inherent in this process also presents an opening for new players and assemblies to engage in public debate. As Latour posits, each issue will illicit "a different pattern of emotions and disruptions, of disagreements and agreements" and each object "gathers around itself a different assembly of relevant parties" (15). A kind of water apartheid has begun to take hold as our watersheds start to become a matter of concern. Difficult questions arise concerning who has political and economic agency over this primary resource, both locally and on a global level. Given the importance of this life-giving molecular chain it is important to look closely at specifically who is assembling and why, who is

disassembling and what do they want? Activist organizations such as Food and Water Watch, Sweetwater Alliance, the Council of Canadians and International Rivers, for example, all believe passionately that water sovereignty must be maintained at the level of municipal government. Opposing this tradition, the members of the corporate-based World Water Council, who "have set themselves up as the arbiters of this resource" (Barlow 14), are lobbying hard for capital's involvement in fresh water distribution and sanitation services. To counter this a grassroots, democratic justice movement has emerged which works to "bring accountability, transparency and public oversight" to the issue, drawing large numbers across the globe. The international, non-profit organization Water Aid in the UK and the London based International Institute for Environment and Development (IIED) both try to merge thinking across the private and public sectors in order to foster dialogue and negotiate common ground.

Water flows continuously through the hydrological cycle, making the establishment of agency and property rights extremely difficult. Through evaporation and precipitation water circulates across oceans, in rivers, lakes, streams and groundwater centuries old. Its constant movement makes it subject to 'market failures' (Bakker 187) which occur when a market fails to meet the assumptions of standard neoclassical economic models and as in the case of water, when property rights are not clearly defined or enforceable. The engineered journey water makes as it cycles from sites of production to sites of consumption is a costly one and someone must pay for it. As a result the fierce debate over the allocation and management of fresh water is at once both personal and political. It is a debate that conjures up polarized points of view pitting notions of an idealized commons against stark images of corporate greed. It has also prompted a

renewed awareness and visibility to water as a resource—a resource that is not universally abundant. In the next chapter I will examine this sovereignty issue further by considering the intersection of water, commodity culture and neoliberal policies.

Carole Conde and Karl Beveridge*, The Fall of Water* 2007.

CHAPTER FIVE

Negotiating Water Rights: Commodity culture, the Commons and Neoliberal policy

Everyone knows the world's water is polluted. We more or less have given up doing anything about it. Instead of attempting to put a stop to pollution through governmental regulation, we will just switch to bottled water. We look forward to a future in which the commodity most necessary to sustaining life ends up in the hands of private corporations.
James Ridgeway, *It's All for Sale: The Control of Global Resources* (2004)

If a form of economy spreads that can escape any sort of accountability by flight forward into globalization, then society must intervene to restore welfare and social provision via the State. Irresponsibility is the organizing principle of the neoliberal vision.
Gunter Grass, *The Progressive Restoration: A Franco-German Dialogue* (2002)

The advanced capitalism of the 21st century is a bloated, vapid one with tentacles stealing across ever more porous national borders. In the global North our sociality is thick with corporate speech, we are a pleasure-seeking society drenched in a culture of commodities. The so-called information age we live in is a "postcommunist era of market triumphalism" in which "an imperialism of economy dominates our thinking" (Elyacher 497). Neoliberalism sits squarely on the agenda of the three public international institutions that anchor the production, finance and trade of global economic activity: the World Bank, the IMF (International Monetary Fund) and the WTO (World Trade Organization). The process of globalization which began with sixteenth-century European exploration and conquest is described by political anthropologist Julia Elyachar as a term that became the "catchword of a highly successful neoliberal agenda that asserted the inevitable refiguring of state regulatory regimes to increase the profitability of global financial capital" (493). It is an economic process that "has accelerated the transformation of everything into resource" (Yudice 28). Perhaps the most controversial resource of all is water and the services associated with it. Water is the matrix of life on

earth; a molecule of one oxygen and two hydrogen atoms, it is a fundamental part of our physiological makeup, a substance "that carries common humanity" (Strang 62) linking us to each other and to the material environment. Yet this 'essence' of social connection (Strang 72) is also a diminishing resource and a highly contested commodity in a world where large sections of the world's population do not have access to fresh water.

New forms of property are often created when goods become scarce. According to classical and neoclassical economic theory, property encourages good management (the 'internalizing' role of property) and makes trade possible (the 'identifying' role of property) as it identifies the person in control of any given thing (Rose 276). Fresh water is certainly scarce in many parts of the globe, including large areas of the United States. In five of the world's "hot spots" of water dispute—the Aral Sea region, the Ganges, the Jordan, the Nile and the Tigris-Euphrates basins, populations were projected to climb by 45 and 75 percent by 2005 (Barlow and Clarke 6), escalating tensions further. Consequently, water has become big business in the 21st century. Private operators now deliver water to approximately 15% of the world's population (Barlow *Water Commons* 8) and in 2009 Suez Environment alone provided drinking water to 68 million people and sanitation services to 44 million worldwide (www.suez-environnement.com). In an oft cited article published in *Fortune* magazine, Shawn Tully claims that water is "one of the world's great business opportunities" and further that it, "promises to be to the 21st century what oil was to the 20th century: the precious commodity that determines the wealth of nations" (55). Whether or not this proves to be true there exist ten major private companies currently vying for control of the world's fresh watersheds and the growth rate of the top two, Suez and Veolia (formerly Vivendi) of France is exponential.

Canada is home to about 20 percent of the world's fresh water (however, this is deceptive since we hold only 6.5 percent of renewable water resources). We enjoy near universal access to water and as a nation are one of the world's largest per capita users. Yet we represent just 0.5 per cent of the world's population. If water is the precious commodity of the 21st century, "then Canada through a miraculous stroke of lucky geography, is sitting on a liquid gold mine" (Maich 28). On the other hand, a hostile "aqua nationalism clothed in environmental righteousness" (Wood 44) runs through the nation, making Canada an inhospitable marketplace for the big water corporations. Gerard Payen, then senior executive vice president of Suez (France) remarked in 2002 that, "Canada is a very strange country, There are many people very vocal against private water companies; they do not know how it could work" (Carty 2). Yet "aqua nationalism" is not unique to Canada. Water is the consummate transnational flow, coursing its way over the geopolitical terrain evoking images of mythical proportion. Interactions with water within any given geo-cultural landscape are layered, as Strang notes, with "specific social, spatial, economic and political arrangements, cosmological beliefs and religious beliefs, knowledges and material culture, as well as ecological constraints and opportunities"(5). The cultural meanings and values encoded in water shift continually as it moves across borders through ancient riverbeds, lakes and the vast realm of the sea. It is inherently a messy, uncontainable commodity not easily configured to the marketplace and a purely economic mandate.

Social critic James Ridgeway posits that commodities have always been at the heart of things. The earliest known trade routes across the world, such as the Silk Road from Japan to the Mediterranean and the route to trade pepper, "brought distant and disparate

cultures into contact" and all were created in order to obtain and transport new commodities (ix). Commodities have played an important role in the rise of colonialism and empire, wars and the flow of migration and emigration. The sugar crop formed the industrial base for slavery, turning human beings into commodities in the New World. Today we see the linkage of commodities to national security, manifested clearly in the case of oil and US foreign policy. (Linda McQuaig traces these linkages extensively in her book *It's the Crude Dude: War, Big Oil and the Fight for the Planet*.) The Persian Gulf War was fought over oil, and money earmarked for the New Orleans levy before hurricane Katrina (August 2005) devastated the coastline was instead invested by the Bush government into the ongoing Iraq invasion under the banner of the so-called war against terror. But the American media chose to present these invasions as issues of Kuwaiti national sovereignty, the rise of Muslim fundamentalism and related terrorism as well as threats to Israel's security (Ridgeway xv).

Following Marx, the process of commodification itself is, "the way capitalism carries out its objective of accumulating capital or realizing value through the transformation of use values into exchange values" (Mosco 140). Citing Adam Smith, Mosco defines 'use value' as the value derived from the satisfaction of a specific human want or need and the 'exchange value' as the value based on what the product can command in exchange. Thus commodification is "the process of transforming use values into exchange values" (Mosco 141). Water has qualitatively different use values (for example it is necessary to human existence, can be imbued with spiritual and aesthetic qualities, or represent recreational pleasure); under the exchange process it becomes "a homogenized, quantitatively differentiated commodity" valued only by its price (McDonald and Ruiters

21). Marx coined the apt phrase "commodity fetishism" to depict the psychology of consumption itself:

> in *Capital* he wrote that every manufactured object under modern capitalism becomes a "social hieroglyphic"; by that he meant that inequities in the relations of owner and worker producing this object could be disguised. Attention could be diverted from the social conditions under which the objects were made to the objects themselves, if the goods could acquire a mystery, a meaning, a set of associations which had nothing to do with their use. (Sennett 145)

Commodification and "commodity fetishism" are integral to global capitalist expansion where the conditions of production have become geographically decentralized beyond the scope of Marx's writings, though the inequities he cited are intact. Modern telecommunications have enabled companies to relocate production to non-unionized sites such as China, where low wages, lax "business friendly" environmental standards and health and safety regulations (Babe 302) in conjunction with "sweetheart deals on real estate and materials" and in many cases artificially low currency (Pitts 3) are irresistible corporate conditions. The capitalist democracy is "mad for more constantly seeking to decrease production costs" (Artz 3) and companies like Wal-Mart are the high priests of this new-world order. Their dominance in the international market place has enabled them to pressure its more than 65,000 suppliers to cut costs to the bone and has forced American companies as established as Levis to close all its North American factories, "in search of cheaper labour" (Anderson and Cavanagh, 35) far from their point of origin.

In essence, consumer ideology and the hegemonic leadership of global capital present everything within a commodified frame—a frame central to "the marketization of all aspects of life, water included" (McDonald and Ruiters 13). Related to this idea of the commodified frame and neoliberal global economic policies is the push for privatization. The term 'privatization' has been defined in many ways and has deep historical roots bound up with the commons versus enclosure binary. Graham Murdock defines it as "all forms of public intervention that increase the size of the market sector" giving the entrepreneurs operating within it an "increased freedom of manoeuvre" (149). The process of privatization can be broken down into four distinct components: de-nationalization (selling shares in public companies to private investors); liberalization (policies designed to introduce competition into markets that were previously served solely by public enterprise); the commericalization of the public sector (due to rising costs and profit ceilings); and finally the regearing of the regulatory environment (from public interest to the promotion of corporate interests) (150). As he notes the love affair with privatization is not confined to conservative governments—water for instance has been privatized in France for centuries and more recently in Britain (albeit under Thatcher). Another notable characteristic of the process is that it is regarded as a relatively irreversible process, cloaked in an aura of inevitablility and the balance has recently "been tipped permanently in favour of the market in many nations" (Murdock 149). In her Dorset case study on the effects of water privatization in England, Strang concludes that despite the communal unhappiness with private water management a return to a public government run system represents nostalgic thinking and a romantic,

more naive time that is now impossible to retrieve (252). It's a system that we take for granted in Canada, where water privatization seems culturally inconceivable.

Alongside this momentum of privatization initiatives is the language of neoliberal policies that coats contentious issues like the water privatization debate in the "rhetoric of economic privacy" (Fraser 131). It is a rhetoric that, according to Nancy Fraser, seeks to:

> exclude some issues and interests from public debate by economizing them; the issues in question here are cast as impersonal market imperatives or as "private" ownership prerogatives or as technical problems for managers and planners, all in contradistinction to public, political matters. (131-32)

Many governments opt out of being major policy planners and instead function merely as market facilitators for global policies (Babe 285). Often there is not much perceived choice in the matter due to the weakening of national sovereignty, the widening economic gap between the global North and South, and "the callousness of the IMF, World Bank, and other trade and development institutions" (Artz 11). The privatization of national industries and public services including the media and public utilities, has been imposed on developing countries by the IMF and the WB in exchange for debt relief. Different forms of commodification perform different ideological tasks and the agenda here involves the spreading of capitalist democracy. The more transnational monopoly capitalism becomes, the more pressure is exerted on governments to bring their national policies in line with those of the West. National policies that promote de-regulation and privatization work to enhance the powers of those who seek to commodify our common resources further—whether this power extends to information, natural rescources or public utilities. In the case of water, the "ability to pay will surely come to be of even

greater significance in future years" (Babe 304), giving rise to even sharper class divisions between the have and the have-nots.

In a world where privatization rums rampant and access to fresh water is becoming scarce in many regions, water is now on the commodity block. This shortage has not "led to substantial exploration of new sources, but rather to greater exploitation of current ones", making the provisioning of fresh water an appealing investment opportunity (Ridgeway xvi). The two largest private water companies in the world—Suez (the company that built the Suez Canal) and Veolia—are based in France where water management has been privatized since the mid-19th century. It is this model that has been endorsed by the World Bank and the European Union as a blueprint for the future of water management. The water companies, the World Bank and the United Nations have together also created a number of international think tanks including the World Water Council (WWC) which organizes a World Water Forum every three years dedicated to "changing our world water future" through privatization and deregulation (www.corporateeurope.org/observer7water.html). More recently corporate water companies have formed the International Federation of Private Water Operators known as AquaFed to promote private water delivery and sanitation with a focus on the global South.

The debate around water provision has become deeply polarized by those who favour corporate involvement in all aspects of its delivery and treatment and those who are strongly opposed to the "commodification of water". The thrust of the argument for privatization is that government entities are doing a poor job of running the world's water

utilities. Water supply and treatment systems are decaying and in many countries there is simply no funding available to overhaul, expand or update them. One of the biggest supporters is The World Bank who along with the IMF plays a large role in the privatization of water utilities. The World Bank has endorsed privatization as a way of updating aging infrastructures in transitional economies and ensuring efficient, safe distribution of clean water to both remote rural areas and dense urban cores. It has encouraged governments to sell off their utilities to help reduce enormous public debt and this is often an imposed condition (the 'structural adjustment program'), determining to what extent a developing country will have access to the portfolio of loans available in the World Bank's Country Assistance Strategy (CAS) (Grunsky 14). Saul terms this the "cruxifixion theory of economics: you had to be killed economically and socially in order to be reborn clean and healthy" (Saul 38): "The sin of public debt was then broadened by attributing it to public utilities. Running well or not, they had to be privatized and deregulated into a global marketplace to cleanse them of public-sector inefficiencies" (Saul 36). Bolivia's "water war" of 2001 (involving a subsidiary of Bechtel) caused a nationwide uprising and brought a great deal of media attention to this policy, which has ultimately not been successful in the developing world. This failure, Saul states, represents the larger failure of the Globalization project.

The voices raised against turning public water utilities over to the private sector are both numerous and vehement. They include The Democracy Center in Cochabamba, Vandana Shiva the prominent physicist and environmental activist from India, The Washington-based Center for Public Integrity, the Sweet Water Alliance (an American environmental group), the International Forum on Globalization, the Polaris Institute, the

Council of Canadians (Canada's largest public advocacy group), and Public Citizen (a US citizens group). Many anti-corporate lobby groups accuse the large water companies of delivering reduced water quality, demanding higher, unfair prices for water, bribery and corruption. One of the most notable figures in the campaign against corporate control of the world's water is Canadian Maude Barlow. In her essay "The World's Water: A Human Right or a Corporate Good?" (2002), she discusses the distinction between calling this prerequisite for existence a 'right' or a 'need':

> Both the World Bank and the United Nations state that water is a "human need" not a "human right." The difference in interpretation is subtle, yet fundamental. There are many ways to supply a human need. A human right cannot be sold or traded. (*The World's Water* 29)

Barlow argues that to counter the discourse of commodification water must not be framed as a "need" but as a "human right", for the language we use to depict our relationship to this resource will ultimately shape and inform the policies that will govern its use. In 2008 the Canadian government voted against a UN resolution that would recognize access to water as a human right on the grounds that it would open the door to bulk water exports to the United States under NAFTA. Peter H. Gleick of the Pacific Institute for Studies in Development, Environment, and Security, states that by formally acknowledging the human right to water, national and international governing bodies are more likely to work to ensure basic access for their populations. Grounding this access within a framework of social and economic rights helps focus attention on poor water management and watershed disputes and aids in setting specific priorities for water policy. Chander and Sunder examine the romance of the commons, on the other hand,

and the belief that because a resource is open to all by force of law, it will indeed be equally exploited by all. They argue that in practice, differing circumstances—"including knowledge, wealth, power, and ability—render some better able than others to exploit a commons" (1332). Certainly, the commons of fresh water resources is not exploited evenly and watershed conflicts are not easily solved. Disputes in the river basins of the Ganges, the Jordan, the Nile and the Tigris-Euphrates over water rights are intensifying, massive dams have forced the relocation of thousands with little compensation and water shortages are daily occurrences for many while remaining unheard of for the fortunate few.

Canada ranks as one of the most water-rich nations in the world and there is immense pressure to export water to increasingly thirsty America. As far back as the 1960s the House of Commons has been debating Canada's "freshwater security" and the issue of bulk water exports (primarily to the U.S.). This has also involved a re-examination of the terms and conditions of the general agreement on Tariffs and Trade (GATT) and the North American Free Trade agreement (NAFTA) to determine whether water should be treated as "vital resource" or as a "service" or "good" something that could be traded on in the market place. Canadians in general are opposed to water exports and stand accused of being incapable of reasoned debate on the subject dissolving into "a solution of mythic imagery infused with implied threats to our imagery" (Wood 44). However, if Canada refuses to share it water wealth in the decades to come, Maich posits we will "look like the neighbour who leaves his sprinkler on all night while the rest of the street dies of thirst" (Maich 29). Yet if we decide not to cut a deal with the United States, "legal experts agree there is little to stop the U.S. from abandoning the border waters treaty"

(Maich 29). Sarah Ehrhardt of the Council of Canadians counters this argument for commerce in water by claiming:

> if Canada treats any bulk volume of water as a "good" under the GATT description, It will effectively declare all water in the country open to commerce in which foreign companies and customers cannot be treated less favourably than Canadians. (Wood 48)

Even Peter Lougheed, former Alberta premier, states that water, like oil "is a prize of geography to be used in the public interest, and beyond the scope of the FTA – unless Canada mistakenly puts it there" (Wood 49).

McDonald and Ruiters contend that neoclassical definitions of commodity and commodification are being used to justify privatization and commercialization in the water sector. A commodity, in the neoclassical economic sense, is "anything that can be bought and sold in the marketplace in exchange for another commodity or for money" (20); therefore, to be commodified, a good or service must have the characteristics of a 'private good' – it must be rival in its consumption and it must be excludable. 'Public goods' (or 'merit goods') on the other hand resist commodification because they are non-excludable and non-rival. According to neoclassical theory, then, public goods and services (being prone to 'free riders') are too risky for a private firm to invest in producing them. Water lies somewhere between a pure private good and a pure public good or 'merit good':

> Neoclassical theory would therefore argue that water, as a quasi-commodity, only partially responsive to market forces, would be underprovided from a public goods point of view if left entirely to market forces. (McDonald and Ruiters 20)

With the rise of neoliberal global policies over the last thirty years it has not only been argued to be, "theoretically sound to regard water as a private good; it is deemed an economic, social and environmental imperative to treat it this way" (MacDonald and Ruiters 21). To do otherwise, the argument implies, would be irresponsible, leaving water open to waste and corruption.

There is a middle ground in this polemic which maintains that government or public authorities are capable under the right contractual conditions of suitably regulating private companies. Marq de Villiers in *Water: The Fate of our Most Precious Resource* argues that privatization is inevitable as water becomes scarce and that we should not be focussing on who the water belongs to but rather how it is going to be delivered (de Villiers 407). He posits that there is a role for the private sector in the management of water utilities and that a price value must be assigned to water:

> But even from a social—democrat point of view, the increased price of water is the right change (though not the fat-cat salaries or the profits). It is important to signal water's value, and to price it so that waste hurts. The political trick is to balance conservation incentives against the irreducible needs of the urban poor. (de Villiers 406)

The term "public-private partnerships" (PPPs) is often applied to describe this model but the term itself is controversial and encompasses a spectrum of working solutions. Vandana Shiva claims that "public-private partnerships" are deceptive because they suggest public participation, but in reality are merely "international aid for water privatization" (89). Strang concludes her book *The Meaning of Water* by describing them as "an expensive oxymoron" (252). The Canadian Council for Public Private Partnerships

(CCPPP) is a powerful lobby group (created in 1993) pushing for water privatization partnerships in Canada. It has been chaired by two former Canadian finance ministers and its corporate members include executives from United Water, American Water Services Canada Corp, and Bechtel (United States)**.** They reason (as do all proponents of private water systems) that privatization is the only efficient way to access new sources of capital to pay the estimated C$90 billion required in water infrastructure over the next 20 years (Carty 7). Yet if Hamilton's experience with the water business is anything to go by, this logic is surely flawed. The first utility in Canada to privatize their water in 1995, the troubled experience has caused large sewage spills, unpaid environmental fines, rising tariffs for water services and involved five different water companies over an eight-year period.

Strang suggests that the opposition to the private ownership of water is based upon a "fundamental dissonance—a sense that in 'disconnecting' it, privatization runs counter to the organizing principles of a whole array of cosmological schemes" (129) and that there remains still, "a close link between the idea of societal membership, suffrage and rights to water"(132). She argues that privatisation is "a very transparent enclosure" that signals plainly that "wealth—and its related concept of socio-economic health—has been appropriated from 'the commons'" (134). The binary rhetoric of the commons and the enclosure is a defining part of the discourse around the both the commodification of information (intellectual commons) and the commodification of water (an ecological commons). James Boyle suggests that the meaning of these terms shifts as we move from one debate to the next "in part because each project is built around a different set of hopes and fears" (67). He compares the current expansion of property rights to the first

enclosure movement—the enclosure of England's arable land in the 1700s. (E. P. Thompson wrote extensively about "the enclosures" in his book *Whigs and Hunters: the Origin of the Black Act.*) Boyle suggests modeling the movement of the public domain and the notion of the commons after the environmental movement as a means of countering the arguments about "progress" and "growth" and "modernity" and the "political blindness toward the importance of the public domain as a whole" (71). In Toronto during the late 19th century the development of the abstract notion of what ought to be publicly controlled and what ought to be private focused on the local utilities, "where, it was felt, the ordinary rules of commerce could not apply" (Armstrong & Nelles 233). Those who were opposed to publicly controlled utilities contrasted "private efficiency against public incompetence, extravagance, and corruption" (Jones & McCalla 311). Thus, in essence, the tone of the public versus private arguments has not altered much from those held in Toronto during the 1850s.

There is one opinion that all sides of the water discourse seem to share, and that is the fact that usable water is a finite resource, that 2.3 billion people suffer from water borne diseases annually, and that an estimated 1.5 billion people on the planet do not have adequate access to potable water. The World Health Organization (WHO) projects that two-thirds of the world's population will run short of drinking water by 2025. Tensions exist where rivers or other water resources straddle national borders. It is also clear that as human populations increase so too will the demand for water and the need for innovation and political co-operation. Conservation, water pollution controls and efficient water management are elements that must be addressed regardless of political leanings.

In their introduction to *Water, Culture, & Power: Local Struggles in a Global Context,* Donahue and Johnston argue that the story of water is generally a story of "conflict and struggle between the forces of self-interest and opportunities associated with "progress" and the community-based values and needs of traditional ways of life" (3). Barlow and Clark are concerned that in many countries, First Nations' water rights have been expropriated for profit and that indigenous peoples have suffered disproportionately from the construction of massive dams and other water diversion projects. They also note that water is a foundation of spiritual life for many indigenous peoples and any water management solution must respect and honour their proprietary interest in waters on their traditional lands (Barlow & Clark 216).

If we are not alert to the commodification model then we can not educate ourselves sufficiently as citizens to make informed decisions about our collective watersheds; we cannot participate in the public policy debate in a meaningful way. In Andrew Leyshon's article, "Scary monsters? Software formats, peer-to-peer networks, and the spectre of the gift" he describes three rather self-explanatory levels of participants in Internet relay chat room (IRC) communities: the leech, the trader and the citizen. It is the citizen who garnered the greatest amount of cultural capital yet sadly despite this, most participants he notes are at the level of 'leeches' (Leyshon 544). Water use patterns, I imagine, also fall along these lines. Its intriguing to see that despite our society of shoppers and "possessive individualism" (Macpherson 1962) with its general malaise of public apathy, we are still capable of voicing a passionate "aqua nationalism". Maybe Wood is correct about the mythic imagery of water in the Canadian psyche concomitant with the cracks in the "global orthodoxy" as Saul would have it. If Bechtel took up shop in Canada, would

we take to the streets like Bolivia? With our longer history of neoliberal policy and the process of depoliticization, maybe not. Yet nineteenth century Toronto, despite its overtly Conservative culture, opted for a public utilities model having already dealt with the inadequacies of private suppliers. On a related note global warming, due to the burning of fossil fuels, has caused temperatures to rise and as a result the sea levels around the world have risen 4 to 6 inches over the last 100 years (Ridgeway 203). (The US East Coast sea level has risen approximately 12 inches in the last 100 years). The Arctic is a time bomb of frozen peat and our infrastructure is not designed to deal with the overflow of excess water and tonnes of green house gases that will be released as it thaws (Wood 54). The cost of short-term environmental thinking could prove to be very expensive in our collective watery futures.

It is also worthwhile to look to beacons of co-operation in the bleakness of the Information Age, which offer, if not solutions, then an idea of the directions we might take. Barlow and Clark state that it is time to build "a powerful international coalition of community groups, human rights activists, environmentalists, farmers, Indigenous peoples, public sector workers, and others" who could work together to "build a model for a water secure planet" (Barlow & Clark 230). In July of 2001 the Council of Canadians sponsored a summit entitled, "Water for People and Nature: A Forum on Conservation and Human Rights". At this conference an Indigenous caucus made up of First Nations peoples from around the world and led by Chief Arthur Manuel of the Interior Alliance of British Columbia came together to support and create "common strategies in their fight to preserve their ancestral water rights" (Barlow & Clark 231). They endorsed the *Indigenous People's Declaration of Water* which calls among other

things, for the rejection of large scale dams and diversions, and the implementation of traditional water collection techniques such as rooftop or mountain slope water harvesting and Farmer Managed Irrigation Systems (FMISs) that operate for the benefit of the whole community. Italian political theorist Riccardo Petrella, in his book *The Water Manifesto: Arguments for a World Water Contract*, mentions the city of Valencia, Spain - a city with a rich water culture where the Water Tribunal (Tribunal de las Aquas) has run things since 1492. For over a thousand years this tribunal has continued to meet every Thursday at midday on the steps of the cathedral of Valencia to verbally settle "the disputes arising between farmers over the right to use water the channels irrigating 17,000 hectares of what is known as the "Orchard of Valencia" (Green 3). The tribunal is the oldest law court in Europe and represents a working solution based on respect and co-operation. Finally, Jacques Leslie counters the parallel drawn between oil and water with the hopeful edict that "Oil promotes grandiosity; water teaches humility" (46). He reasons that oil belongs to whoever owns the land above it while water, as previously stated in this chapter, is inherently a more complex commodity with its "sprawling underground aquifers and long sinuous rivers" intertwining the fates of the nations it crosses and complicating any form of ownership.

Nancy Fraser, in her essay "Rethinking the Public Sphere: A Contribution to the Critique of Actually Existing Democracy", challenges the notion of the "triumph of liberal democracy" (107) and argues that before we start thrusting this social system at other emerging democracies we need to examine the limits of our own late capitalist society. Fraser defines Habermas's concept of "the public sphere" as a "space in which citizens deliberate about their common affairs, and hence an institutionalized arena of

discursive interaction" (110) which is distinct from both the economy and the state and can in theory provide a forum where people can be critical of the state without reprimand. We need then to expose the limits of our late capitalist democracy and in turn become inspired to improve upon it. Alternative viewpoints to the current global order must consider whether "the dominant image of water as money and money as currency of social relations and nature is adequate" (McDonald and Ruiters 9). Corporate ineptitude and the absence of self-criticism all marked the decline of Globalization. With issues such as mad cow disease, the availability of pharmaceuticals in the developing world (especially aids in Africa), global warming, and "the fresh water sell off people began to notice other contradictions in the Global orthodoxy" (Saul 37). In its wake we will need positive forms of nationalism which entail an international balance in which "the prism of civilization is neither naïve market economics nor national selfishness" (Saul 43). Public policy discourse will continue to be refracted at us through corporate speech and the ideology of commodification for some time to come. We must be willing to address the questions being debated globally in corporate board rooms, in the halls of government and by American intelligence agencies (Gleick 188) and to ask ourselves whether or not we will allow water to become the oil of the 21st century, co-opted by private interests.

Claes Oldenburg, *Colossal Monument: Thames Ball* 1967

CHAPTER SIX
Domestic sphere and the interface with water

All the world over people are becoming more alive to the importance of safe, sanitary surroundings...and a common enough question to be asked now-a-days is: Where does the sewage go to, and where does the water come from?
James Mansergh, Consulting Engineer, Toronto (1896)

If a tumbled pail of water could deliver us from waste, there would not be cause for such ado. But the situation is not so simple.
Dominique Laporte, *History of Shit* (1978)

In this chapter I intend to make the invisible visible once more. Majestic structures celebrating the process of water supply and sanitation such as the R. C. Harris plant have been replaced with the discreet and unobtrusive, underground networks that are buried out of sight and the consumption interface of the private sphere further renders the invisibility of water infrastructure. Buried creeks and streams move through pipes beneath the surface facilitating the flows of water as it is pumped and flushed through the city's distribution system. The vision of Harris and his palace of purification providing access to clean water as an emblem of citizenship and social emancipation in the early 20th century has evolved into a series of solidly constructed needs. The daily shower, our flushing etiquette and a culture of clean all contribute to billions of litres of water wasted, along with a slew of undesirable chemicals down the drains with it. Only when there is a disruption in the normal flow of things in the form of burst pipes, clogged drains or discoloration do we step back from our personal practice to consider the landscape of the invisible.

By drawing on the work of British sociologist Elizabeth Shove (2003), Australian cultural theorists Zoe Sofoulis (2005), Fiona Allon (2006) and Gay Hawkins (2003, 2004), as well as that of social anthropologist Veronica Strang (2004), new connections

to the source of our drinking water and the fate of our waste can be forged. All of these theorists critique the notion of infinite supply that is encouraged via the material form of domestic plumbing. The ease of delivery as water gushes into a kitchen sink or chases away the excrement from porcelain bowls offers escape from any connection or responsibility to both our water supply and the management of our own waste. Daily regimes and cultural habits enmeshed in everyday water use go unquestioned and unmonitored. Our anxieties around smell (Banes 2001), an obsession with highly sanitized bodies and surfaces, and an alignment with morality, order and good health have all contributed to a vast increase in household water consumption in the post-war era.

In *Comfort, Cleanliness and Convenience: The Social Organization of Normality* (2003) Elizabeth Shove probes water consumption patterns buried in the realm of normalised practice, routine and habit. Shove interrogates the specific details of our most mundane domestic rituals to examine the supposed 'normality' implicit in day to day regimes of cleaning and hygiene. Unlike many environmentally inspired analyses which tend to focus on the individual and their choices around the consumption of natural resources, she is interested in the sociology of environment and our conventions of cleanliness and comfort to comprehend collective cultural expectations and practices. Allon and Sofoulis (2006) also stress the importance of investigating the ordinary, unspectacular dimensions of daily life by "scrutinising those rituals of water use" that have become inconspicuous practices of consumption (47). It is no coincidence that these theorists have turned their attention to water consumption for their native Australia is the driest inhabited continent in the world, due to low rainfall and more recently climate

change. But the water crisis in Australia is at the same time a cultural and socio-technical one, a crisis where many of the "modern trajectories" folded into our existing water systems and the distinctions between private use and public responsibility must be redefined (Sofoulis 460). Sofoulis is passionate about employing a cultural approach to societal attitudes, the embrace of "Big Water" and domestic consumption patterns. She argues that "humble domestic users" are blamed for living with systems and technologies intentionally designed to deliver "the sublime illusion of endless supply" integrated into their everyday use and now are expected to shoulder the moral, financial and practical responsibility for saving water. All this, despite over a century of governments and utilities usurping that responsibility "in the name of modernity and progress" (460). This "demand management option" to reduce waste consumption is employed on the part of government to blame the user and demand they change, she argues, because it requires no alteration to the "technical, social or political aspects of water management, and no reallocation of public funds" (457).

Noted Australian theorist Gay Hawkin's recent work focuses on the intersections between cultural and material practices and varying forms of rule. Much of this research centres on our personal relationship to the waste we create both externally and internally through the body as we move through time and space. Hawkins states we are all "waste-making organisms" and "shit is merely the bottom line of the body's biological identity" (Shit in Public 3). Hawkins also points to the kitchen and the bathroom as sites of domestic purification where drains facilitate the "endless process of escaping what isn't connected to self" (49). Like Shove and Sofoulis she cites the official environmentalism mandate to "improve the waste habits of recalcitrant subjects" while completely ignoring

the role modern waste infrastructure has played in the pollution of oceans: "Reforming personal relations with drains does not change a whole history of sewer construction in which rivers and oceans were used as convenient sites of elimination" (*Down the Drain* 49). In turn, Strang locates her rich ethnography of water on the River Stour to explore the social, spiritual, political and environmental meanings encoded in water. She too is interested in her subjects' attitudes to water use and its meaning in the socio-political context of privatization and Thatcher's England arguing that water supply technology was initially designed to prompt "precisely the unlimited, potentially profligate use of resources" that water companies and conservationists are now discouraging (198). For Strang, the unlimited access to running water has historically represented luxury and privilege and an "endless supply of 'wealth'" (198) and these images tightly conflate ideas about health, morality, and cleanliness for which "the only antidote to the converse - death, immorality, dust and dirt - is water" (202). The legacy of the powerful associations between water, wealth and social potency is a major obstacle to conservation efforts.

Turning on the household water tap activates a complex chain of events. Water in volume adequate to meet the needs of a community is first collected, stored, and transported to a distributing reservoir or main pumping station. From there it enters a distribution network consisting of mains, smaller pipes, treatment plants, and pumping stations. Water mains are laid along street patterns and lateral lines connect to fire hydrants; service lines connect to household taps (Anderson 195). These massive public infrastructures and the almost invisible domestic hardware they hide behind support all manner of "discourses and practices of hygiene and cleanliness" (Sofoulis 454). Modern plumbing has "altered

the disciplines of bodies, the ways we manage and map them, experience them as clean" (Hawkins, 2004, 9 cited in Sofoulis). These mappings and experiences are entrenched in the small, performative act of turning on a tap, adjusting temperatures and pressing the chrome buttons that link us to the magic of a vast, subterranean hydraulic apparatus. British writer Ian McEwan highlights the surreal extravagance of 21st century hygiene in his novel *Saturday*:

> He steps under the shower, a forceful cascade pumped down from the third floor. When this civilisation falls, when the Romans, whoever they are this time round, have finally left and the new dark ages begin, this will be one of the first luxuries to go. The old folk crouching by their peat fires will tell their disbelieving grandchildren of standing naked midwinter under jet streams of hot clean water, of lozenges of scented soaps and of viscous amber and vermilion liquids they rubbed into their hair to make it glossy and more voluminous then it really was, and of thick white towels as big as togas, waiting on warming racks. (149)

Our critical infrastructures' current hidden form contributes to the process of commodity fetishism. As Maria Kaika states, the "end of visible flows into the domestic sphere became naturalized and inevitable, yet severed from any apparent connection to anywhere else" (47). This lack of knowledge or connection to the source of the water we drink from is what Hawkins calls an "active not knowing". Pipelines connect the home to the larger spheres of government and commerce and all public utilities, including water and gas, are potentially transgressive connections between these private and public realms, intrusions into the domestic sphere carrying unnamed dangers (Wilk 311) via the household taps. Civic pipelines not only carry potable water to the domestic sphere, they

cycle away our own biological waste back to the process of filtration and hydraulics. It is this personal waste that Hawkins argues is most threatening to the deodorized self and therefore must be "rendered out of sight and mind as quickly as possible" (*Shit in Public* 1). Again, our interface with these processes separates us from the fact that many said transgressive intrusions into our water supply may ultimately be of our own bodily making. When the storm sewers overflow after a heavy rain and "shit is in the air" as Hawkins puts it (*Shit in Public* 1), it is our collective shit, a blend of "our rituals of cleansing and disposal" (Hawkins *Down the Drain* 49) that we have sent down the civic pipes connecting us to government and commerce. The overflow is not merely a failure of infrastructure in the realm of municipal sanitation; we are, both as waste producing organisms and as citizens, deeply implicated in the pungent smells emanating from the sewer grates.

Even in the mid 1800s Dr. John Snow found that once the inhabitants of London began to collect water from a piped tap, they often did not know the source of their water supply even though most water was drawn from the rivers that flowed toward and through the city they lived in. Initially, piped water was strictly for washing or cooking and well water was pumped for drinking. Over time the water that flowed through the tap so effortlessly nurtured a dangerous delusion and the sewage flowing into the Thames turned the tap water deadly with cholera (Morris 52). This continues to be a delusion to this day despite advances in filtration and sanitation processes. In the early 21st century Hawkins writes on the lingering spell of the drain:

> Putting shit into circulation, washing it away has long been part of the alchemy of "waste management". But when the smell persists, when its presence reminds us

> of the materiality of its referent, the magic of the drain fades and we become uncomfortably aware of the fate of our waste. (*Down the Drain* 40)

Microbiology opened up a wide new horizon in the nineteenth century that connected public health and drinking water. As a society this knowledge is deeply understand yet ironically the trash decanted into our waterways today is thick with unseen toxins in the form of industrial waste, agricultural run off, hormones and anti-depressants. Even the merits of fluoride, which was added to the filtration process in Canada during the mid-1950s have been fiercely debated for decades. Activists and critics advocating for fluoride-free drinking water cite rare cancers and fluorosis as viable concerns, and despite the public health benefits of lower tooth decay rates (20-40%) Health Canada is calling for fluoride levels in tap water to be reduced. The epidemiology of drinking water reveals invisible pathogens in our tap water; human pathogens could penetrate the barriers erected by conventional water treatment plants to cause disease without it being recognized as waterborne and many pathogens like cryptosporidium and toxoplasma are chlorine resistant (Morris 233). Chlorine itself (and its toxic byproducts) used effectively for decades to protect us from the spectre of typhoid and cholera, may actually threaten our health in other alarming ways including "cancer, still-births, and birth defects" (Morris 234).

As has been the fate historically of all moving bodies of water, the ocean is still regarded as a giant waste management facility (Hawkins *Shit in Public* 5*)* with outfalls reaching further and further from the shoreline. Rivers and lakes continue to be viewed as infinite sites of elimination where the science of dilution is at play and bathrooms are rarely targeted as a crucial area of reform. The self is no longer implicated in the

management of our bodily fluids and solids once the toilet bowl is emptied; it is then "transformed from shit to effluent" (Hawkins *Shit in Public* 8) or to public sewage and "publics involve the active suspension of selfhood, the denial of any sense of particular bodies with their messy biological processes" (*Shit in Public* 2). A faith in infrastructure and the great modernist promise that sanitation would do away with waste persists despite the vain aspect of this quest. There is always a relationship between elimination and return and we can never fully escape the fate of our own excrement. Despite the heroic engineering of the early 20th century and the origins of modern public health the sewer also is "what literally connects shit as public problem and shit as private secret" (Hawkins *Shit in Public 3*). The not so secret truth is that "all liquids, even thick ones, must be made to circulate" (Laporte 27) and the "desire for elimination as absolute separation is always thwarted" (Hawkins *Down the Drain* 40). Yet the limits to the filtration process are to a certain extent felt by people particularly after a rain storm overwhelms the capacity of local waste disposal systems and contaminates sites of supply and pleasure.

Buying bottled water when clean tap water is readily available is one avenue for confronting that limitation, a somewhat misplaced consumptive practice based on the vague notion that groundwater is pristine and unharmed by human hands. The illusion suggests that if we pay enough we can avoid the consequences of 'shitting in our drinking water'. Anthropologist Richard Wilk posits consuming bottled water is an attempt "to deal with a generalized fear of the 'uncontrollable human-generated hazards' that characterize late modernity" (316), for every bottle of water "is a visual metaphor of control" (308). On the other side of the natural purity that bottled water has come to

represent is the "equally important question of how public water has come to be seen as dangerous and dirty" (Wilk 311). Marketers are hired by the bottled water industry to aid in their attempts to frame tap water in a negative light. By offering us a safety that tap water cannot, bottled water then is positioned to further reinforce "our mistrust of governments and communities, and erodes the idea that citizenship is the best avenue towards the public good (Trentmann, 2001)" (Wilk 317). Yet bottled water is an unregulated industry, dominated by Nestle, Danone, Coca-Cola and PepsiCo. (Barlow *Our Water Commons* 8-9) and there are no guarantees that purity in a vessel of plastic is what you have in fact purchased. Less than five percent of these bottles are recycled; plastic water bottles are composed of chemicals and fossil fuels, which seep into groundwater and in turn our own bodies. Water extraction to support the bottled water industry is draining community watersheds "from the Great Lakes of North America to the rural villages of India" (Barlow 9) and corporations pay little or no extraction fees for the privilege of openly profiting from local water commons.

The importance of global health is born of not only compassion but of enlightened self-interest, just as nineteenth century Toronto had to understand the public benefit in providing the poor with a clean water supply, for it is a problem too costly as a society to ignore. Tension between the costs involved and public health protection are real and ever present and distance will provide limited protection (Morris 268), for water is by nature an unruly commodity heedlessly flowing across nations to reach the oceans which cover seventy-one percent of the Earth's surface. Local solutions to site specific water problems are needed for there are too many variables for any one globally imposed idea to work.

Water infrastructure and regulatory changes require big capital investments and drinking water industry lobbyists will work to slow down and weaken these efforts. Notions of purity must be dropped and we must ask ourselves honestly: so what is clean enough? Water treatment appears a simple process—filter, disinfect, drink. It mimics to a large degree what soil, sand and clay do to water naturally en route to underground aquifers, but in reality there is no fail-safe method to treat polluted water on our densely populated planet. Neither the quality nor quantity of our water supply is a concern that is broadcast every time we engage with the tap or other sites of consumption. (A small somewhat amusing exemption to this exists where a 'fouling' is announced at a swimming pool, emptying all humanity from the water in short order.) The daily shower, endless loads of laundry and a love affair with lawns and gardens continues unabated despite the current fervor for environmentalism. We resist the disturbing notion that most of us drink highly treated sewage, that we bath or swim in our diluted collective waste and the by-products of industry and agriculture, and we remain firmly attached to the cultural notions of civility and cleanliness embedded in our water habits.

The sociotechnical system of Big Water and the 'saver unfriendliness' of standard water fittings in the home does not prompt one to normally entertain "an attitude about a tap, a drain, or a sewage pipe" (Sofoulis 448). The ease embedded in our interface with domestic water supply has made it easier for the water barons to quietly move in. Debates around the ownership and management of fresh water have sparked a shift towards a different kind of water culture as our consumption patterns become unsustainable. To shine a light on the invisible and make the flows of water publicly visible could perhaps prompt a rethinking of our collective water culture and conventions. A strong example of

this happened in July 2005, when Mark McGowan, a British performance artist let a tap run in the House Gallery in south London to protest the private control of water. Calling the piece *Running Tap*, the press release stated provocatively: "Artist to waste 15 million litres of water". His intention was to leave the tap running for one year but Thames Water threatened to cut off the gallery's water supply so he turned off the faucet after a month long run. Pouring water against a backdrop of drought in England was ironic, raw, political art and many were enraged by his wasteful performance. McGowan commented publicly that he felt it might cause people to think differently about water as a resource though he doubted the water company would do anything about London's aging infrastructure and leaking pipes. His work touched a nerve in the public and many visitors to the gallery simply took matters into their own hands and turned off the tap. Another earlier public work involving the city of London is Claes Oldenburg's proposed *Colossal Monument: Thames Ball* (1967). Depicted in the exhibition catalog *Object into Monument* for the Pasadena Art Museum as:

> A giant copper ball, based on the form of a toilet float, which is connected to the center of one of the bridges in the Thames. The ball rises and falls with the going out and coming in of the tide. (Barbara Haskell).

This massive art piece which moved up and down with the water level of the highly degraded Thames River like the plumbing in a toilet brought "the technology of water borne sewage literally out of the closet" making it an "active public monument" (Van der Ryn 28). The dumping of raw effluent into the Thames was finally banned in the 1960's and the success of the river's rehabilitation project boasts the recent return of seahorses, angel sharks and numerous fish species to the river (Hilmelfarb F7).

A Canadian piece called *The Fall of Water* (2007) by political artists Carole Conde and Karl Beveridge uses Peiter Bruegel's *The Fall of Rebel Angels* (1562) to launch a vividly detailed, horrifying vision for the future of water. In this canvas "costumed actors and exotic props" generate "a dazzling apocalypse" of "dead fish, oil-covered birds, military and corporate thieves, disease, dam builders" (Dault, R16). All of these artists offer an aperture to view or reveal the unconsidered landscape. In these spaces of illumination they create where time is momentarily suspended, our attention is focused on the invisible and the hidden folded into the fabric of the everyday. As we pause in time and space new details may come into relief and our attitudes and habits may be provoked and reevaluated. In Toronto, another example of highlighting the invisible is a work entitled *Water Colour* (2001) by Michale Dave and Delwyn Higgins. Installed on the Toronto Island filtration plant it involved more than 600 manholes bordering the site painted over in colours that "the lake itself reflects at different times of day" (Sandals 44). These innocuous portholes to the city's drinking water infrastructure are beautifully displayed on the ground forcing pedestrians to linger or hesitate at these "entry points to the city's drinking water filtration system" (Sandals 44) before moving on. Toronto artist Jon Muldoon photographs the buried waters and trunk pipes of the city's forgotten creeks while geographer Michael Cook (York University) maps Toronto's 9,000 kilometers of r4sewers to make visible messy conduits unseen from the surface (www.vanishingpoint.ca). The late Jeff Chapman known as "Ninjalicious" published a zine called *Infiltration* in 1996, subtitled "The Zine about going places you're not supposed to go" documenting this type of illicit urban exploration of hidden infrastructure (www.infiltration.org). Recently Cook and his team tackled the Garrison

Creek sewer which runs below my Toronto neighbourhood, its hidden presence stamped by bronze plaques and name plates inserted in sidewalks to reawaken water memories of the past. In the same vein, Trout Unlimited splashes yellow fish on storm drains as vibrant reminders that street grates are part of the underground network that flows downhill to Lake Ontario.

As public water supply moves from Latour's depiction of a matter of fact to a matter of concern, how can, as Hawkins asks, "new practices of ecological citizenship and everyday intimacy" (*Shit in Public* 3) be generated? And what would those practices look like? Shove seeks to redefine normal practice and our standards of comfort, cleanliness and convenience not via the unit of individual behaviour, but through a transformation of collective conventions and socio-technical regimes, for in the end, she argues, "what people take to be normal is immensely malleable" (415). One form of this transformation is put forth by Hawkins in what she describes as the physical reality of the sustainable house, dubbed "the house without drains" where waste wasn't eliminated but rather managed (51). A reliance on recycled water, rain barrels, solar panels, and a worm farm (delightfully disguised as garden bench) for sewage matter allows this remarkable house to function off the grid. Sofoulis argues that a culture of water sustainability requires change in the relations between the "large scale socio-technical systems, the objects (water and water technologies), and the habits and expectations of users" (460). Strang too reiterates the meanings of water as a social substance and points to the important connection between the local, collective involvement in resource management and the "collective responsibility for limiting demand" (251). For this transformation of

collective conventions to come about it seems clear there must ultimately be a shift in the "distinctions between private use and public responsibility" (Sofoulis 460). To reshape what we take as normal in the realm of water practice will also require the formation of social, cultural and political linkages with the vast subterranean grid of pipelines and sewer trunks, pumping stations and filtration plants to bring about meaningful, sustainable citizenship and everyday practice.

Frank Lemir, *R.C. Harris Filtration Plant* 2009

CHAPTER SEVEN
Conclusions

Desalination plants will ring the world's oceans, many of them run by nuclear power, corporate nanotechnology will clean up sewage water and sell it to private utilities who will sell it back to us at a huge profit; the rich will drink only bottled water found in the few remote parts of the world left or sucked from the clouds by machines, while the poor die in increasing numbers. This is not science fiction. This is where the world is headed unless we change course.
Maude Barlow, *Blue Covenant* 2007

We each live in a watershed and we need a literacy of place that helps us understand how we are connected to that watershed.
Brock Dolman, *Watershed Literacy: Restoring Community and Nature* 2008

The Harris Filtration plant is an iconic Toronto landmark, a lavishly built municipal structure in which every detail presumes the presence of a public audience. It is a visible monument to civic works that exudes "an eerie timeless quality" (Ledger 6), a linkage between democracy and drinking water. Yet much of that meaning has been lost. Modernity, the story of progress and the ideology of human emancipation are bound up in the Harris site; a structure built in a heroic era of engineering and city building. The local historical specifics of water issues, the tracings of habits and cultural practice in early 20th century Toronto are also embedded in the site. Cesar Daly the 19th century architectural critic, describes the past as being "carried forward to the present through these sites" for a "city's streets, monuments, and architectural forms often contained grand discourses in history" (Boyer 31). While tours of this 'Palace of Purification' by the lake have been lost forever to the age of terrorism, we can recover some of the essence of its narrative, not in a naive way with a wide eyed belief in the myth of progress but rather, as Deleuze states "by making the past active and present to the outside so that something new will finally come about" (Boyer 28). It is not nostalgic

longing for the monumental form that we require, but a material re-imagining. Something that might highlight anew the cyclical nature of urban water supply, and the intricate process that reconstitutes it back through our filtration infrastructure to become a potable resource fit for our consumption as a society and a culture.

I detailed in Chapter three, the pressing issue of procuring a safe water supply for the city of Toronto in the first decades of the 20th century. Pollution and waterborne epidemics were part of the grim social and cultural context an ambitious R.C. Harris worked to overcome. A great period in urban municipal politics that gave rise to the modern theory and practice of public health, the R. C. Harris Filtration Plant (1941) stands as an emblem of modernity and the marvels of hydraulic engineering which assured every citizen of the social right to clean water. We no longer celebrate the material networks of water supply such as Harris and his public works department fought to achieve; filtered H_2O has become another commodity with no reference to the production process. By the mid-1950's in Toronto, when the east wing of the R.C. Harris plant was being completed, "its chic styling and all it stood for—strong national revival, government sponsored public order and uplift, renewed mass politics—was dead" (Bentley Mays 269). The International Style and High Modernity had emerged. Despite being a city situated on the shores of a Great Lake local water memories of epidemics, cesspools, fouled creeks, wells and water towers have all been buried beneath us or lost to the myth of abundance and the fantasy of unending supply.

In Chapter four, I discussed the historical legacy and relationship between water supply and sewage disposal in the city. This section focused on the cyclical journey water makes both literally and metaphorically from sites of production where it is pumped out

of lakes and rivers, channeled through an assortment of filtrating apparatus and swept out to the vast piped network as an engineered hybrid to sites of consumption. The notion of a personal "water address" can highlight the absence of a relationship to the source of our drinking water and aid in establishing a local literacy of place. The R.C. Harris Plant draws water from the depths of Lake Ontario—a great Lake that eventually joins the St. Lawrence River and flows on to the Atlantic Ocean. A deeper understanding of how we are connected to our communal watersheds and in turn the larger journey water makes when it drains away from sites of consumption can prompt us to pause before flushing. In short the decorative ocean shells clustered on many bathroom shelves are visual clues to the endless cycle of filtration we engage with in our collective rites of cleanliness and hygiene.

The work of Bruno Latour has offered this thesis a loose framework for positioning the narrative of the Harris Filtration Plant within the context of the fresh water debate. This idea that "objects become things" at a point "when matters of fact give way to their complicated entanglements and become matters of concern" (41) is useful to apply to a crisis whose entanglements with which we will be forced to engage with in the coming decades. In many parts of the planet particularly in the Global South, water has been an issue of concern for many years, however, in our water rich nation its "complicated entanglements" remain in the realm of science fiction. The potable water supply in Canada cannot merely be viewed as a "matter of fact" in the face of our own unsustainable practice and encroaching shortages in the American southwest so close to our borders. The impending water crisis is not merely a question of scientific prowess but

one of management and cooperation. Historical memory, cultural attitudes and conventions all have a large role to play in the establishment of a new water literacy.

I explored the intersections of neoliberal policy, commodity culture and the fresh water commons in Chapter 5. In the West, we are devouring water blind to the growing global crisis. Our continued negligence and grossly inflated appetite for water signals a very privileged access to this resource (Strang 198). A "practical affluence" exists where fresh water is seemingly abundant yet "the water supply infrastructure—the glory of the Victiorians—is crumbling away, and in a shaky global economy investors are harder to find" (Strang 250). Water must be treated to be drinkable in the 21st century and the engineering part of the equation requires deep economic investment. Water has become a commodity, or a "quasi-commodity" (McDonald and Ruiters 20), transnational and uncooperative by nature, that lies somewhere between a pure private good and a pure public good. Whether or not to privatize water services has become a highly polarized, political debate involving our worldview of water, and of society. Astrida Neimanis, a professor of peace studies at McMaster University, suggests any resolution must begin with the premise that we are all bodies of water. She questions whether a water ethic that starts by guaranteeing our right to water would be sufficient to:

> address our more-than-human siphonings, spillages, and containments? An individualistic and anthropocentric human rights paradigm cannot account for all of the bodies I take up... Perhaps instead we need to begin by recognizing that we are all part of a radically embodied hydrocommons. (91)

A resource growing ever more scarce, water must be well managed regardless of our political leanings and the system we employ, and as a society we must be prepared to

make space for this collective debate. Innovation, local responsibility and international political co-operation will be required to navigate and negotiate a workable set of water ethics.

The ease embedded in the domestic interface with waste supply and sanitation was the focus of my enquiry in Chapter six. Water habits have become a series of highly constructed needs, and routines go unscrutinized unless there is a disruption in service. Visible infrastructure has been replaced with the discreet and unobtrusive, underground networks are buried out of sight, and the consumption interface of the private sphere further renders the invisibility of water infrastructure and the distribution system. Water supply technology was initially designed to prompt "precisely the unlimited, potentially profligate use of resources" that water companies and conservationists are now discouraging (Strang 198). Shining a light on the invisible and making the flows of water publicly visible could perhaps prompt a rethinking of our collective water culture and conventions and form a sense of its value and our "connection to larger lifeworlds" (Allon and Sofoulis 45). I extended this line of reasoning to several examples of art that function as illuminators of everyday water use creating an aperture or portal to things deemed previously unremarkable. To make the invisible visible once more requires a shift to different water practices; ones that are informed by a culture of sustainability. A political culture of the visible that could build permeable roads to filter rain, install grey water recycling in every home, banish the front lawn and make everyone one of us "regular attendees at our local water and sewerage management committee" (Sofoulis 460), and card carrying members of the neighbourhood bathhouse.

A new monumental civic project is under way in Toronto in the first decades of the 21st century that seeks to restore the city's connection to the lakefront. Like the visionary network of pumping stations, filtration plants and reservoirs Harris and his Toronto Water Works Extension (TWWWE) put in motion, this project will require large measures of civic optimism and economic investment. John Bentley Mays depicts this "transfiguration of abandoned urban docklands throughout the industrialized world" as the "largest exercise in city building since suburbia" (*On the Waterfron*t 69). Toronto, New York, London and Shanghai along, with a slew of other former port cities across the globe are engaged in design schemes that above all promise "public access to the once-industrial water's edge" (*On the Waterfront* 70). Toronto's lakeside revival involving 810 hectares of downtown real estate is estimated to cost $17 billion, using both public and private money over the next thirty years (*On the Waterfront* 69). Ironically, the Toronto waterfront has been an unrealized large-scale civic venture since the 1800's. Shoreline plans, scuttled repeatedly by the power of industry and the historic monopoly of the railway (which relied heavily on easy access to water) are now once again on the city's books. The Toronto Waterfront Revitalization Corporation (TWRC) government brochure (2007) proclaims: "Toronto's history began at the water's edge. Now it's essential to our city's future. Water revitalization is happening." A gateway to the city is imagined in this visionary turn of urban planning aimed at connecting the former harbour of Lake Ontario, the source of our water supply and site of recreational pursuits, back with the downtown core of the city. The firms Rotterdam's West 8 and Toronto's du Toit Allsopp Hillier (dTAH) are responsible for the design of the central waterfront. Adriaan Geuze, RotterdamWest 8's senior designer states, "What we want on the waterfront is

someplace lighter, different—with the smell of boats and wooden boardwalks wet in the rain. It will be a place where people smell and understand, and where they remember" (Bentley Mays *On the Waterfront* 72). Water has throughout human history been a social resource drawing people to the well, the bathhouse, public pumps and open taps. A tool for healing and renewal, with "the ability to mirror the water of dreams" (Illich 76) it also has the potential as a substance unlike oil to teach us to live in the reality of our communal dependence. A revitalized waterfront (dotted with public drinking fountains) carved out of the aftermath of modernity's creative destruction could add much to water citizenship. Through this renewed post-industrial landscape, a "literacy of place" can also be established to foster understandings around the legacy of our local watershed and its management, the process of purification and our personal use patterns.

Harris's architectural emblem by the lake is alive with its purpose as a pumping and filtration site with a maximum daily production capacity of 758 million litres. A new, largely underground, Residue Management Facility designed by Ken Mains of CH2M Hill (the successor firm to Gore, Nasmith & Storrie) was completed in 2007 to treat residues left over from the water treatment process. How do the issues of the 1930s resonate with the cultural, social context today? What has been resolved since the Harris site was built and perhaps more importantly, what can be? Certainly we still lack the political imagination to pay deep amounts from the public purse towards pollution problems or badly needed infrastructure maintenance. Lingering toxins and chemical sediment covers the murky bottom of Lake Ontario, the source of our drinking water; like bacteria in the late 19th and early 20th century, we can't see it and on many levels a willful

blindness to the long-term health risks persists. Toronto has a rich history of public-mindedness, possessing a civic memory pertinent to the contemporary privatization debate. The basic practical aim for Roland Harris and Dr. Charles Hastings was universal access to clean water and the protection of public health— something for which the Maude Barlows of the world are still fighting in many regions of the world.

Priscoli suggests that "expanding the dialogue to include our water history will help build new ground for debate and consensus building on water and conflict" (625). In constructing the local historical narrative of the R.C. Harris Filtration Plant a small contribution to the discourse of water governance can be made. The civic water memories anchored in the Harris site are "not simply a recollection of times past" they are "visualized in masonry and bronze" (Johnson 294). The buried creeks and streams that flow south to the lake, the intake pipe built two miles out to pull raw water up to the building on the bluff, and the city's devastating waterborne epidemics are all folded into the deco detailing and marble floors. The connection made between cholera and water polluted by human excrement in 1854 has influenced greatly the way we filter and treat our drinking water, yet the underlying pattern of behaviour goes unchallenged. We still shit in our drinking water relying on the centuries old science of currents, dilution and dispersal. The water carriage system is firmly entrenched in our culture, as is a faith in the miracle of science to better the process of purity. Patterns such as this emerge in the historical narrative and are echoed in our current water crisis; however, these collective "histories of water management and conflicts" are also full of imagination and resilience lending hope to a new policy framework (Priscoli 624). The Toronto harbour is not the filthy cesspool it once was and Atlantic Salmon are being reintroduced to the lake via the

Credit River. The great period of municipal governmentality in early 20th century Toronto led by R.C. Harris and his extraordinary Public Works Department illuminates the power of transformative, urban planning and inspires an investment in thoughtful citizenship in our contemporary context. The ambitious scope of the Toronto Waterfront Revitalization project - now known as WATERFRONToronto - offers a timely vehicle for renewed engagement with the city, its civic memories and storied shoreline, and the water that runs off roofs and pavement en route to the lake we drink from, before flowing out to the sea.

Bibliography

Allon, Fiona and Zoe Sofoulis. "Everyday Water: cultures in transition". *Australian Geographer* 37.1 March (2006), 45-55.

Anderson, Sarah and John Cavanagh with Thea Lee and the Institute for Policy Studies. *Field Guide to the Global Economy*. New York: The New York Press, 2005.

Anderson, Letty. "Water Supply". *Building Canada: A History of Public Works*. Ed. Norman R. Ball. Toronto/Buffalo/London: University of Toronto Press, 1988. 195-220.

Armstrong, Christopher and H.V. Nelles. "The rise of civic populism in Toronto 1870-1920." *Forging a Consensus: Historical Essays on Toronto*. Russell, Victor L., ed. Toronto: University of Toronto Press, 1984. 192-237.

Artz, Lee. "Globalization, Media Hegemony, and Social Class". *The Globalization of Corporate Media Hegemony*. Eds. Lee Artz and Yahya Kamalipour. Albany, New York: The State University of New York Press, 2003. 3-31.

Babe, Robert. "Convergence and the New Technologies". *Cultural Industries in Canada: Problems, Policies and Prospects*. Ed. Michael Dorland. Toronto: James Lormier & Company, 1996. 283-307.

Baird, Timothy C. "A Composed Ecology: After 20-plus years, how is Herbert Bayer's renowned Mill Creek Canyon Earthworks holding up?" *Landscape Architecture* March 2003.

Bakker, Karen. "Archipelagos and Networks: Urbanization and Water Privatization in the South." *The Geographical Journal*, 169.4 (Dec. 2003): 328-341.

---. "Commons or Commodity? The Debate over Private Sector Involvement in Water Supply." *Eau Canada*. Ed. Karen Bakker. Vancouver & Toronto: UBC Press, 2007. 185-204.

---. "Neoliberalizing Nature? Market Environmentalism in Water Supply in England and Wales". *Annuls of the Association of American Geographers*, 95.3 (2005): 542-565.

Baldwin, Douglas. "Sewerage". *Building Canada: A History of Public Works*. Ed. Norman R. Ball. Toronto/Buffalo/London: University of Toronto Press, 1988. 221-244.

Banes, Sally. "Olfactory Performances". *TDR: The Drama Review*, 45.1 (Spring 2001): 68-76.

Barlow, Maude. *Blue Covenant: The Global Water Crisis and the Fight for the Right to Water*. McClelland & Stewart, October 2007.

---. *Our Water Commons: Towards a new freshwater narrative*. The Council of Canadians. 2007. www.canadians.org/water

---. "The World's Water: A Human Right or a Corporate Good?" *Whose Water Is It? : The Unquenchable Thirst of a Water-Hungry World.* McDonald, Bernadette and Douglas Jehl, eds. Washington, D.C.: National Geographic Society, 2003. 25-39.

Barlow, Maude and Tony Clarke. *Blue Gold: The Fight to Stop the Corporate Theft of the World's Water*. New York: The New Press, 2002.

Benidickson, Jamie. *The Culture of Flushing: A Social and Legal History of Sewage*. Vancouver: UBC Press, 2007.

Bentley Mays, John. *Emerald City: Toronto Visited*. Toronto: Viking, 1994. 266-269.

---. "On the Waterfront". *Azure* 22.171 (Oct. 2006): 68-72.

Biro, Andrew. "Half Empty or Half Full? Water Politics and the Canadian National Imaginary." Bakker, Karen ed. *Eau Canada*. Vancouver & Toronto: UBC Press, 2007. 321-333.

Black, Maggie. *The No-Nonsense guide to Water*. London: Verso, 2004.

Boyer, M. Christine. *The City of Collective Memory: Its Historical Imagery and Architectural Entertainments*. Cambridge, Mass. & London: The MIT Press, 1996.

Boyle, James. "Forward: The Opposite of Property". *Law and Contemporary Problems* 66.1 & 2 (2003): 1-19.

---. "The Second Enclosure Movement and the Construction of the Public Domain." *Law and Contemporary Problems* 66.1 &2 (2003): 33-74.

Calvino, Italio. *Invisible Cities*. William Weaver, trans. New York & London: Harcourt Brace Jovanovich, 1974.

The Canadian Lancet 15.1 (1882): 26-27.

Carty, Bob. "Hard Water: The Uphill Campaign to Privatize Canada's Waterworks." *The Centre for Public Integrity/The Water Barons*. 13 February 2003.

Castree, Noel. "Commentary: Commodity/Economy/Culture". *Environment and Planning A* 33 (2001): 1519-1525.

Castro, Jose Esteban. "Urban water and the politics of citizenship: the case of the Mexico City Metropolitan Area (1980s-1990s) *Environment and Planning A* 36.2 (2004): 327-46.

Chander, Anupam and Madhavi Sunder. “The Romance of the Public Domain.” *California Law Review,* 92 (Oct. 2004): 1331-1373.

Cheru, Fantu. “Overcoming apartheid’s legacy: the ascendancy of neoliberalism in South Aftrica’s anti-poverty strategy.” *Third World Quarterly*, 22.4 (2001): 505-527.

“Civic Plants Not Intended as Palaces of Public Entertainment.” *Toronto Evening Telegram* 26 July 1938.

Conca, Ken . *Governing Water: Contentious Transnational Politics and Global Institution Building*. Cambridge, Mass. & London, England: The MIT Press, 2006.

Coronil, Fernando. “Towards a Critique of Globalcentrism: Speculations on Capitalism’s Nature”. *Public Culture* 12.2 (2000): 351-374.

Dagger, Richard. “Metropolis, memory and citizenship.” *Democracy, Citizenship and the Global City*. Ed. Engin F. Isin. London & New York: Routledge, 2000.

Donahue, John M. and Barbara Rose Johnston, ed. *Water, Culture, & Power: Local Struggles in a Global Context*. Washington, D.C.: Island Press, 1998.

Dault, Gary Michael. “The personal is the political is the artistic”. *Globe and Mail* 17 May 2008, R16.

Elyacher, Julia. “Empowerment Money: The World Bank, Non-Governmental Organizations, and the Value of Culture in Egypt.” *Public Culture*, 14.3 (2002), 493-513.

Escobar, Arturo. “Beyond the Third World: imperial globality, global coloniality and anti-globaliation social movements.” *Third World Quarterly*, 25.1 (2004), 207-230.

Estache, Antonio, Andres Gomez-Lobo and Danny Leipziger. “Utilities Privatization and the Poor: Lessons and Evidence from Latin America.” *World Development*, 29.7 (2001): 1179- 98.

Fraser, Nancy. “Rethinking the Public Sphere: A Contribution to the Critique of Actually Existing Democracy.” *Habermas and the Public Sphere*. Craig Calhoun, ed. Cambridge, Mass.: MIT Press, 1992. 109-142.

Gleick, Peter. “The Human Right to Water.” *Water Policy*, 1.5 (1999): 487-503.

---. “A Soft Path: Conservation, Efficiency, and Easing Conflicts over Water.” *Whose Water Is It?: The Unquenchable Thirst of a Water-Hungry World.* Bernadette McDonald and Douglas Jehl, ed. Washington, D.C.: National Geographic Society, 2003. 187-198.

Goheen, Peter G. “The Struggle for Urban Public Space: Disposing of the Toronto Waterfront in the Nineteenth Century.” *Cultural Encounters with the Environment:*

Enduring and Evolving Geographic Themes. Alexander B. Murphy and Douglas L. Johnson, eds. Lanham & Oxford: Rowman & Littlefield, 2000.

Goubert, Jean-Pierre. *The Conquest of Water: The Advent of Health in the Industrial Age.* Trans. Andrew Wilson. Princeton: Princeton University Press, 1989.

Grass, Gunter – Peirre Bourdieu. "The Progressive Restoration: A Franco-German Dialogue." *New Left Review* 14, March/April (2002): 62-77.

Grunsky, Sara. "Privatization tidal wave: IMF/Bank water policies and the price paid by the poor." *Multinational Monitor*, 22.9 (2001).

Habermas, Jurgen. *The Structural Transformation of the Public Sphere: An Inquiry into a category of bourgeois society.* Trans. Thomas Burger. Cambridge, Mass.: MIT Press, 1989.

Hamlin, Christopher. " 'Waters' or 'Water?' - master narratives in water history and their implications for contemporary water policy." *Water Policy* 2.4-5 (2000): 313-325.

Harris, R.C. "The History of the Toronto Waterworks." *Canadian Record and Engineering Review* 19 June 1929: 719-724.

Harrison, Ronald and Paul M. Emery. "Architectural Treatment for Waterworks Structures." *Canadian Municipal Utilities* March (1960): 19-22, 51.

Hawkins, Gay. "Down the Drain: Shit and the Politics of Disturbance." *Culture and Waste: The Creation and Destruction of Value*. Gay Hawkins and Stephen Muecke, eds. Lanham, Maryland: Rowman & Littlefield, 2003.

Hawkins, Gay. "Shit in Public". *Australian Humanities Review* 31-32 (April 2004). www.australianhumanitiesreview.org/archive/Issue-April-2004/hawkins.html

Heritier, Adrienne. "Public-interest services revisited." *Journal of European Public Policy*, 9.6 (2002): 995-1019.

Hilmelfarb, Ellen. "Seahorses lead the charge in a teeming Thames". *Globe and Mail* 19 April 2008. F7.

House Gallery. Mark McGowan - "Running Tap Press". 3 May 2006 http://clublet.com/house?page=RunningTapPress

Howard, Norman J. "Progress of the Year in Water Supply and Purification: A Review of Developments and Trends of 1940". *Water Works & Sewerage*, 88.1(1941): 1-3.

Hume, Christopher. "Analysis Quenching our Thirst for architectural wonder The Palace of Purification; For almost seven decades, Harris Plant has been a monument to civic vision." *Toronto Star* 21 July 2001. B01.

Hume, Christopher. “The more things change, the more they don’t stay the same.” *Toronto Star* 27 January 2007. A3.

Illich, Ivan. *H2O and the Waters of Forgetfulness: Reflections on the Historicity of “Stuff”*. Berkeley: Heyday Books, 1985.

Jasanoff, Sheila and Marybeth Long Martello eds. *Earthly Politics: Local and Global in Environmental Governance*. Cambridge, Mass.: MIT, 2004.

Johnson, Nuala C. “Mapping monuments: the shaping of public space and cultural identities.” *Visual Communication* 1.3 (2002): 293-298.

Johnson, Richard. “What is Cultural Studies anyway?” *Social Text* 16 (1986): 38-80.

Jones, Elwood and Douglas McCalla. “Toronto Waterworks, 1840-77: Continuity and Change in Nineteenth-Century Toronto Politics” *Canadian Historical Review* LX.3 (Sept. 1979): 300-323.

Kaika, Maria. *City of Flows: Modernity, Nature and the City*. New York & London: Routledge, 2005.

Laporte, Dominique. *History of Shit* (1978). Trans. Nadia Benabid and Rodolphe el-Khoury. Cambridge, Mass. & London, England: MIT Press, 2002.

Latour, Bruno. “From Realpolitik to Dingpolitik: or How to Make Things Public.” *Making Things Public: Atmospheres of Democracy.* Eds. Bruno Latour and Peter Weibel. Cambridge, Mass./London, England: The MIT Press, 2005. 14-41.

Le Bourhis, Jean-Pierre. “Water Parliaments: Some Examples”. *Making Things Public: Atmospheres of Democracy*. Eds. Bruno Latour & Peter Weibel. Cambridge, Mass./London, England: The MIT Press, 2005. 482-485.

Ledger, Bronwen. “Art.” *Canadian Architect* September 1988: 6.

Lee, Martyn. “Relocating Location: Cultural Geography, the Specificity of Place and the City Habitus.” *Cultural Methodologies*. Ed. Jim McGuigan. London; Thousand Oaks; New Delhi: Sage Publications. 1997.

Leslie, Jacques. “Running Dry”. *Harpers* July 2000: 37-52.

Loftus, Alexander J. and David A. McDonald. “Of liquid dreams: A political ecology of water privatization in Buenos Aires.” *Environment & Urbanization* 13.2 (2001): 179-99.

“Looking Over Victoria Park Pumping Station – ‘I Dreamt I Dwelt in Marble Halls’.” *Toronto Evening Telegram* 29 July 1938.

Lorinc, John. “The City Builder.” *Spacing* Winter 2006: 16-21.

Luoma, Jon R. “Water for Profit.” *Mother Jones* Nov./Dec. 2002: 34-37, 88.

MacDougall, Heather A. “The Genesis of Public Health Reform in Toronto, 1869-1890.” *Urban History Review* X.3 (Feb. 1982): 1-9.

Maich, Steve. “America is Thirsty”. *Macleans* 28 Dec. 2005: 26-30.

Mann C. Charles. “The Rise of Big Water”. *Vanity Fair* May 2007: 122-130.

Mannell, Steven. “A civic vision for water supply: The Toronto Water Works Extension Project”. *HTO: Toronto’s Water from Lake Iroquois to Lost Rivers to Low-flow Toilets.* Ed. Wayne Reeves & Christina Palassio. Toronto: Coach House Books, 2008. 102-113.

---. “Water Works”. *Canadian Architect* (Jan. 2002): 34.

Market Gallery of the City of Toronto Archives. *The Architecture of Public-Works R.C. Harris Commissioner 1912-1945.* June 30-August 15, 1982.

McCarthy, James and Scott Prudham. “Neoliberal nature and the nature of neoliberalism”. *Geoforum* 35 (2004): 275-283.

McChesney, Robert W. “Media convergence and globalisation”. *Electronic Empires: Global Media and Local Resistance*. Ed. Daya Kishan Thussu. New York: Arnold, 1998. 27-47.

---. “The Political Economy of Global Communication”. *Capitalism and the Information Age: The Political Economy of the Global Communication Revolution*. Eds. Robert W. McChesney, Ellen Meiksins Wood and John Bellamy Foster. New York: Monthly Review Press, 1998. 1-26.

McDonald, David A. and Greg Ruiters, ed. *The Age of Commodity: Water Privatization in Southern Africa.* London; Sterling, VA: Earthscan, 2005.

McEwan, Ian. *Saturday*. Toronto: Knopf Canada, 2005.

Metro Archives. McMahon, Michael, Curator. *Pipe Dreams – the web exhibit (1997)*. 25 September 2007. www.toronto.ca/archives/pipedreams/splash

Middleton, Jesse Edgar. *The Municipality of Toronto: A History (Volume 1)*. Toronto, 1923.

---. *Toronto’s 100 Years*. Toronto: The Centennial Committee, Corporation of The City of Toronto, 1934.

Morris, Dr. Robert D. *The Blue Death: Disease, Disaster, and the Water We Drink*. New York: Harper Collins, 2007.

Mosco,Vincent. *The Political Economy of Communication*. London: SAGE Publications, 1996.

Mugerauer, Robert. "Derrida and Beyond". *Center: A Journal for Architecture in America.* 4 (1988): 66-75.

Murdock, Graham. "Concentration and Ownership in the Era of Privatization". *Media Studies: A Reader*. Ed. Paul Morris and Sue Thornham. New York: New York University Press, 2000. 142-155.

Neimanis, Astrida. "We Are All Bodies of Water." *Water: Alphabet City No. 14*. Ed. John Knechtel. Alphabet City Media & MIT Press: Cambridge, Mass., and London, England, 2009. 82-91.

Ondaatje, Michael. *In the Skin of a Lion*. Toronto: Penguin Books, 1988.

"Open Waterworks Plant In August of Next Year: New Fifteen Million Dollar Project Will Make Water Shortage in Future Impossible." *Toronto Evening Telegram* 26 July 1938.

Petrella, Riccardo. Trans. Patrick Camiller. *The Water Manifesto: Arguments for a World Water Contract*. London; New York: Zed Books, 2001.

Pitts, Gordon. "Another shrimp on China's barbie". *Globe and Mail* 17 Dec. 2005, F3.

Postel, Sandra. *Pillar of Sand: Can the Irrigation Miracle Last?*. New York: W.W. Norton Inc., 1999.

Priscoli, Jerome Dell. "Water and civilization: using history to reframe water policy debates and to build a new ecological realism." *Water Policy* 1.6 (1998): 623-636.

Prudham, Scott. "Poisoning the well: neoliberalism and the contamination of municipal water in Walkerton, Ontario." *Geoforum* 35 (2004): 343-359.

Reeves, Wayne/Metro Works, Metro Planning. *R.C. Harris Filtration Plant: Heritage Inventory and Historical Analysis*. May 1997.

Ridgeway, James. *It's All for Sale: The Control of Global Resources*. Durham; London: Duke University Press, 2004.

Riendeau, Roger, E. “Servicing the modern city 1900-30”. *Forging a Consensus: Historical Essays on Toronto.* Ed. Victor L. Russell. Toronto: University of Toronto Press, 1984. 157-180.

Riley, Britta and Rebecca Bray. *drinkpeedrinkpeedrinkpee* 19 June 2008 www.brittaandrebecca.org/drinkpee/

“Roland C. Harris: Veteran Head of Civic Works Once Office Boy.” Toronto *Globe & Mail* 3 September 1945. 4.

Rose, Carol M. “Economic Claims and the Challenges of New Property”. *Property in Question: Value Transformation in the Global Economy.* Ed. Katherine Verdery and Caroline Humphrey. Oxford & New York: Berg, 2004. 275-295.

Sandals, Leah. “Wet Art” *Spacing* Summer (2007): 44.

Saul, John Ralston. “The Collapse of Globalism and the rebirth of nationalism”. *Harper’s* Mar. 2004: 33-43.

Sennett, Richard. *The Fall of Public Man: On the Social Psychology of Capitalism*. New York: Vintage Books, 1978.

Sheppard, Lola and Mason White. “Water Farming in the American Southwest.” *Water: Alphabet City No. 14*. Ed. John Knechtel. Alphabet City Media & MIT Press: Cambridge, Mass., and London, England, 2009. 280-299.

Shiva, Vandana. *Water Wars: Privatization, Pollution, and Profit*. Toronto: Between the Lines, 2003.

Shove, Elizabeth. *Comfort, Cleanliness and Convenience: The Social Organization of Normality.* Oxford; New York: Berg, 2003.

Shove, Elizabeth. “Converging Conventions of Comfort, Cleanliness and Convenience”. *Journal of Consumer Policy* 26 (2003), 395-418.

Shufelt, Tim. “The water-filtration plant has sprung a leak” *Globe & Mail* 13 October 2007. M3.

Soufoulis, Zoe. “Big Water, Everyday Water: A Sociotechnical Perspective”. *Continuum: Journal of Media and Cultural Studies* 19.4 December (2005), 445-463.

Strang, Veronica. *The Meaning of Water*. Oxford; New York: Berg Publishers, 2004.

Stream of Dreams. 17 Oct. 2007 www.streamofdreams.org.

Swyngedouw, Erik. *Social Power and the Urbanization of Water: Flows of Power*. Oxford: Oxford University Press, 2004.

Thompson, E.P. *Whigs and Hunters: The Origin of the Black Act*. London: Allen Lane, 1975.

Thrift, Nigel and Sarah Whatmore, eds. *Cultural Geography: Critical Concepts in the Social Sciences, Volume 1*. London and New York: Routledge, 2004.

Tilley, S. Leonard. "Waterworks Plant Looms as Showplace." Toronto *Globe & Mail* 26 July 1938. 1.

Tully, Shawn. "Water, Water Everywhere." *Fortune* 15 May 2002.

Villiers, Marq de. *Water: The Fate of Our Most Precious Resource*. Toronto: McClelland & Stewart, 2003.

Ward, Colin. *Reflected in Water: A Crisis in Social Responsibility*. London: Cassell, 1997.

Ward, Diane Raines. *Water Wars*. New York: Riverhead Books, 2002.

"Waste Of Public Money Ald. Wm. Croft Declares of Waterworks "Palace"." Toronto *Evening Telegram* 29 July 1938.

Wood, Chris. "Melting Point: How global warming will melt our glaciers, empty the Great Lakes, force Canada to divert rivers, build dams, and yes, sell water to the United States". *Walrus* Oct. 2005: 43-54.

Yudice, George. *The Expediency of Culture: Uses of Culture in the Global Era*. Durham; London: Duke University Press, 2003.