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Behind the Smoke Screen: A history of Air Pollution in Vancouver from 1880-1960

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*But how different it is with the atmosphere! Upon going suddenly, from the popen pure air, into an impure atmosphere, we may indeed perceive, by some disagreeable odor, that it is not proper to be breathed; but if its impurities have arisen while we have been immersed in it, not only, as had been said, may we be insensible thereto, but the impurity itself may have so operated upon our faculties and sensations, as to have benumbed them, and thus increased the danger. <sup>1</sup>*

*JH Griscom, 1850.*

#### Abstract:

Air pollution is not constructed solely through the physical and natural, rather it is additionally socially constructed through structural, theoretical and emotional human activity/ideology. Through the case of Vancouver in 1880-1960, the study examines three key components of the social construction of air: energy regime changes, municipal regulations and development of environmental thought. Energy regimes are found to influence the social construction of air pollution through innovation, geopolitical relations, supply/demand economy and structures of power. Further, the creation of standardized forms of bureaucracy within the burgeoning city of Vancouver and provision of regulatory power were found to socially construct air pollution. Environmental thought constructed on a desire to cleanse the immediate environment, a desire for moral cleansing and ideological organization further contribute to the construction. I further argue, all the factors in play are interconnected within a mutually reinforcing cycle in which none of the factors can be singled out as the initiating force of the social construction of air pollution, rather they become integrated in a mutually reinforcing feedback cycle of constant re-shaping, re-enforcement and re-imagining.

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<sup>1</sup> J.H. Griscom, *Uses and Abuses of Air: Showing its Influence in Sustaining Life and Producing Disease: With Remarks on the Ventilation of Houses*, Medical Heritage Library & Prudential Insurance Company of America, New York, Redfield, 1850: 6

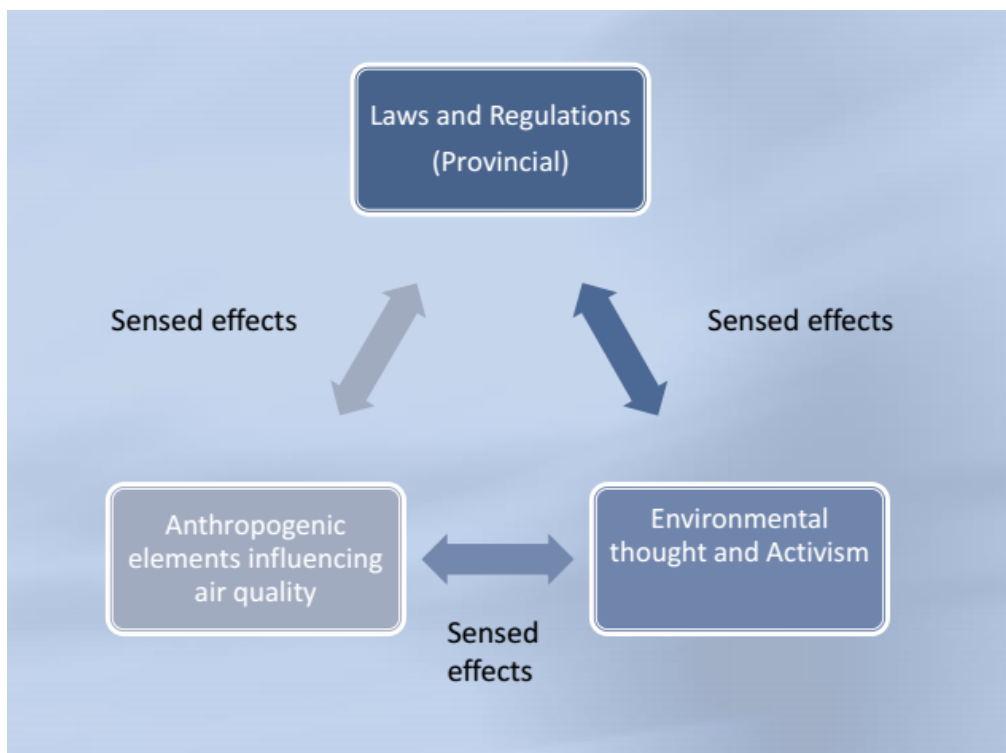
The atmospheric landscape, or “airscape”, is often perceived as a vague physical natural construct characterized by a linear, or sequential, pattern of causality. For example, when a difference between air temperatures occurs, a stable air mass is trapped underneath a warm air mass and water vapour condenses on nuclei to form fog. Defined in mere sequential terms, a construct so mystic becomes demystified. In recent decades both the natural construction of air and anthropogenic influence on the atmosphere have been increasingly studied, particularly guided by improvements in scientific technology and a rise in environmentalism. Yet, air is not constructed solely through the physical, or natural, rather it is further constructed socially through structural, theoretical and emotional human activity and perspectives. In this paper, I will examine manners in which air pollution in Vancouver from 1880-1960 was constructed socially through changes in energy regime, municipal regulation and development of environmental thought (Figure 1). Further, I argue to research the social construction of air it is necessary to consider the factors as integrated within a mutually reinforcing feedback cycle of constant re-shaping, re-enforcement and re-imagining.

The city of Vancouver presents a prime location for a historical exploration of the social construction of air pollution. Founded in 1866, the same period anti-pollution campaigns in the US were on the rise, Vancouver quickly adopted the provision of health related public works and health programmes as a sign of progress.<sup>2</sup> In contrast to more traditional boom towns of the late 19<sup>th</sup> century, economic growth in Vancouver was never tightly bound to a specific non-renewable source, which in turn influenced a less restrictive outlook towards potential facets of pollution. As a growing urban entity without a specific city it sought to emulate, historical

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<sup>2</sup> M.W. Andrews, The Best Advertisement a City Can Have: Public Health Services in Vancouver, 1886-1888, *Urban History Review* 12, 3 (1984): 25

establishments of new forms and patterns of urban governance in Vancouver from 1880-1960 provide unique insight into the social construction of air pollution. Previous research on pollution in Vancouver during the examined period is scarce, with occasional studies examining provision of public and government led encouragement for public health services or examining sewerage and drainage systems.<sup>3</sup> Instead of focusing on a specific factor influencing a form of pollution, my research question opens up a multidimensional field of potential, through which the construct of air pollution can be re-imagined.



*Figure 1. Multidirectional reinforcing cycle of the social construction of air pollution*

Historical research of an intangible airdscape presents a daunting task, as did comprehending the particularities of air pollution at the end of the 19<sup>th</sup> century. While the easily

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<sup>3</sup> M.W. Andrews, *The Best Advertisement a City Can Have*, 1984. ; A.Keeling, *Sink or Swim*, 2004.

sensed and visible problem of water pollution was widely perceived and discussed, the elusive concept of air pollution emerged at a slower pace<sup>4</sup>. The lack of adequate measurements of air pollution in the late 19<sup>th</sup> century created difficulties in constructing and implementing air control regulations, further troubling contemporary historians in assessing the airtape at the time.<sup>5</sup> As a way of anchoring the abstract airtape, my analysis will be grounded within a framework exploring three key components of the social construction of air: energy regime changes, municipal regulations and development of environmental thought. While it is difficult to provide a comprehensive in-depth historical narrative for each component within Vancouver for the examined period, through generalized themes and prominent examples I seek to demonstrate the complex feedback cycle as the main mechanism behind the social construction of air pollution.

The concept of energy regime transition is constructed on the domination of a single energy resource- or group of related resources- within a market during a period or era, which is later replaced by a new energy resource.<sup>6</sup> Energy changes have a profound effect on transport, consumption and production, and practically all economic processes, all heavily reliant on energy.<sup>7</sup> In 1880 North America, including the burgeoning city of Vancouver, the widespread nature and abundance of coal made it the most important energy source well into the 20<sup>th</sup> century, while oil started gaining importance in the years shortly before the First World War.<sup>8</sup> Still, coal remained the primary industrial fuel until the 1950s.<sup>9</sup> The physical geography of British Columbia has facilitated the growth of large coal reserves, including ones in proximity to

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<sup>4</sup> A.W. Rome, *Coming to terms with pollution: The language of environmental reform, 1865- 1915*. *Environmental History* 3, (1996) 18.

<sup>5</sup> E.M.DuPuis, *Smoke and Mirrors: The Politics and Culture of Air Pollution*, New York University Press, New York, 2004: 19.

<sup>6</sup> H. Berg, *Transitions of Energy Regimes: An Evolutionary Economic Interpretation*. Eaul. Verlag. 2013: 8

<sup>7</sup> *Ibid*: 2

<sup>8</sup> *Ibid*:16

<sup>9</sup> H.Berg, *Transitions of Energy Regimes*, 2013: 16

Vancouver and Vancouver Island. With the Hudson's Bay Company beginning coal mining in 1840s to power their steamers, coal became a crucial component of BC industry since colonization.<sup>10</sup> As the Royal Navy became coal-powered, Vancouver Island's reserves became seen as an important strategic asset.<sup>11</sup> Yet, mining and burning of coal is associated with a variety of air quality changes, including increases in smog, acid rain and toxic air. As the industrial potential of coal in comparison to wood was explored, it was not long until the airscape of Vancouver began to change. The sensed change amongst the population of Vancouver, unfortunately, remains largely undocumented and therefore subject to speculation. Still, for example, one would assume the smell of burning wood would appear pleasant in comparison to that of burning coal. Further, in comparison to wood, the nature of coal as a resource made it highly concentrated and prone to high power density, making it easier to be governed by a select few.

With the first gaslights lit in Victoria in 1862, electricity becomes available in Vancouver from a steam plant built at the corner of Pender and Abbott Street.<sup>12</sup> Three decades later, in 1890, Vancouver's first electric streetcar is elected, while the first gasoline car arrives in 1904.<sup>13</sup> As changes in energy regime occur gradually, the preadaptation to the transition from coal to oil became the substitution of kerosene for whale oil in lamps, which became largely popular.<sup>14</sup> With increases in trans-mountain pipelines throughout BC, oil gained popularity due to its easy transportation. Yet, I argue, as transitions between energy regimes are often not as smooth and complete, we therefore cannot observe the historical changes as following a continuous

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<sup>10</sup> A. Ferris, Coal Mining in BC, Energy BC: Coal Mining in British Columbia. Accessed April 1<sup>st</sup>, 2015.

<sup>11</sup> Ibid: Accessed April 1<sup>st</sup>.

<sup>12</sup> Power Pioneers, BC Hydro History: Chronological Overview: 1860-1929. Accessed April 1<sup>st</sup>.

<sup>13</sup> Ibid: Accessed April 1<sup>st</sup>.

<sup>14</sup> H. Berg, Transitions of Energy Regimes, 2013: 16

trajectory of improvement by discovery. For example, despite previous transition to oil as a source, in late December of the 1941, Vancouver oil controller A.S. Morgan urged all but few to switch back from oil to coal as restrictions and anxieties were reinforced in the aftermath of the Japanese bombing of Pearl Harbour earlier in the month, which “increased uncertainty of crude oil supplies.”<sup>15</sup> Similarly, in the following March of 1942, Morgan extended the restrictions due to a sinking of tankers and acute shortage of transportation facilities.<sup>16</sup> The post-war era inspired a re-direction of industrial capability into the automobile industry, which with its exhausts largely influenced a decline in urban air quality. With turmoil around the oil market in following decades, many abandoned their automobiles in search for alternatives. Thus, it is essential to observe changes in energy regimes as a cyclical background reinforcing the social, while being continuously reinforced by the social. Energy regime changes, I argue, influence the social construction of air pollution through innovation and exploration of potential, geopolitical relations, supply/demand economy and structures of power.

To reiterate, smoke of the late 19<sup>th</sup> century, seen as an essential consequence of industrialization, was a direct by-product of soft coal that increasingly substituted the burning of wood. While the odour and smoke of burning wood might have seemed more tolerable than that of coal, studies have found wood to carry a significantly larger amount of carcinogenic material.<sup>17</sup> In turn, while the oil refineries producing energy sources for vehicles further contributed to air pollution, the generation of electrical power in hydroelectric facilities- instead

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<sup>15</sup> City of Vancouver Archives, COV-S27, textual record, Letter by AS Morgan to City of Vancouver, Dec 26<sup>th</sup> 1941, 27-E-6 folder 16.

<sup>16</sup> City of Vancouver Archives, COV-S27, textual record, Letter by AS Morgan to City of Vancouver, Mar 29<sup>th</sup> 1942, 27-E-6 folder 16.

<sup>17</sup> H. Zeediki, Polycyclic aromatic hydrocarbon concentrations in smoke aerosol of domestic stoves burning wood and coal. Eindhoven University of Technology, Dept. Chemical Engineering. 1985: 1

of coal or oil burning installations- further lowered the air pollution levels in Vancouver.<sup>18</sup> Nonetheless, while gas and electricity did contribute largely to the reduction of smoke in the 20<sup>th</sup> century, it was the period between the two World Wars that carried with it the greatest expansion, offsetting the air quality improvement with intensive large-scale building and intensified automobile use.<sup>19</sup>

Pollution problems in Vancouver shattered pre-existing political boundaries and imagined geographies within a few decades from the 1866 formation, while leading to the creation of new structures of urban governance.<sup>20</sup> While the period post-1890 marked a rise in grassroots organizations lobbying for greater governmental urban environment regulation in North America, it was the municipal leaders of Vancouver that were concerned with sanitary preoccupations, regulations and provision of public health services.<sup>21</sup> Still, as the 1912 Canadian Commission of Conservation study revealed Canada had the second-worst rate of typhoid among nine industrial nations, there was a direct move towards larger immediate investment in urban infrastructure, as well as federal anti-pollution legislations.<sup>22</sup> A closer look towards all received smoke inspector applications in Vancouver from 1922-1927 defines a steady progression towards the development of a standardized format of bureaucracy within the growing city.<sup>23</sup> While applications initially arrive in a variety of formats and backgrounds, there is a homogenizing progression towards the 1927 applications, as all now appear in a standardized form –an engineer, with significant experience, with well-known and established references and

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<sup>18</sup> A.D. McIntyre, 2343: Air Pollution Control: A Recommended Program for the Greater Vancouver Regional District, British Columbia Research Council, Vancouver, 1971: 3

<sup>19</sup> A. Marsh, *Smoke: The Problem of Coal and the Atmosphere*, Faber and Faber, London, 1947: 160.

<sup>20</sup> A. Keeling, *Sink or Swim: Water pollution and environmental politics in Vancouver, 1889- 1975*, BC Studies 142/143 (2004): 79

<sup>21</sup> A.W. Rome, *Coming to terms with pollution*, 1996: 7

<sup>22</sup> A. Keeling, *Sink or Swim*, 2004: 86.

<sup>23</sup> City of Vancouver Archives, COV 20, textual records, Smoke Inspector application, 1922. 14-A-2 folder 2; 1924, 14-C-1 folder 3; 1925, 14-C-2 folder 4.; 1926, 14-D-3 folder 4; 1927, 1-D-7 folder 4.



a keen interest in smoke prevention.<sup>24</sup> In effort towards the creation of a sound air pollution regulatory system, the 1923 Smoke Regulation By-law 1603 appointed John Reynolds as inspector for the purposes of carrying out the by-law, while delineating penalties applicable to violators.<sup>25</sup> By-law 1799 in 1926, intended to repeal By-law 1603, approved acts of random inspection of a smoke inspector while on duty, while urging the inspectors to keep detailed records of their inspection.<sup>26</sup> The authority and scope of the smoke inspector as a figure continues to increase throughout the years, visible in the 1948 Chairman letter advocating for more rigid provisions of the smoke bylaw, annual inspections, educational programmes, as well as increase in staff and budget for the smoke inspector office. Hence, creation of standardized forms of bureaucracy and provision of regulatory power become further tools for the social construction of air pollution.

The relationship between Vancouver and US cities in formulation of air pollution control and regulation was, and still is, of extreme importance. In the early years of regulatory change Vancouver relied heavily on imported technical expertise from the US to connect with discourses of pollution in larger North American cities, while legitimizing its status as a prominent counterpart. For example, in 1948, the Smoke Prevention Association of America expressed the desire to render assistance in the formulation of ordinances and regulations in Vancouver.<sup>27</sup> As the association offered its vast wealth of experience and an invitation for enrolment within their organization, one can discern a distinct power dynamic within the letter as the US, with the knowledge, legitimacy and systemic organizations extends a hand toward a Canadian city. The

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<sup>24</sup> City of Vancouver Archives. COV 20. Smoke inspector applications, 1927, 1-D-7 folder 4.

<sup>25</sup> City of Vancouver Archives, COV-S36, textual record, Vancouver City Council: By-law no. 1603: a bylaw for the control and regulation of the production or emission of smoke, 10 Aug. 1923, 29-D-7 folder 54.

<sup>26</sup> City of Vancouver Archives, COV-S36, textual record, Vancouver City Council: By-law no. 1799: a bylaw for the control and regulation of the production or emission of smoke, 10 Aug. 1923, 29-E-3 folder 4.

<sup>27</sup> City of Vancouver Archives, COV-S483, textual record, Smoke Abatement, 1948, 34-D-6 folder 8.

collaboration, thus, serves as a platform for the exchange of knowledge and expression of individual power. In contrast, the 1954 invitation by Pittsburgh to join the Air Pollution Control Association appeals towards the need of all cities to work together in order to combat a growing pollution issue, as the Mayor writes :“No one city can stand alone in this overwhelming activity of air pollution”.

While the highlighted factors of energy regime changes and municipal control of air pollution represent the background and structure of the social construction of air pollution, the development of environmental thought is crucial to keep the cyclical relation between the components active. The development of environmental thought is indicative of prevalent issues and perspective of a period, while both deriving from and further reinforcing energy regime changes and municipal control. Environmental thought, a concept often as elusive as an airtape, is grounded within terminology, attitudes and engagement. The unprecedented air pollution issues arising in late 19<sup>th</sup> century cities were accompanied with a development of a new and complex pollution vocabulary. People initially spoke of “polluted air” in the late 19<sup>th</sup> century to describe contamination of the atmosphere with organic waste, while the word did not acquire its modern meaning until the 1930s<sup>28</sup>. Popularly described as “the smoke nuisance”, or “smoke evil”, “smoke plague” and “smoke problem” the changes in description mimicked the envisioned paths towards a solution- whether through healing, eradication, action or social cleansing.<sup>29</sup> Further, environmental thought differed greatly between different genders, classes and occupations. In a 1996 analysis by Rome, throughout the Civil War to World War I, women were often found to attack air pollution as part of a “municipal housekeeping campaign”, while

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<sup>28</sup> A.W. Rome, *Coming to terms with pollution*, 1996: 6.

<sup>29</sup> *Ibid*: 6.

urging the city to adequately punish industry<sup>30</sup>. On the other hand, engineers and businessmen tended to search for technical solutions, while doctors argued for an ethical cleansing of air and society.<sup>31</sup> Early organizations, thus, focused both on a desire to cleanse the immediate urban environment and a desire for moral cleansing.

As an example of distress with immediate environment, the Capilano Timber Company became involved in a cycle of complaints in 1949. The Vice President of the company, J.A. McLallen, wrote a series of letters as an active way to combat accusations, dissatisfaction and scrutiny against shingle production. In a letter to the Vancouver Daily Province, McLallen advised that future campaigns to stamp out smoke nuisance should be accompanied by a realization that almost all industries will do everything economically possible and reasonable in line with the nature of specific industry.<sup>32</sup> He further finds the city should have a competent engineer visit larger American cities to realize the superior environmental standing of Vancouver, as well as to inquire about equipment that could be applicable to the industry.<sup>33</sup> McLallen's plea for assistance and understanding for a plant he had been operating for 17 years within a district zoned for heavy industry, derives from a series of complaints and petitions against fly ash as a form of air pollution.<sup>34</sup> A collected list of residents proclaimed nuisance, public hazard and destruction of property due to fly ash. In contrast, another petition collected signatures of those who felt unaffected, claiming complaints originated from residents trying to increase their own property value or view.<sup>35</sup> With the smoke inspector responding with a claim the area was quite mildly affected by the ash, it is worth bringing into account the potential

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<sup>30</sup> A.W. Rome, *Coming to terms with pollution*, 1996: 15

<sup>31</sup> A.W. Rome, *Coming to terms with pollution*, 1996: 15; J.H. Griscom, *Uses and Abuses of Air*, 1850.

<sup>32</sup> City of Vancouver Archives, COV-S27, textual record, Fly-ash nuisance and smoke- Capilano Timber Co (2883 McGill Street), Dec 26<sup>th</sup> 1949, 28-E-2 folder 18.

<sup>33</sup> *Ibid.*

<sup>34</sup> *Ibid.*

<sup>35</sup> *Ibid.*

geographies of privilege have in the social construction of air pollution. As noted, the post-war society of Vancouver was characterized by a stronger agency and urgency towards the creation of strong environmental organizations. Primarily, the Vancouver Natural History Society emerged in 1918, with the objective of arousing interest in education, protection and preservation of animals and the natural environment.<sup>36</sup> An exploration of their member list of 1955 and 1960 reveals an increase in the number of members, including a large increase in the number of youth members.<sup>37</sup> Further, the Air Pollution Control Association became incorporated in 1953. The tradition of similar organizations became the future backbone of the prominent and successful environmental action in Vancouver.

In conclusion, the social construction of air pollution does not follow a mere linear pattern of energy regime changes. Rather, energy regime changes, municipal regulation and development of environmental thought continuously reinforce to create a multidirectional chain of re-shaping, re-enforcement and re-imagining. Still, through my research some general patterns reliant on scientific development and ideology were noted. Primarily, from 1880-1960 there is an emerging progression from a sole focus on the unleashing of potential energy regimes, towards a desire for increased monetary, temporal and environmental efficiency. Similarly, Vancouver in this period demonstrates a progression from an unregulated sphere of potential towards an effective, efficient and standardized bureaucracy. Further, a general trend emerges in 1880-1960 Vancouver marking a move from a concern with immediate environment and morality, towards a concern with the larger environment and organized ideology. In a topic as broad as is the history of air in Vancouver, it is never truly possible to adequately cover all aspects of the social or

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<sup>36</sup> J. Peacock and Vancouver Natural History Society. 1993. *The Vancouver natural history society, 1918-1993*. Vancouver: Vancouver Natural History Society: 2.

<sup>37</sup> City of Vancouver Archives, AM1519, Vancouver Natural History Membership, 1958. PAM 1958-131; City of Vancouver Archives, AM1519, Vancouver Natural History Membership, 1958. PAM 1963-78.

physical construction of air pollution. Yet, rather than abstaining from delving into the topic at all for the same reasons, it is crucial to think of each study as a specific interweaving of aspects, stories and perspectives. None of the studies can ever contain all, yet, all together they might start to bring into view the complex story of the history of a structure as fleeting and timeless as air.

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