

## *Froth Flotation and Kimberley, B.C. The Role of Technology in the Transition Between Mining Camp and Community*

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*Throughout the industrial age, the search for mineral resources has led to the creation of many temporary resource extraction settlements, the vast majority of which never become long-term communities. For those who do, there is a critical point at which they transform from a largely single-sex work camp into a community with families and extended social and employment networks. While much research has been done on the growth and development of resource communities, far less has focused on this transitional period, and one aspect in particular has been especially neglected – the role of mining technology. This article examines the invention and application of one extremely influential piece of technology, the differential froth flotation method of ore separation, and its impact on the hard-rock mining communities. Due to this technology's extension of mine lifespan, long-term settlements could be developed around mine sites. In the case of twentieth century North American resource communities, this transition was also aided by research on crime and social trends that suggested advantages to living in smaller urban or suburban centers. This in turn influenced public policy that created a favorable atmosphere for the growth and survival of many small cities that had originated as resource extraction camps. This article examines these various contributing factors by using the example of a particular British Columbia community.*

Histories of resource extraction communities are common in the examination of early Canadian history, as these formed many of the earliest settlements, especially in the rugged West. Most of these have been social histories, focusing on the psychology and demography of these communities through their various phases of existence, from boom and bust cycles to ghost towns to the modern oil patch. What these studies have shared is an assumption of pre-existence; that is, they have taken the community as an existing entity and then examined its stages of life and their effects on residents. Very few studies have looked in detail at the critical transitional phase between a camp as a collection of resource extraction workers and a long-term, stable community that has a self-supporting life beyond that of the resource. This is likely because scientific appraisals of technology and sociology rarely intersect in historical studies. Indeed, most communities can be studied without reference to

technology beyond the obvious transportation analyses.<sup>1</sup> For resource extraction communities, especially mining towns, this is not the case. Since mining communities are deliberately formed entities, created to serve resource needs, their lifespan and development is far more dependent upon technological advances and limitations than urban centers which evolve naturally from the rural conglomerations. Technology drives initial settlement, but more importantly, it allows a mere camp to extend its life into that of a full community that nurtures multiple generations. Therefore, to fully understand the life cycle of this kind of urban space, more attention must be paid to technology beyond transportation, specifically mining technology itself. To demonstrate the intimate relationship between a particular type of community and resource extraction technology, the life cycle of the small Canadian city Kimberley, in south-eastern British Columbia, provides a fine example, not least because it is intimately connected with the birth of an extremely influential mining innovation, differential froth flotation.<sup>2</sup> By examining the founding and evolution of this town, we can combine the history of technology, the study of urban development and the focus on individual contributions that is one of the great strengths of social historiography.

While resource extraction was a common activity in all explored parts of North America at the end of the nineteenth century and the first half of the twentieth, many settlements created were of a temporary frontier or boomtown nature that followed the mines and withered with them. Only when extraction was long-lived and sustainably profitable did it result in a stable community being created around the site of a mine. Differential froth flotation technology developed for the Sullivan mine in Kimberley made this and other hard-rock mines profitable and flexible enough to last decades. This method of ore separation is still in universal use, but remains obscure to social historians. This particular development, however, had a wide ranging impact on the history of settlement and community of all nations engaged in mineral extraction. It has been called “one of the outstanding achievements in 20<sup>th</sup> century technology.”<sup>3</sup> It created the need for a long-term stable workforce rather than itinerant single males. The presence of the mines then created a type of community whose growth and social development were formed by isolation and economics into a socially distinctive entity – the mining town. This type of community, common throughout the world since the nineteenth century, continues to form the attitudes of a large proportion of modern Canadians. Especially now, as the importance of urban spaces to national social and economic health is increasingly studied, and world populations are increasingly urbanized, the motives behind the development of smaller urban communities deserve attention.

The first great mining boom in Canada was low-technology. The early 1860s Cariboo gold rush relied mainly on panning and pick-work, and the resulting temporary settlements consisted largely of adventurous single men from the United States.<sup>4</sup> Most of the boom towns created through this influx of hopeful individuals had faded by the 1870s, as miners moved on to newer claims, or changed occupations and settled in ranching and farming areas of the interior.<sup>5</sup> The profits from that boom,

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<sup>1</sup>I refer here primarily to the railroad, and its well-documented effects on settlement in Western North America. There is much intersection in this area between Canadian and American studies. See particularly E.P. Alexander, *Iron Horses: American Locomotives, 1829-1900*, New York: W.W. Norton, 1941; Walter Licht, *Industrializing America: The Nineteenth Century*, Baltimore: Johns Hopkins University Press, 1995.

<sup>2</sup>This region is now commonly referred to as the Kootenays.

<sup>3</sup>Maurice Fuerstenau, Graeme J. Jameson and Roe-Hoan Yoon, *Froth Flotation: A Century of Innovation*, (Littleton, Colorado: Society for Mining, Metallurgy and Exploration, 2007), 68.

<sup>4</sup>Irene Stangoe, *Cariboo-Chilcotin: Pioneer People and Places*, (Surrey, B.C.: Heritage House, 1994), 44. The first group of miners exploring B.C. interior overland came in 1858, and the strike that started the Cariboo rush came at the community they named Horsefly in 1859. Vancouver Island is a separate case, explored as early as 1850. For a detailed examination of Vancouver Island's early resource extraction, and the issues of such towns and workers, see John Douglas Belshaw, *Colonization and Community: The Vancouver Island Coalfield and the Making of the British Columbian Working Class*, (Montreal and Kingston: Queen's University Press, 2002.)

<sup>5</sup>While the most well known of these faded boom towns is Barkerville, earlier the town of Quesnel Forks was the largest town in the B.C. interior in the early 1860s. When the Cariboo Wagon Road to Barkerville was built in 1865, it bypassed Quesnel Forks and doomed the town. The Cariboo region is in the southern interior, stretching up towards the central interior. The major obstacle to travelers was the Fraser Canyon, but this area was still more accessible than parts of BC like the Kootenays, which were protected by

however, encouraged further exploration of Canada's West, and a happy coincidence of timing led to the opening of even more rugged sections of British Columbia to mining. In the 1870s and 1880s the United States experienced their own mining boom that made skilled men, capital and equipment available for import to British Columbia.<sup>6</sup> This spurred exploration of, among other areas, the Cascade and Selkirk mountain ranges in the 1890s. These mountains are characterized by sharp elevation and climate changes, unsuitable for most types of farming, difficult for road building, and generally less hospitable than the lush valleys and plains of other regions of British Columbia. Exploration of their wealth was confined almost exclusively to mineral-seekers.<sup>7</sup> In 1892 Pat Sullivan and his three partners claimed a mountainside in the East Kootenays. When Sullivan registered the three claims required, his love of Shakespeare led him to name two of them the Hamlet and the Shylock, the origin of this naming tradition in the BC interior.<sup>8</sup> When Sullivan died during another expedition the next year, his partners named the largest claim for him. When Mark Ridpath bought the claim for twenty-four thousand dollars in 1896, he hoped it would prove as rich as the famous Kimberley mines in South Africa, so he painted the name "Kimberley Camp" on a plank and nailed it to a tree next to his tent.<sup>9</sup> Originally a lead, zinc and silver mine, the Sullivan site shipped its ore to the existing Trail smelter, boosting the profile of Trail and spurring its growth.<sup>10</sup> Shipments moved on mule-drawn wagons over an extremely rough road. In 1902, to reduce transport costs, a smelter was built near the Kimberley site, in what became the town of Marysville. At this point Kimberley, like many towns in the Kootenays, was still a rough camp, with primitive dirt roads linking mine and smelter to the camp site. When the Sullivan mine proved a rich deposit, dormitory-style company housing was created, and some few managers built cabins and brought their women and children for visits.<sup>11</sup> This was, however, very much a frontier community, similar to boomtowns across the interior. A hotel opened in 1898 to serve the predominantly "roughneck" community, and ran twenty-four hours with gambling and fighting the main activities.<sup>12</sup> The CPR spur that had linked Kimberley to Cranbrook in 1901 was strictly a supply route for the mine. Ironically, while railroads drove urbanization in general, they were a major factor in ensuring that resource towns remained small single-industry urban areas largely exempt from that overall trend of upward urban growth. The fact that they allowed factories using mineral resources to be located far from the mines themselves meant there was no impetus and no necessity to create a

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multiple ranges. Even towns which eventually came to form major settlements in the Cariboo, like Williams Lake, owed their resurgence to later factors unrelated to mining, like the cattle boom. Few miners became rich, so most equipped themselves with other occupations like ranching if they wished to stay in B.C.

6 JRW, *Mining in BC: 1830 – 1930*. British Columbia Provincial Museum Modern History Exhibits. This boom demonstrated the profitability of more than just gold, leading to searches for more varied minerals, including copper, lead and silver, which were what initially attracted men to the Cascade and Selkirk ranges.

7 Fred Beckey, *Range of Glaciers: The Exploration and Survey of the Northern Cascade Range*, (Portland: Oregon Historical Society Press, 2003), 27 - 57. Beckey gives a detailed description of the hardships faced in exploration, making it clear why farmers sought easier areas. For a description of a typical migration from California to the BC interior, including road conditions and time of travel, see Todd and Eldon Lee, *From California to North 52°: Cariboo Experiences*, (Prince George, BC: Caitlin Press, 1994), 5-8.

8 Donald Malcolm Wilson, *Virtual Crowsnest Highway: Southwestern Canada's Information Resource*, accessed Sept 15, 2008 at <http://www.crowsnest-highway.ca/cgi-bin/citypage.pl?city=kimberley>. This website combines previously published material with the work of numerous amateur and professional historians of the area, crosschecks data before publishing, and provides references for outside sources. It is a good starting point for research on individual towns, as well as a source of personal histories. Another source of Kimberley timeline and population information is Kimberley Newslite, a Cominco publication from the Kimberley operation, especially the July 1996 issue, "Kimberley: 100 Years."

9 Various, *Salute to Kimberley: 1890 – 1999*, pamphlet by The Kimberley Daily Bulletin, accessed Oct 8, 2008 at <http://www.electricscotland.net/canada/history.htm>

10 Trail served numerous smaller mines in the area, but ore from the Sullivan was the largest contributor to Trail's prosperity, and determined the industrial character of the town, which persists today. As Trail's former plant spokesman Richard Fish says, "In the industry, people talk about the 'mine that makes the company.' Well, Sullivan made Cominco." Unaccredited interviewer, undated article available on BCTVKootenays web site at <http://www.angelfire.com/film/tmtv/metal.htm>.

11 The Kimberley Daily Bulletin archives show the earliest record of children in Kimberley as Edwin Cleghorn Smith's stepchildren Harry and Mary Mott, pictured in front of his rough cabin directly next to the mine site around 1898. Women were reluctant to travel to such primitive camps, due to concerns for their (and their children's) physical and moral well-being, so most wives saw their husbands rarely. For an illustration of life in a newly formed mining community in the Kootenays, as well as the difficulty of travel see the story by Brenda Hornby, "Vignette: Life in the Town of Nelson, British Columbia," in *Framing our Past: Canadian Women's History in the Twentieth Century*, Sharon Anne Cook, Lorna R. McLean and Kate O'Rourke eds. (Montreal: McGill-Queen's University Press, 2001), 15 – 18.

12 Wilson, *Virtual Crowsnest Highway*.

larger diversified economy around the factories, schools and markets. The isolated camp of Kimberley had only thirty-five men employed at this time, and over the next decade economic difficulties nearly demolished the Sullivan and its satellite communities.

By 1900, the worldwide mining boom had ended, and mining employment dropped thirty percent.<sup>13</sup> This meant that all mines had to be evaluated for their future potential, and thousands were sold cheaply under threat of closure. Consolidated Mining and Smelting Company, known today as Cominco, estimated that the Sullivan would give a few more years of service, and bought the mine. The advent of World War I saved it and many Canadian mines by briefly making lead and zinc extremely valuable. The United States was reluctant to damage its initial neutrality by supplying zinc to Canada's munitions plants, so Ottawa poured money into company coffers to protect national supplies. When peace seemed imminent, that money was no longer forthcoming, and mines like the Sullivan were in danger of being decommissioned with the tanks. CM&S hired a foreign consultant to address the worldwide problem of efficiency in ore separation. Without a solution to this problem, the lifespan of the Sullivan and similar mines would be measured in years rather than decades, and would never endure long enough to bequeath the character of a mining town to any subsequent community.

A method of cheaply separating minerals from useless rock was a major field of study throughout the mining world. One of the scientists working on the problem was Ralph W. Diamond. A graduate of the University of Toronto in 1913, Diamond had worked at Broken Hill, Australia and Butte, Montana under scientists struggling to make ore separation cheaper and more versatile. In 1917 Diamond was hired by CM&S, came to Trail and began examining the Sullivan ore. The unique nature of this ore, with tantalizing amounts of zinc, but correspondingly problematic levels of iron sulphides, was a particular challenge. Diamond suspected, as did others, that the solution had already been envisioned decades earlier by a rare female geologist, Carrie Billings Everson. In 1886 she had patented a flotation method of sulphide separation using oil and acid, agitated to create a scummy froth that floated minerals on the surface of water due to entrained air.<sup>14</sup> This seemingly simple idea forms the basis of ore separation technology to this day, and Everson was acknowledged by later historians as "a quarter of a century in advance of her profession."<sup>15</sup> However, just as the critical transition period between camp and town has been neglected in traditional histories, and the social ramifications of her innovation have been neglected, Everson herself sank into obscurity. In this case, her neglect by a majority of historians seems to be due to a combination of luck and gender.

With the rise of gender studies and recognition of systemic inequalities in social, legal and economic systems, scholars have recently re-examined the long-held notion that female inventors were a rarity. In the United States, during the so-called Golden Age of Invention, 1865-1900, Deborah Merritt asserts that "social, legal, and administrative obstacles prevented women from competing fairly for patents."<sup>16</sup> For example, she finds that "the Patent Office administered the [patent] statute in a manner that disadvantaged female applicants."<sup>17</sup> Even as late as 1923 the Women's Bureau lamented that "the creative spirit flourishes in an atmosphere of friendly faith and languishes when envired by indifference, unbelief, or hostility."<sup>18</sup> Exclusion from the business world deprived female inventors of the business acumen needed to develop and market inventions.<sup>19</sup> Also, there were numerous unscrupulous attorneys misrepresenting patent clients in order to take profits for themselves, and female inventors were particular targets for such predators.<sup>20</sup> A veteran of the chemical industry and

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13 Fuerstenau, Jameson and Yoon, 66.

14 Fuerstenau, Jameson and Yoon, 68. Essentially, minerals of different densities will float when frothed with fats and acids in a liquid bath.

15 Fuerstenau, Jameson and Yoon, 68.

16 Deborah J. Merritt, "Hypatia in the Patent Office: Women Inventors and the Law, 1865-1900," *The American Journal of Legal History*, Vol. 35, No. 3 (Jul., 1991), 237.

17 Merritt, 237, 289-293, 299-303.

18 Merritt, 296. A general lack of social recognition for female inventors hindered women's abilities to devote the needed time and money to developing their ideas.

19 Merritt, 299.

20 Merritt, 299.

business world who had worked with Everson told *The New York Times* in 1916 that problems with the men in her test plant had thwarted Everson's desires to market the flotation process on a large scale, as later companies were to do so successfully.<sup>21</sup> There was no belief in the economic community at the time that such a revolutionary idea by a female inventor was worth the risk.<sup>22</sup> Even when flotation was recognized much later, gender bias led to her very abilities being called into question by the scientific community.

Froth flotation was being attempted by scientists in New Zealand, Australia and the United States by the late 1890s. When demonstrations by these groups were successful in 1915, the scientific community 'rediscovered' Everson's work.<sup>23</sup> The 1931 International Convention of the Electrochemical Society held a symposium on the flotation process, saying it was "invented by Miss Carrie J. Everson," and that its introduction had "completely revolutionized mining and metallurgy within the last ten years."<sup>24</sup> Shortly after this her second and deeper descent into obscurity began, and the impetus behind it seems to be her gender and lack of a recognized professional designation. Although she is credited, and was at the time, with rigorous scientific method and broad knowledge of geology and chemistry, she was not a member of an officially recognized research group and lacked traditional credentials.<sup>25</sup> Rumours had been spreading since her first patent was filed that she had either stolen a male relative's ideas or, more perniciously, that she had simply stumbled upon the idea while washing the sample bags of male geologists.<sup>26</sup> The patronizing and dismissive laundry story has proven the most difficult one to shake, and the most damning to Everson's reputation. The critical repetition of this tale appears to be in Thomas A. Rickard's 1932 *History of American Mining*, which totally discounts her contribution to the flotation process.<sup>27</sup> This history formed the basis of an influential modern account, that of generally well-regarded historian Otis E. Young, Jr.<sup>28</sup> He considers that Rickard had "disposed of" Everson's work adequately, and further states "Miss Everson must be relegated to that apocryphal sorority...who by one means or another supposedly influenced the menfolk to influence American history."<sup>29</sup> Variations of this appear in nearly all of those few articles and books

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21 Ellwood Hendrick is quoted in "Why We Need Chemistry in Our American Industries," *New York Times*, September 24, 1916. He says Everson made partners of the men in her test plant, and in fact her second patent was held in partnership with a man, which would have made sense due to the difficulties women, especially married women, faced in the economic dealings of the day, see Merritt. That second patent was for the demonstration plant and mechanical process, which functioned exactly as it was supposed to, but Everson was unable to secure funding for a large-scale facility. When her husband died two years later, she was forced to abandon research and support her family by nursing.

22 Some engineers blame the revolutionary nature of the development for its early failure. For example, Theodore Jesse Hoover, *The Economics of Mining (Non-Ferrous Metals) Valuation - Organization - Management*, (Stanford University Press, 1933) argues that the "real reason for its lack of commercial application was its startling departure from previous known methods."

23 Attempts were made to locate Everson. Unfortunately, she had died the previous year. Over the next two decades, as flotation was perfected and put into worldwide practice, Everson enjoyed a brief posthumous recognition, although she remained unknown outside technical circles.

24 "International Convention of the Electrochemical Society," *Science*, New Series, Vol. 74, No. 1914 (Sep. 4, 1931), 237.

25 This was not unusual for male inventors of the day either, but this fed the early rumours about Everson, especially since she had family connections to the mining industry. Everson was initially drawn to study mining technology when her family lost money in a poor mining investment, and her brother was an assayer.

26 These tales are not credible. First, her experimental process was well-documented. Second, her husband had no chemical aptitude, and her brother was not involved in her process at all. The second patent she filed, which was jointly held with a male, involved the mechanical process, not the initial conceptual work. Third, her process involved fats and acids that would not naturally have been used in the doing of laundry. Most historians, including Fuerstenau et al, believe that this was a way of trivializing Everson in a manner that would have been credible at the time, due to stereotypes about women's traditional roles.

27 Thomas A. Rickard, *History of American Mining*, (New York: McGraw-Hill, 1932), 397. Rickard was a mining engineer himself. He referred to the laundry tale as a myth, but ignored the patent Everson had registered as testimony to her work, preferring to focus on the first large-scale demonstrations of the technology that came much later, and by more typical examples of mining researchers.

28 Otis E. Young Jr., *Western Mining: An Informal Account of Precious-Metals Prospecting, Placing, Lode Mining and Milling on the American Frontier from Spanish Times to 1893*, (Norman, Oklahoma: University of Oklahoma Press, 1970.)

29 Young, 232. Young takes Rickard's work on Everson at face value, despite warning readers in his bibliography that Rickard "contains a few small errors of historical fact against which the student should be on guard."

that mention Everson *after* 1932.<sup>30</sup> This is despite the fact that there were reputable and more truthful sources extant in the public record from at least 1916.<sup>31</sup> What makes her obscurity so unjust is the tremendous influence flotation technology had on settlement patterns throughout the twentieth century, once its full potential was realized. Fortunately for Kimberley, it was.

Everson's ideas were resurrected by large companies struggling to cheaply refine zinc. There were a number of teams attacking the problem; the Mellon Institute of Industrial Relations in Pittsburgh had a fellowship studying flotation, based on Carrie Everson's process.<sup>32</sup> At the Sullivan mine, the ore-rock mixture made flotation the only economic option. However, since flotation required small particles, only in wartime could the laborious hand sorting and crushing of rock to extract a single mineral be maintained. Fortunately, by 1918, Diamond had developed a three stage differential flotation system that worked by floating and isolating minerals of different specific gravities in each chamber.<sup>33</sup> A 1918 report on his process said it made the Sullivan "one of the most valuable mineral deposits in America if not the whole world."<sup>34</sup> It was estimated the mine would now last for fifty years, although in fact it lasted more than eighty. This meant a long-term stable work force was needed, and the company set about attracting and housing them. By 1925 there were more than three thousand inhabitants of Kimberley enjoying family-style housing, railroad and highway transportation, churches and schools.<sup>35</sup> The network of mining communities that had formed very rapidly in the Kootenays before the First World War enjoyed a similar population boost.<sup>36</sup> The benefit of this technology, however, stretched far beyond this locale and decade, to influence the creation of communities across the continent, even the world. The main reason for this impact was the flexibility of the process.

The acid reagents and oils used to float minerals could be adjusted to refine nearly any mineral, and mines everywhere imitated what became known as the Diamond process. In the US, this led to massive production of cheap copper, which is in turn credited with the widespread distribution of electricity for home use.<sup>37</sup> As world commodity prices varied, the Diamond Concentrator was applied to many desirable elements. For example, the concentrator at Sullivan was modified at various times to

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30 Merritt's article, while entirely sympathetic to the difficulties faced by female inventors in the nineteenth century, still uncritically lists Everson as a "schoolteacher" rather than a scientist, and says she made her discovery "while helping her brother wash out soiled ore sacks." (268) Fortunately, recent scholarship in social sciences and mining history has resurrected her image. See Fuerstenau et al.; Jeremy Mouat, "The Development of the Flotation Process: Technological Change and the Genesis of Modern Mining, 1989-1911," *Australian Economic History Review* 36:1, March 1996, 4. Mouat calls Everson's version "one of the most significant advances ever made in ore treatment." Sally Zanjani's *A Mine of Her Own: Women Prospectors in the American West, 1850-1950*, Lincoln, Nebraska: University of Nebraska Press, 1997, 104-5 credits laboratory skill and persistence for Everson's discovery. The most comprehensive treatment of Everson is Dawn Bunyak, "Life and Times of Carrie Everson: an Inventive Woman Lost in a Man's World," Thesis for University of Colorado at Denver, 2003, available online at <http://worldcat.org/oclc/54513882>. Also see Bunyak's in-depth examination of the flotation process itself in "Frothers, Bubbles and Flotation: A Survey of Flotation Milling in the Twentieth Century Milling Industry," a report for the National Park Service, Denver, Colorado, 22-33, available online at [http://www.nps.gov/history/history/online\\_books/npsg/milling.pdf](http://www.nps.gov/history/history/online_books/npsg/milling.pdf)

31 Her son John L. or 'Jack' Everson's biographical sketch appeared in January of 1916, as did a cover article for *The Engineering and Mining Journal*. *The Mining American* January 15, 1916, pp. 8-9, "Carrie Jane Everson, Inventor", written by John L. Everson; *The Engineering & Mining Journal* January 15, 1916, vol. 101, No.3 This article appears to be the first occurrence of the phrase used later by Fuerstenau et al, that Everson was "a quarter century in advance of her profession."

The preceding sources are linked on the Carrie Everson web site for *Die Personed Encyclopedie* at <http://www.personencyclopedia.info/E/Ev/EVERSONRebeccaCarrieJane%20Billings>

32 Unknown, "Why We Need Chemistry in Our American Industries," *New York Times*. September 24, 1916.

33 The basic principle is the same as Everson's. Ore is crushed finely and fed through a series of chambers, each with a different solution inside. When agitated until a froth is formed, the different relative densities of target minerals allow them to be isolated. Bubbles cling to some constituents of the ore and float them to the surface of the tank, and others sink to the bottom and can be recovered that way.

34 Fuerstenau, Jameson and Yoon, 74.

35 Various, *Salute to Kimberley: 1890 - 1999*.

36 John Douglas Belshaw, *Becoming British Columbia: a Population History*. Vancouver: UBC Press 2009.45 discusses the pre-war growth in BC's population, which was not due to Vancouver alone, but also to tremendous growth in the mining districts in Vancouver Island and the Kootenays. With mine longevity assured, these boom towns remained strong and grew in the post-flotation period, defying the previous patterns of mine communities. This book follows population trends throughout the century, and is an extremely complete and usable collection of fertility and migration data on BC.

37 Fuerstenau, Jameson and Yoon, 65.

produce cadmium, bismuth, iron, lead and copper for various industrial uses.<sup>38</sup> Later it harnessed the by-products of the concentrator and produced ammonium phosphate fertilizer and sulphuric acid. What this meant is that Kimberley did not suffer the fate of the Canadian and Californian gold rush towns, which boomed and became ghost towns within the space of a few years as the single element that made the mines valuable was depleted.<sup>39</sup> In such a one industry town, market demand for the product of the mines is not the only factor in determining the success of the mine, rather the profitability of the entire process determines the desirability of a particular ore. Just as oil from the sands of Northern Alberta is costly to extract, and thus attractive only when world oil prices remain high, a silver mine could not survive when falling world silver prices reduce the profit margin of the ore extraction process. In consequence a shift in world price of one commodity could spell the death of a many a mining community. What froth flotation enabled is not only a more efficient extraction of a single ore, making any mine more profitable and allowing the use of less pure ore, it meant that even when the entire market for a mine's main mineral disappeared, the mine could be retooled to extract minerals for a different market altogether, just as the Sullivan mine repeatedly was. Here, women joined their husbands permanently, raising children and finding employment themselves, often as nurses and teachers, as a stable community was formed.<sup>40</sup> Generations were born near and worked in the mines. A frontier work camp in land unsuitable for farming, isolated from urban centers, developed into a resource-dependent, one industry town. The critical part it played in the transitional phase between camp and community forms another legacy of the froth flotation system, a social legacy. Although the study of small urban formations is still at an early stage, recent research suggests that this legacy may reach far beyond Canada's borders.

Resource extraction towns are different from other towns; the isolation and the type of work create distinctive communities. Historians and anthropologists studying the effects of mining across the world have found that a mining community in Southern British Columbia may have more in common with a mining town in South America, Northern Ireland or South Africa than it has with a nearby urban community, even those that are themselves small or medium-sized. Chris Southcott recognised these distinctions when he proposed that anthropologists divide the traditional urban versus rural dichotomy used to examine cultural differences into six region types to account for, among other classifications, resource-based communities.<sup>41</sup> They share some distinct characteristics. First of all, the mining town is set apart on the basis of its total lack of organic growth pattern. Rather than a gradual agglomeration of settlers at a convenient rural location, that slowly accumulates individuals of different occupations, and finally becomes large enough to allow service occupations to flourish, mining towns are manufactured, invented with a specific purpose. They are what John Belshaw has termed "urban formations without a rural past."<sup>42</sup> These communities share certain social characteristics dictated by the working and living conditions. United Nations researchers recognized the commonalities as early as 1953, when they reported fertility rates were higher than in other rural or urban settings, due partly to low levels of female labour-force participation, low child-raising costs, and early marriage for women.<sup>43</sup> The UN Economic Commission for Africa made similar findings in its 2005 report on

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38 Wilson, *Virtual Crowsnest Highway*. At one point, even the crushed rock was turned to profit as railbed material.

39 Douglas Fetherling, *The Gold Crusades: A Social History of Gold Rushes 1849 – 1929*, (Toronto: Macmillan, 1988), 149 - 179.

40The CM&S company sponsored the construction of Kimberley's schools and hospitals (1924) which provided the earliest employment for women outside the hotels or company stores. It also sponsored other trappings of community life like a community hall and theatre, a public skating rink and a hockey team, which was initially composed entirely of miners.

41 Juteau, Danielle, "Patterns of Social Differentiation in Canada: Understanding Their Dynamics and Bridging the Gaps," supplement to *Canadian Public Policy*, 26(2000): S98.

42 John Douglas Belshaw, "Rurality Check: Demographic Boundaries on the British Columbia Frontier," in *Beyond the City Limits: Rural History in British Columbia*, R.W. Sandwell editor, (UBC Press, Vancouver: 1999), 194-211. Belshaw describes the preponderance of such towns "without the preliminary of an agrarian, pre-urban phase" in BC, and attributes it not just to the terrain, but to the demands of resource-extraction industries.

43 Ricardo Godoy, "Mining: Anthropological Perspectives," *Annual Review of Anthropology*, 14(1995): 205. See also Belshaw, *Becoming British Columbia*, 187-194, where BC's preponderance of resource towns is a major factor in its tendency to inhabit "the extremes of Western world demographic trends."

sustainable development in Africa.<sup>44</sup> Women and young people are more likely to work at part time or casual labour if at all. Mining towns are characterized by “simplified occupational structures and relatively high levels of community instability.”<sup>45</sup> They are also usually in remote areas with little opportunity to diversify, so mature mining communities have had to face “reduced employment resulting from increased mechanization and automation or declining commodity prices.”<sup>46</sup> The accompanying tendency for the employment of youth to be in marginal forms of mining-dependent activity has led to high out-migration of young people. The dominance of the mining company in the community also bestows a specific and hierarchical physical structure, and a unique relationship to the environment.

Once a new mine was evaluated, the first dwellings were placed in walking distance for convenience, and further settlements followed this initial pattern, moving further away as transport technology allowed.<sup>47</sup> This pattern is distinctly present in Kimberley, with the various decades of development appearing on successive levels gradually moving downwards from the mine, rather than traditional valley development that moves upwards from the fertile lowlands.<sup>48</sup> The first dwellings were located directly adjacent to the pit itself. Because buildings were planned by the company and were “subservient to economic interest,” mining towns were not laid out for aesthetic appeal.<sup>49</sup> The industrial and railroad buildings had the best land, housing was secondary. Houses were built in uniform rows, with size and location depending on the intended recipient. The superintendent received the best and largest house, usually on a prominent vantage point, and they descended in size and quality from there. Of course the mine itself dominates the landscape of the town, both mentally and physically. As Thomas Dunlap argues, “the creation and destruction of landscapes on the ground and in our minds is central to our history.”<sup>50</sup> The rapid destruction of the natural environment that accompanied the growth of a mine, and the fact that this destruction directly provided prosperity to settlers, encouraged them to think of the landscape as subordinate to their needs, and connected its continuing alteration with ever-increasing benefit for man.<sup>51</sup> This attitude resonates in resource culture today, in its conflicts with environmentalism. Much of the conflict stems from the idea that resource towns are tied to an older-style capitalist economy, and therefore do not share the modern values of

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44 “Sustainable Development Report on Africa: Managing Land-Based Resources for Sustainable Development,” Report to the United Nations Economic Commission for Africa, 2005, available online in multiple formats. For highlights, see [http://www.uneca.org/csd/CSD4\\_Managing\\_Land\\_based\\_resoruces\\_for\\_Sust\\_Devt\\_Highlights.htm](http://www.uneca.org/csd/CSD4_Managing_Land_based_resoruces_for_Sust_Devt_Highlights.htm). Africa is particularly vulnerable to the problems of extractive industries and communities since that category of industry accounted for more than 50 per cent of Africa’s export in the 1990s, and still is the largest export category of the continent. For more discussion of the African resource communities and industry, see proceedings from the United Nations Conference on Environment and Development (1992) and the World Summit for Sustainable Development (WSSD) in 2002.

For South American studies, see “Mining and Social Movements: Struggles Over Livelihood and Rural Territorial Development in the Andes,” Anthony Bebbington, Denise Humphreys Bebbington, Jeffrey Bury, Jeannet Langan, Juan Pablo Muñoz and Martin Scurrah, *World Development* 36, December 2008, Pages 2888-2905.

South America has recently greatly increased its investment and dependency on oil exploration and export, partly due to the possibility of swift economic prosperity, as held out by the model of Ecuador, which took only a decade to transform the entire national economy.

Note: Africa and South America have recently taken steps to form unprecedented cooperation between the two regions in recognition of the common interests in the energy and extractive sectors. See report from First Africa–South America (ASA) Joint Conference Of Ministers In Charge Of Energy, AU Headquarters, Addis Ababa, Ethiopia 13-17 July 2009, available online at [http://www.africa-union.org/root/AU/Conferences/2009/july/IE/docs/Energy\\_Projects\\_en.doc](http://www.africa-union.org/root/AU/Conferences/2009/july/IE/docs/Energy_Projects_en.doc).

A good source of extractive industry articles and press releases is found on the World Bank Information Center web site, English version <http://www.bicusa.org/en/Article.11407.aspx>.

45 Lois D. Etherington and Lawrence T. Pinfield, “Housing Strategies of Resource Firms in Western Canada,” *Canadian Public Policy*, 11(1985): 94.

46 Marcello M. Veigia, Malcolm Scoble and Mary Louise McAllister, “Mining With Communities,” *Natural Resources Forum*. 25(2001): 192.

47 Arnold R. Alanen, “Documenting the Physical and Social Characteristics of Mining and Resource-Based Communities,” *Bulletin of the Association for Preservation Technology*, 11(1979): 51.

48 Striking pictures of the early and growing towns can be found on the Columbia Basin Institute web site at <http://www.basininstitute.org/home/main/index.html>. See particularly archive photographs 0205.004, 0205.0010, 0203.0024, 0203.0047.

49 Alanen, 53.

50 Thomas R. Dunlap, “Creation and Destruction of Landscapes of Empire,” in *City, Country, Empire: Landscapes in Environmental History*, Jeffrey M. Diefendorf and Kurk Dorsey eds., (Pittsburgh: University of Pittsburgh Press, 2005), 207.

51 Dunlap, 207-225.



their diversified neighbouring towns or regions. Raymond Rasker noted in his study of Northwestern United States areas that self-identified as resource extraction regions that there were many “myths” about the industry; one of the primary ones was that “promotion of the extractive sectors is often deemed to be necessary and desirable, because [those assets are] all that rural communities have available to them.”<sup>52</sup> This leads to a community being “at the mercy of economic forces outside its control.”<sup>53</sup> Kirk Louis Johnson went further, alleging that Northwest rural communities had come to resemble “developing countries” in their lack of value added industry and tendency to funnel resource profit to outside investors.<sup>54</sup> It is only recently that leading mining companies even acknowledged that mining might be detrimental to residents, as an “inherently dangerous, destructive and pollutive” activity.<sup>55</sup> The people in mining towns have long known that they had a physical legacy from the mine that was located by design so close to their dwellings. While the early years of mining and refining meant a great deal of pollution, even today there are the less tangible, harder to quantify “shadow effects” of “noise, dust, run-off, seepage, and vibration.”<sup>56</sup> Recent work on environmental health of communities refers to both “groundwater contamination” and “acid dust clouds” as commonly expressed concerns by residents of towns near mine sites.<sup>57</sup> Dependence on the mine, and the common effects it had on lives and psyches, may also explain some of the positive aspects of community life. That there are positive aspects cannot be doubted, as more than money continued to attract settlers, and made citizens fight to keep these towns alive even after the mine had died.

While the mining company enforced hierarchy, on a community level these towns fit the thesis of Sean Wilentz that in “single industry cities and mining towns, divisions between workers and the independent middle class tend to be less sharp than in larger cities.”<sup>58</sup> Historians have speculated that the dangerous work, low pay, and isolation underwrote “the formation of intense forms of worker solidarity and radical labour movements as well as the growth of forms of political consciousness,” that have been found in areas founded and populated by mining.<sup>59</sup> There is a strong history of worker and class solidarity in mining towns, manifested in unions and activism. Many of the most famous and important labour disputes of the twentieth century originated in mining communities, such as the anthracite coal miners’ strike of 1902 in eastern Pennsylvania, or the copper strike in 1917 that led to the deportation of a thousand miners from Arizona.<sup>60</sup> Kimberley and its related communities were not untouched by labour activism. The Sullivan Mine went on strike in 1919 and even earlier CM&S had a brush with one of Canadian labour’s most famous figures, ‘Ginger’ Goodwin, when the Trail

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52 Chuck Harris, “Rural Communities In The Inland Northwest: Characteristics Of Small Towns In The Interior And Upper Columbia River Basins,” Report to the Interior Columbia River Basin Ecosystem Management Project U.S. Forest Service and Bureau of Land Management. Raymond Rasker called it a myth because a large number of these previously resource-only towns have switched to tourism or retail industries as the primary economic driver.

23. This reference is to Raymond Rasker, “Rural Development, Conservation, And Public Policy in the Greater Yellowstone Ecosystem,” *Society and Natural Resources* 6:1993, 109–126. Conclusions from Rasker, R., N. Tirrell, and D. Kloepfer, “The wealth of nature: New economic realities in the Yellowstone Region,” 1992 Report of The Wilderness Society, Washington, DC, are similar.

53 Rasker quoted in Harris, 23.

54 Kirk Louis Johnson, “Beyond Polarization: Emerging Strategies for Reconciling Community and the Environment,” report of the Northwest Policy Center, University of Washington, quoted in Harris, 24.

55 The Decade of Destruction: How the Mining Companies Betrayed Their Promised Greening,” *Mines and Communities* online article at <http://www.minesandcommunities.org/article.php?a=1670>

56 Godoy, 208.

57 Various, “Community Environmental Health Assessment Toolbox for New Mexico,” 2004 report by Southern Area Health Education Center & NM Department of Health Environmental Health Epidemiology Bureau, 50.

58 Guillermo de Los Reyes and Antonio Lara, “Civil Society and Volunteerism: Lodges in Mining Communities,” *Annals of the American Academy of Political and Social Science*, 565(1999): 220.

59 Godoy, 207.

60 For information on this phenomenon outside North America see Geoff Eley, *Forging Democracy: The History of the Left in Europe, 1858 – 2000*, (Oxford University Press, 2002.) Eley discusses extensively the European connection between mining unions, labour movements and the political left in this period.

smelter went on strike for an eight hour work day in 1917.<sup>61</sup> Another legacy of those early miners was a strong tradition of voluntary societies, which followed settlement patterns into Canada.<sup>62</sup>

Early miners in California and Montana were part of a largely itinerant brotherhood. These men swarmed into Canada in large numbers during the early nineteenth century with the first gold rushes, including some thirty thousand into British Columbia in 1858 alone.<sup>63</sup> Isolation, hardship and lack of women fostered bonds between such men which were not solely about traditional masculine pursuits such as gambling and drinking, but about trust, brotherhood and other emotional connections.<sup>64</sup> These bonds were often formalized by acceptance into societies. The most striking example is that of Freemasonry, which was so important in many early mining communities in North America that many communities today bear the names of leading Masons, or variations of the word Masonic.<sup>65</sup> Butte, Montana, a town settled by mining, had a Grand Lodge established by 1866, the first voluntary society in the town, a common pattern in similar communities in the United States.<sup>66</sup> Masons and other fraternal societies have also flourished in Canadian mining towns, spreading outward from there. Barkerville had a lodge as early as 1871, and Kimberley's Masons received their own lodge in 1909. Knights of Columbus, Elks, Moose, Foresters, Knights of Pythias, Eagles, Odd Fellows, Hibernians, Scandinavian Brothers all had strong chapters in the region by the advent of World War I.<sup>67</sup> Mining communities showed the highest growth in these societies throughout the late nineteenth and early 20<sup>th</sup> centuries, and still retain strong membership at a time when it is radically declining elsewhere.<sup>68</sup> Especially in the early years, when mining was highly dangerous and the environment hostile, miners were attracted to the sense of fraternity and friendship offered by these organizations.<sup>69</sup> They provided cemeteries, burial costs, pensions and benefits for widows and orphans at a time when unions could not. They also provided a religious center where churches had not yet been built, entertainment where none was available, and later funded community buildings and activities.<sup>70</sup> These societies, ironically, provided an organization that could also be harnessed by reformers, as well as the mining companies themselves, to promote their own economic and social agendas.

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61 The 1918 death of Goodwin at the hands of police near Cumberland on Vancouver Island is widely credited with sparking the Vancouver General Strike of that year.

62 For a good discussion of a different pattern of community life, see David M. Rayside, *A Small Town in Modern Times: Alexandria, Ontario*, (Montreal and Kingston: McGill-Queen's University Press, 1991.) In particular, 28 for the comparative lack of activism in non-resource towns and 150-153 for the different paths taken by voluntary societies that did not have a male mining contingent as the primary introduction of community organization.

63 Fetherling, 75 - 77.

64 Adele Perry examines the bonds formed by men in the early mining culture of B.C. in "Bachelors in the Backwoods: White Men and Homosocial Culture in Up-Country British Columbia, 1858-71," in *Beyond the City Limits*, 180-194.

65 For examples of this phenomenon, the web site for Masonry in BC and the Yukon lists towns (such as Burnaby and Powell River), landmarks and street names with Masonic origin at <http://www.freemasonry.bcy.ca/history/placenames/index.html>, and many regional Masonic organizations have similar sites. Many areas in California, a stronghold of miner Masons in its early days, bear place names that are variations of the word Mason or of Masonic terms.

66de Los Reyes and Lara, 219-221.

67de Los Reyes and Lara, 219.

68One of the problems in demographic and social research on mining communities remains the lack of organized sources for comparison data. For voluntary and benevolent societies, the best sources remain the individual organization records, but some compilations and summaries have been begun. See "The National Council for Voluntary Organisations from 1919 to 1993," an online article for the National Council for Voluntary Organization, an United Kingdom group, at its website at <http://www.ncvovol.org.uk/about/index.asp?id=2769&terms=membership%20numbers> for numbers and data on membership to voluntary societies in the UK, as well as history of the organizations from 1919 onward. Membership and activism have always been strong in small communities, and frequently focussed on problems in the coalfields, as with the 1930s unemployment in that sector. The Freemasons official international web site at <http://www.msana.com> is another good source for information. In particular, see article "It's About Time," at [http://www.msana.com/abouttime\\_intro.asp](http://www.msana.com/abouttime_intro.asp) discussing the general downward trend in membership of voluntary societies of all kinds as well as the Masons. This includes a graph of 1921-present membership, with decline most marked after 1959. For North American data, an independent source is various sites by Paul Bessel referring to Freemasonry, accessed Oct 12, 2008 at <http://www.bessel.org/webindex.htm>.

69Felix John Vondracek, "The Rise of Fraternal Organizations in the United States, 1868-1900." *Social Science* 47 (1972): 26-33 provides a good breakdown of the different types of organizations available to miners and what specific benefits each offered.

70 de Los Reyes and Lara, 223.

Missionaries and social reformers influenced by the ideals of Victorian society bemoaned the perceived instability, violence and immorality that flourished in the absence of (white) women.<sup>71</sup> It was perceived that an orderly and long-term work force needed the stability of family, which led companies to create family housing and encourage female settlement.<sup>72</sup> It also led management to encourage social organization and activities which supposedly fostered stable family relations among the working class. For Victorian reformers, this made self-control and self-improvement their rallying cries, and voluntary societies gained favour with the class that owned mining companies.<sup>73</sup> Owners and managers encouraged membership, and as the population shifted towards family groups, societies and their auxiliaries involved women, children and retired mine workers in the community. This created wider social bonds beyond the homosocial work-related connections, cementing a sense of community and of communal responsibility. Modern economic and social realities have changed the perceptions of voluntary and fraternal societies, and in mining and resource communities, have provided another impetus for membership that is lacking outside those types of communities. Vulnerable to shifts in employment due to the specialization of their trade, those with mining-specific skills continue to exploit the bonds of societies in order to find and keep jobs, as well as use the benefits associated with membership. In developing countries with resource extraction, there is another benefit to membership in and promotion of such groups, and thus to proximity to a mining community. They have been identified by the United Nations, World Bank and U.S. Agency for International Development (USAID) as possessing valuable infrastructure, organizational abilities, and the trust of the populace, allowing them not only to promote the unity of workers and families to lobby for better health and working conditions, but also to act as avenues through which to efficiently funnel international aid.<sup>74</sup> In Canadian communities, the sense of belonging and community involvement created by generations of membership in fraternal orders, voluntary societies and their auxiliaries have been a major factor in encouraging family and group loyalty to a particular town. That attachment goes beyond loyalty to a single employer, and indeed survives that employer when a single-industry town has lasted long enough to nurture multiple generations.

Although mining and mining communities are often stereotyped from the outside as primitively capitalist and of low status, those who grow up in those communities tend to appreciate this sense of community.<sup>75</sup> Even if they must leave for education or work, nostalgia often prompts them to return for retirement. This adds a mature phase to the life of resource towns, one that extends their life

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71 Discussed by Perry, who also asserts that the presence of aboriginals in close contact with whites caused further concern. In eighteenth and early nineteenth century North America, the presence of white women was considered a deterrent to what one missionary referred to as “the prevailing vice, concubinage with native females.” Perry 189. Of course, no one expressed concern at the time about what effect the proximity of mining camps was having on aboriginal society, beyond the concern about native workers having access to alcohol. For a general discussion of Victorian ideals in this respect, especially the thrust of reformers to improve the morals of the working class, see *Victorian Values: Personalities and Perspectives in Nineteenth-Century Society*, Gordon Marsden editor, Longman, London and New York, 1990. Although focussed on Britain, Alastair J. Reid’s *Social Classes and Social Relations in Britain 1850-1914*, Cambridge, Cambridge University Press, 1995 very clearly delineates the prevailing concepts of class as they related to skill and type of work.

72 Belshaw uses Arthur Lower’s notion of the female scarcity model to account for the patterns of population growth in ‘new’ lands where birth rates are generally high, due to the relative youth of settlers, and “the limiting factor is usually the scarcity of women” in “Rurality Check,” 201. It was accepted as common truth for boosters and company owners trying to settle early towns that long-term growth could only occur with women.

73 Reading societies and other self-improvement groups often started from fraternal organizations, and groups such as the Freemasons frequently encouraged such pursuits throughout the male population.

74 For a discussion of the merits and limitations of this idea, see Quintan Wiktorowicz, “The Political Limits to Nongovernmental Organizations in Jordan,” *World Development* 30:1, January 2002, 77-93.

75 Surveys in small towns and resource towns in several countries have revealed that while employment factors are a major reason for initially moving to such a community, “lifestyle” and “small-town atmosphere,” and variations of those terms were also major factors, and these latter reasons were listed as the most popular motivators for staying in such a community. See particularly Australian study D.N. Parkes, I.H. Burnley, and S.R. Walker, “Arid Zone Settlement in Australia: A Focus on Alice Springs,” Report for United Nations University, United Nations University Press, Tokyo 1985. For American studies see “Retirement Relocation Among College Graduates: A Survey of Virginia Tech Alumni,” a report for Virginia Center for Housing Research, Virginia Polytechnic Institute and State University, 1995, available online at <http://www.vchr.vt.edu/pdfreports/trrtpub.pdf>; Canadian studies include Matthiasson, J.S. Resident Perceptions of Quality of Life in Resource Frontier Communities, Center for Settlement Studies: University of Manitoba: 1970.

beyond mere extraction and continues the social influence of the towns. This has been demonstrated in Kimberley, where by the time the mine was finally non-viable, there was too much social investment in the town for it to simply collapse. When the mine closed in 2002, Kimberley had already planned for and begun the transition to tourism, golf, skiing and related non-industrial methods to ensure the town's survival. Continuing the tradition of versatility and invention shown by the founders and early pioneers of the Sullivan mine, in the early 1970s Kimberley began attracting tourists to its lovely alpine setting by transforming the center of town to resemble an old-fashioned Bavarian village.<sup>76</sup> Today, tourism and festivals provide a large proportion of the town's employment. "If it wasn't for the Bavarian theme, we'd have been an old dead mining town right now," says Bill Spence, a historian with the Kimberley Bavarian Society Chamber of Commerce.<sup>77</sup> While an initial out-migration of youth seeking employment occurred, the town is now stable and continues to attract residents seeking small-town life. Due to their being predominantly single-employer towns, and their often isolated and mountainous location, resource towns, especially hard-rock mining towns, remain smaller than diversified economic communities. The two types of mining camps that become permanent communities are those with a long-lived mine, and those whose location allows them to naturally accumulate urban growth.<sup>78</sup> Lucrative gold mines in Nevada's Comstock Lode or the coal mining towns of Great Britain are examples of the first type, and Denver, Colorado or São Paulo, Brazil are examples of the second type. Those communities with a long-lived mine, but lacking a variety of resources or an accessible location remain smaller, only some few attaining even the size of small cities. Thus Kimberley and similar resource towns have also benefitted from an increasingly positive perception of the social attributes of small cities and towns in general.

By the 1970s public policy that favoured urban growth for its own sake was experiencing a period of questioning and re-evaluation.<sup>79</sup> Promotion of growth was, for the moment at least, "largely passé in Canada.<sup>80</sup> A previous focus on simply growing was replaced with a greater concern for quality of urban experience and orderly expansion. This was largely a result of influential work in field of urban sociology, especially the seminal 1968 work of Lithwick and Paquet, who both identified an "urban crisis," and recognized the need for more study of the positive potential of cities.<sup>81</sup> In 1971 the federal government began the Ministry of State for Urban Affairs, and a stated goal of this ministry in 1973 was to coordinate all three levels of government in recognising the "need to redistribute growth towards small or medium sized towns or new towns."<sup>82</sup> Although the Ministry was ended in 1979, the

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76 The inspiration for the Bavarian makeover most likely came from another resource town, Leavenworth, in Washington State. This US former lumber town attempted to battle the economic results of loss of railroad and timber revenues by transforming the town into a Bavarian tourist destination in the 1960s. Kimberley town planners visited in 1972, and shortly after installed the centerpiece of Kimberley's Bavarian makeover, Happy Hans, the world's largest cuckoo clock at the time. Emily Green, "A Couple's Defining Moments," *Los Angeles Times*, March 11, 2003.

77 Bill Spence is also the engineer of the Happy Hans clock. Green, "Defining Moments," 3.

78 Although some famous large cities have originated as mining communities, such as Denver, their location has facilitated such development. Proximity to grazing land and lowlands, navigable rivers and additional resources allow some mining towns to develop into multi-industry towns. When there is also sufficient land for road and home building, there are favourable conditions for expansion. Towns like Kimberley are prevented from this by their rugged location, a common situation for hard-rock mines, and indeed many resource towns located throughout the many mountain ranges of North America.

79 Canada was not alone in this shift in policy, Britain, France and the United States preceded Canada in public policies on decentralization. The ideological change is thought to be a direct result of the severity of inner-city problems, including the growth of the income gap in urban areas. For an economic examination of decentralization, and the ambiguous phenomenon of suburbanization, see Peter Mieszkowski, "Urban Economics," in *Social Economics*, John Eatwell, Murray Milgate, Peter Newman eds., (London: Macmillan Press, 1987), 253 – 268.

80 Stone, Leroy O. and Claude Marceau, *Canadian Population Trends and Public Policy Through the 1980s*, McGill-Queen's University Press, Montreal and Kingston, 1977, 40. See also surrounding discussion on the overall geographic redistribution trends.

81 N. H. Lithwick and Gilles Paquet, quoted in *Urban Affairs: Back on the Policy Agenda*, Caroline Andrew, Katherine A. Graham and Susan D. Phillips eds., (Montreal and Kingston: McGill-Queens University Press, 2002), 4-9. The introduction deals with Lithwick and Paquet's several theses, and the remainder of the book shows the genesis of the field of urban studies since. The seminal studies referred to are *Urban Studies: A Canadian Perspective*, N. H. Lithwick and Gilles Paquet editors, (Toronto: Methuen, 1968); N. H. Lithwick, *Urban Canada: Problems and Prospects*. (Ottawa: Central Mortgage and Housing Corporation, 1970.)

82 These objectives were confirmed in the Ministry's annual budget study of 15 October 1974, as discussed in Leroy and Marceau, 62.

field of urban studies flourished in academia, and public opinion continued to support many of the conclusions of the studies of the 1970s. The coincident rise in popularity of environmentalism and the social sciences made smaller communities seem more attractive living spaces. The same things that made suburbs desirable for family living, like green space, opportunity to know your neighbours, a more relaxed pace, and freedom from inner city noise and pollution applied to small cities and towns. The perception of safety was an important factor in promoting the health benefits of small town living. In the 1950s and 1960s the social disorganization theories of Shaw and McKay, which attributed crime, particularly youth crime, to unstable communities, were the prevailing theory.<sup>83</sup> Although the theory later suffered a brief dip in prestige, recent criminologists have revived and refined the idea.<sup>84</sup> These studies were widely embraced in small communities, by boosters and residents alike, partly due to the common-sense appeal of the concept, and partly due to a coincident rise of anti-urban sentiment. Public policy on crime in communities showed that governments were on board the social agenda as well as the environmental. It was believed that urbanization had “weaken[ed] the forces of informal social control over the incidence of crime,” and placed more pressure on law enforcement agencies.<sup>85</sup> This led to an increased promotion of neighbourhood policing initiatives, and the social service community focussed on social ‘asset building’ to prevent delinquency and developing adult offenders.<sup>86</sup> It became a truism that small meant safer, and even when recent scholarship and statistical investigations have given the lie to these assumptions, residents cling to the belief that isolation from the well-publicized urban issues leads to lower crime rates.<sup>87</sup> Many studies on rural violence were interpreted by the public in a way that lent credence to the social disorganization theories. By focussing on small resource and boom towns which had experienced recent economic disruption, they were taken to show that *only* those towns lacking in the supposedly usual social stability of a ‘normal’ small town suffered these issues.<sup>88</sup> In fact, this assumption is false. Recent Statistics Canada reports indicate that not only are rates of overall crime higher in small towns, they are the only community type where violent crime is actually rising.<sup>89</sup> United States reported an identical phenomenon in 2008.<sup>90</sup> While in large urban centers, violent crime rates fell, in those with less than 10,000 residents, the rate was not just higher, it actually increased. Similar reports exist for Australia, Poland, parts of Italy and Norway.<sup>91</sup>

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83Bursik is among the most influential but also the most applicable to this discussion, since his studies address less urban areas than Shaw and McKay and most similar studies. Bursik supplies a clear definition of social disorganization as an inability of community members to achieve shared values or to solve jointly experienced problems in Bursik, Robert J. 1988. "Social Disorganization and Theories of Crime and Delinquency: Problems and Prospects." *Criminology* 26:519-551. For rural and youth studies see also "Ecological Stability and the Dynamics of Delinquency," *Crime and Justice*, Vol. 8, *Communities and Crime* (1986), pp. 35-66.

84 Bursik 1988 summarizes the trend.

85 Leroy and Marceau, 42.

86 D. Wayne Osgood and Jeff M. Chambers, "Community Correlates of Rural Youth Violence, The Office of Juvenile Justice and Delinquency Prevention Bulletin May 2003, online at <http://www.ncjrs.gov/html/ojdp/193591/contents.html>. provides an excellent summary of research on social disorganization and crime.

87There are a multitude of studies on the effects of economic disruption in small urban areas on social stability and crime rates. For studies on boomtowns see particularly Murdock, S.H., and F.L. Leistriz, *Energy development in the Western United States: Impact on Rural Areas*. New York, NY: Praeger, 1979.)

For research on small towns and rural areas see Krannich, R.S., T. Greider, and R.L. Little, "Rapid Growth and Fear of Crime: A Four Community Comparison," *Rural Sociology* 50: 1985, 191-209; Krannich, R.S., E.H. Berry, and T. Greider, "Fear of Crime in a Rapidly Changing Rural Community: A Longitudinal Analysis," *Rural Sociology* 54:1989, 195-212. It should be noted that not only are most of the studies done on areas of the United States, which mean that overarching national social factors may play a role, later scholars have raised issues with the methodology, namely concentration on small samples so that relatively few occurrences skew the results disproportionately. For a discussion of these issues and opposing research views, see Asha D. Luthra, "The Relationship of Crime and Oil Development in the Coastal Regions of Louisiana," PhD thesis, Louisiana State University, 2006.

88 See footnote 75.

89 Statistics Canada studies 3302, 3315 and 4504 used national 2005 police-reported data. Overall crime rate in small urban areas was 43 per cent higher than in large urban areas and 58 per cent higher than in rural areas. Rates of total violent crime, total property crime and break-ins were also highest in small urban areas. Homicide was an exception, with rates in rural areas seeing the only increase. StatsCan considers a small urban area as a community that has a population density of at least 400 persons per square kilometre and is not part of a large urban area, so suburbs are excluded. Large urban areas are defined as one or more adjacent municipalities centred on an urban core of at least 100,000. StatsCan studies are available online in searchable format at <http://www.statcan.gc.ca>

90 The full FBI report is available online at <http://www.fbi.gov/ucr/08aprelim/index.html>.

91 Edwin Hardin Sutherland, Donald Ray Cressey, David F. Luckenbill, *Principles of Criminology*, (Oxford: General Hall, 1992), 178-180.

In fact, these studies appear to show the assumptions about small communities were *always* false, and are not simply a symptom of some recent moral degeneration associated with modernity.<sup>92</sup> In actuality, the very smallness of a community may make it less resilient, less able to absorb change without damage to the social structure. However, since a community is first and foremost a community of belief, existing in the minds of its members, what is important in the context of community life in resource towns is not the veracity of claims of a small-town haven from crime, but the fact that they were universally embraced. Statistics claiming small towns are not safe are still greeted with scepticism, even disbelief. Safety is still listed as a primary reason for moving to smaller urban areas.<sup>93</sup> This is, of course, in sharp contrast to the growing trend of out-migration of young people.<sup>94</sup> Families and older people with greater desire for safety and stability gravitate to smaller centres, youth to larger centers for excitement, education and employment.<sup>95</sup> Still, though their working lives may be spent outside the mining community, the attitudes and perceptions of many Canadians are influenced by formative years spent in that type of community.

That influence is not relegated to Canada's past, as mining towns are continually developing, with a frequency that is dependent upon worldwide commodity prices. The technology of froth flotation continues to demonstrate its worth, especially since its chief strength, its versatility, is even more in demand as increasingly stringent environmental and energy efficiency regulations work on changing the entire industry. The process has been refined many times, including new fat and acid agents and the addition of electrical current to the flotation tanks. The latest efforts are focussed on making the process less energy-intensive by allowing the flotation system to handle larger particles of ore.<sup>96</sup> This not only saves time and money in the crushing process, it would make the entire refinement process more palatable to societies striving for lower carbon emissions. Since the environmental movement began in earnest in the 1970s, this has become a major part of mining companies' public relations and research initiatives. As Roy Aitken, an executive vice-president of Inco, the world's biggest nickel producer stated in 1989 to the Canadian Institute of Mining and Metallurgy, "The 1990s is going to be the decade of the environment..by the year 2000, all of us will be committed environmentalists."<sup>97</sup> Even as the balance between economic and environmental concerns in public policy and perception continues to shift away from uninhibited development, flotation technology still facilitates mine survival. Concerns about energy shortages and universal economic and employment needs make resource extraction a motivating factor in formation of new communities and the sustenance of existing ones.

Apart from the importance of extraction industries to developing economies in Africa and South America particularly, Natural Resources Canada estimates as of 2003 there were 185 towns or cities in Canada that were at least thirty-five percent dependent on mining, and over fifty of those were more than ninety percent dependent, with the concentration of these highest in the West.<sup>98</sup> These numbers do not take into account the many indirectly dependent communities. In 1971 R. Lucas argued that "small' towns, especially those relying on a single industry, provide the social milieu for

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92 Reports above span the twentieth century.

93 See footnote 68. Note that Matthiasson study unfortunately does not include a question on the perception of safety, but does deal with many other issues of resource towns not specifically addressed in previously mentioned studies.

94 For BC information, see "Migration of Rural Youth in British Columbia" a BC Stats report, available online at [www.bcstats.gov.bc.ca/pubs/mig/mig002fa.pdf](http://www.bcstats.gov.bc.ca/pubs/mig/mig002fa.pdf)

95 See footnote 70. Also, James A. Christenson, Lorraine E. Garkovich and Gregory S. Taylor, "Proruralism values and migration behaviour," *Population and Environment*, 16:3, Sept 1983, 166-178, discusses how employment-motivated emigration is primarily towards large urban centers, and all other types of emigration tend to smaller urban types since the rise of 'proruralist values.'

96 "Creating the Mine of the Future," Imperial College, London Press Release, 23rd May 2008, referring to research under way at The Rio Tinto Centre for Advanced Mineral Recovery at Imperial's Department of Earth Science and Engineering. Accessed on the Mines and Community web site at <http://www.minesandcommunities.org>

97 "The Decade of Destruction: How the Mining Companies Betrayed Their Promised Greening," Mines and Communities online article at <http://www.minesandcommunities.org/article.php?a=1670>

98 Natural Resources Canada Mining Atlas, accessed Sept 30, 2008 at <http://atlas.nrcan.gc.ca/site/english/maps/economic/rdc2001/rdcmin/1>. See footnote 34 for South American and African references.

more than one third of all Canadians.”<sup>99</sup> Current mineral exploration and extraction covers most of Canada, sustaining many of these mining communities, and with the potential to create many more.<sup>100</sup> The oil sands of the north have created large and wealthy single resource towns that will last as long as there is a need for a stable workforce, but it is the multitude of solid-mineral mines and explorations that demonstrate the continuing legacy of R. W. Diamond’s froth flotation technology.

In Canada’s settlement throughout the nineteenth and early twentieth century, mining was instrumental in developing remote areas, and continues today to dominate the economies of many small towns. Although mineral exploration developed mines and work camps, it could not create communities. Positive and negative, the characteristics of mining communities were formed by the longevity of the mines they were created for. This longevity was a direct result of major advances in refining technology - differential froth flotation. Market demand for minerals only sustained a mining town as long as a desirable commodity existed, and did not alter itself to suit the needs of the mine. Froth flotation technology allowed Kimberley, and countless towns and cities like it, to survive and flourish over generations by extracting and refining a wide variety of materials. This is a pattern repeated throughout the settled and developing world. In a larger sense, the more efficient refining of minerals also spurred electricity distribution and the modern industrial age. From the specific example of Kimberley and flotation technology, we can see that an examination of urban development in conjunction with technology other than that linked to transportation and building methods offers a lucrative new avenue for further research. Technology does not exist and improve in isolation from social factors. Our personal histories are lived in the aftermath of technological innovations, and all aspects of the present will someday be cited as the necessity that spurred further invention.

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<sup>99</sup> Etherington and Pinfield, 94.

<sup>100</sup> “Operating Mines and Selected Major Exploration Projects in British Columbia – 2007,” report by the Ministry of Energy, Mines and Petroleum Resources BC Geological Survey, at Natural Resources Canada Mining Atlas site, is a good visual representation of how many areas for future resource towns exist. Similar maps for other regions can be found at the same site.

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