

CATCHING GOLD FEVER: A SOCIAL HISTORY OF TYPHOID FEVER AMONG THE KLONDIKE GOLD RUSHERS, 1896–1904

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ABSTRACT

Informed by an anthropological perspective, this research employs archival data sources and a case study approach to explore the social history of a typhoid fever epidemic among residents of a historic gold rush community. While the source of contagion in the Klondike (contaminated water) is uncontested, and the underlying cause of the disease is known (habitually poor sanitation in Dawson City, YT), this research has provided the key to explaining why a statistically significant ratio of typhoid fever mortality was borne by a particular cohort of the community. This line of inquiry has in fact revealed contextually dependent qualities of the sociohistorical milieu of the gold rush community—namely the Klondike’s brisk market for (heavily) adulterated barroom whiskey and the habitual patronage of Dawson City’s saloons by adult male gold rushers—to have been ultimately responsible for the differential mortality burden from this disease observed among the stampedeers, while also offering a unique case study relevant to the broader social history of this infectious disease.

Since it occurred alongside the emergence of mass media in North America (Guest 1985), the Klondike gold rush is particularly well suited as a historic case study of the social history of typhoid fever. In addition to widespread newspaper coverage that has since been archived for research and posterity, the worldwide excitement surrounding “the last great gold rush” also generated a treasure trove of other historic documents that captured the diverse perspectives of the stampedeers. Drawing upon these materials, this research is grounded in the genre of historical anthropology and is informed by methods drawn from archival ethnography.

Conducting ethnographically informed research in contexts such as Klondike-era Dawson City (Fig. 1) presents a challenge given that the historic community is not accessible by traditional ethnographic methods. Historical anthropology has thus emerged as a specialization of anthropologists who are interested in engaging past communities in ethnographic research via archival data sources (Highet 2015). Anthropologist Harry Wolcott was among the first to encourage the use of nontraditional data sources

(such as archival documents) and methodology (archival ethnography) by urging: “[i]f there is a place, a setting, of genuine interest to you, I hope you can find a way to get there” (Wolcott 1999:30). Archives can serve as one means for achieving this goal since each institution contains a rich tapestry of voices recorded in historic documents that speak to the interconnected lived experiences of those represented therein. Furthermore, overlapping perspectives pertaining to a single event or concern of the community allow the researcher to weave together multiple perceptions, resulting in a dynamic view of the life of the community and its inhabitants. In the archive, Klondike society comes alive through the memoirs and diaries of the stampedeers. Reading government and police records opens a window into societal issues that weighed upon the minds of community members. Likewise, discourse preserved on newsprint invites the reader into discussions carried out on street corners and in public offices, while restaurant menus and advertisements for local businesses carry one into the social centers of Klondike life. By immersing oneself in archival records and spending a considerable amount of time



Figure 1. A view of Dawson City looking down from the trail to the mines. National Museum of Canada, Library and Archives of Canada, PA-013363.

among one's informants in this research setting, an ethnographically minded historical anthropologist is capable of appreciating nearly as much of an emic perspective as is an ethnographer who goes to live among their informants. In this context, a historic anthropologist also benefits from the retrospective gaze, which permits observations to be situated in the ethnographic present, while also witnessing the long-term consequences of how various aspects of the social world of their subjects unfolded.

Historical anthropologists have employed archival data sources for a wide range of purposes, including community-based studies across geographically diverse populations situated throughout the historic era (e.g., Burke 1999; Burke and Sawchuk 2001, 2003; Herring 1993; Madrigal 1992, 1993, 1994, 1996, 1997; Madrigal and Koertvelyessy 2003; Madrigal et al. 2003; Padiak

2005; Sawchuk 2009; Sawchuk and Burke 1998, 2000, 2003, 2007; Sawchuk et al. 2002; Sawchuk and Herring 1984). Here, a case study approach will explore the social history of the typhoid fever epidemic that ravaged Dawson City at the height of the Klondike gold rush. Several scholars have remarked upon the presence of typhoid fever among the Klondikers (e.g., Lux 1989; Porsild 1998; Stone and Potsdam 1996; Willis 1997) and in other gold rush communities (Baur 1949; Marks 1994), while others have explored typhoid fever in the north more broadly (Fortune 1989; Gaub 1951; Gordon and Frank 1959; Pauls 1953; Wolman and Gorman 1931). These accounts have, however, been limited in the sense that they have not moved beyond reporting incidence, documenting the experiences of a handful of sufferers, or citing poor sanitation as the root cause of the outbreak of the disease. A

review of the literature indicates that this is the first exploration of the social history of typhoid fever to be situated in any of these contexts. As such, this analysis will be relevant to a range of interests, including the social history of epidemic diseases, such as typhoid fever, specifically in the case of historic gold rush and boomtown communities throughout North America but also, particularly, in the far north. This is further significant given that although an outbreak of typhoid fever among residents of a remote gold rush boomtown is not surprising, the skewed distribution of both morbidity and mortality that characterized the disease in this community was unexpected.

TYPHOID FEVER

The name Mary Mallon has become nearly synonymous with *Salmonella typhi* (*S. typhi*) over the century since “Typhoid Mary” rose to notoriety. The now infamous outbreaks of typhoid fever attributed to Ms. Mallon in the early twentieth century were significant not only with regard to the bold-font headlines that they commanded, but also because the epidemics heralded the discovery that asymptomatic individuals could serve as a reservoir for the bacterium within a human population. Even into the twenty-first century, we are reminded that when it comes to the relationship between humans and the ailments from which we suffer, there truly is *no culture-free way to think about disease*.

Typhoid fever is an infectious disease caused by *S. typhi* and spread via the fecal-oral route, most often through the ingestion of contaminated water. The bacterium is only able to colonize the human gastrointestinal tract, meaning that this disease is preventable through the implementation of effective sanitary protocols (LeBaron and Taylor 1993). Epidemics of typhoid fever usually produce predictable seasonal intervals of both morbidity and mortality as infection rates peak in summertime months. This may be due to either increased consumption of contaminated water or bacterial proliferation during the warmer season, since virulence is positively correlated with the quantity of bacterium ingested (LeBaron and Taylor 1993). Once infection occurs, the disease takes several weeks to run its natural course. Thus, a subsequent peak in deaths from this cause often follows in the fall months as a consequence of the rise in summertime sickness (LeBaron and Taylor 1993). Typhoid fever is thus intimately linked to local conditions, since outbreaks in a community correspond to localized breaches in sanitary

protocol that otherwise functions as an effective barrier against contagion. Antibiotics have proven to be a powerful tool for stemming the health burden of typhoid fever. In the case of the Klondike, however, medical intervention was limited to palliative care since the gold rush occurred in the preantibiotic era. This analysis highlights the fact that knowledge of social and cultural factors, in addition to environmental considerations, can prove essential for understanding the impact of infectious diseases such as typhoid fever in a given time and place.

A BRIEF HISTORY OF THE KLONDIKE GOLD RUSH

Dawson City was founded on the mudflat junction of the Yukon and Klondike Rivers following the discovery of gold on Bonanza Creek in 1896. The location was selected for its potential as a supply center and transportation hub; however, it was nevertheless built upon permafrost in an area that was prone to annual flooding, resulting in a seasonally soggy, boglike town site.

Dawson City grew rapidly due to the influx of gold rushers, accumulating a population of 500 residents within its first few months (Porsild 1998). In the spring of 1897, the riverfront and commercial districts were built up, and the community experienced its first boom period, although most newly arrived residents continued to live in tents pitched haphazardly around the town site. Gold rushers trickled steadily into Dawson City throughout 1897, and by the year's end, the population had tripled to total 1500 people living within the limits of Dawson City proper (SPDC 1898). Following the breakup of ice on the Yukon River in May 1898, the community underwent another period of rapid and dramatic transformation, as this was the year that the stampede began in earnest. In just a few months, the population of Dawson City swelled to 4236 (SPDC 1899), making it the largest Canadian city west of Winnipeg at that time (Guest 1985). Despite being only two years old, Dawson City also boasted two newspapers, five churches, two banks, a pair of hospitals, and telephone, electric light, and acetylene gas services in 1898. Although the fervor surrounding the Klondike strike peaked in 1898, Dawson City's population continued to grow, reaching 5404 in 1900, 6695 in 1901, and finally 7000 individuals in 1902 (DDN 1900a; LAC 1901; SPDC 1903). By 1904, the Klondike reached a turning point as the majority of the gold seekers departed the community in search of fresh prospects

or simply returned home. As more heavy machinery was brought into the region, corporate-owned dredges came to replace the work of individual miners and their partners. This shift heralded the end of the era of placer and quartz mining in the Klondike. In light of this, the year 1904 therefore serves as a logical upper-chronological limit for the time frame of this study.

MATERIALS AND METHODS

For the purpose of statistical analyses intended to explore differential trends of morbidity and mortality among the Klondike gold rushers, two separate databases were generated using data collected from the Death Register for the Yukon Territory (YVS 1896–1904), and the Patient Register for Saint Mary's Hospital (Yukon Archives 1900–1904). The Pearson chi-square method of analysis was employed using SPSS Statistics for all analyses, with the confidence interval established at .05. While this type of analysis is not capable of discerning causal relationships among variables, the associations observed may nevertheless lead to important insights when interpreted alongside qualitative data. Taken together, this methodology offers a rich, holistic perspective that permits socially relative and historically informed interpretations to complement the observed statistical associations.

The first database constructed consisted of all entries noted in the Death Register for the Yukon Territory ($n = 754$ excluding stillbirths, of which there were five) that occurred throughout the Yukon during the period of study (1896–1904). On the whole, data gathered from this source were characterized by a high degree of completeness considering the context and era in which the records were created. Both the year and month of death were recorded for 99.9% of individuals represented. Other categories displayed similarly high levels of completeness, including biological sex (100% complete), age at death (78.2% complete), and profession (52.7% complete). A cause of death was recorded for 87.6% of all individuals, and a physician was noted to have attended the individual at the time of their death in 69.5% of all cases. Confidence can therefore be had in the accuracy of the recorded causes of death for these individuals. As is often the case with historic vital statistics documents, occupations other than “housewife” were rarely noted for women (Inwood and Reid 2001). In order to accommodate for this bias, occupational identification has been limited to males fifteen years of age or older when it has been taken as an indicator of socioeco-

nomic status in this study. Concern over the possibility that a significant number of deaths went unreported is minimized given that the North West Mounted Police required that all deaths that occurred within their jurisdiction (throughout the Yukon) be formally registered, under threat of fine or possible imprisonment (SPDC 1899).

To capture a representative picture of the health of a historic population, morbidity data is an essential complement to mortality statistics since “causes of death are not always important causes of sickness and vice versa” (Alter and Carmichael 1996:44). A second database was therefore constructed composed of data drawn from the Patient Register for Saint Mary's Hospital for the years 1900–1904 ($n = 1258$ admissions). This hospital operated in Dawson City throughout the gold rush era, receiving both paying and indigent patients and serving the entire community residing in the vicinity of the gold fields. While the Patient Register unfortunately only included entries dating back as far as 1900, on the whole, the data contained therein nevertheless displays an even greater degree of completeness than does the Death Register for the Yukon Territory. Although another hospital (the Good Samaritan) also operated in Dawson City throughout the period of study, no records remain from that institution. The Patient Register for Saint Mary's Hospital therefore represents the only extant source of morbidity data for the Klondikers.

The morbidity database therein compiled for this study obviously does not capture all instances of illness that occurred among the stampeders, but no study is capable of capturing an exhaustive record of all the sickness that occurred within a historic population. This is due to the varied care-seeking behaviors employed by people in times of illness. As such, it is important to note that although the burden of sickness from typhoid fever that is documented within the gold rush community is considerable, it must nevertheless be understood as being under-represented by the available data.

TYPHOID FEVER MORBIDITY AND MORTALITY IN THE KLONDIKE

Deaths from typhoid fever accounted for 13.3% ($n = 100$) of all mortality in the Yukon between 1896 and 1904. Typhoid fever posed a significant threat to the Klondikers' well-being, falling second only to all manner of accidental deaths combined in the number of lives claimed throughout the period of study. In fact, significantly more individuals died from typhoid fever than any other condition in

both 1898 and 1899 ($\chi^2 = 213.804$, $df = 6$, $p < .001$). Not surprisingly, these years correspond to the period prior to the implementation of a reliable supply of safe drinking water in Dawson City, while typhoid fever declined immediately after the introduction of a municipal water company in Dawson City. This trend is likewise mirrored in patient admissions to Saint Mary's Hospital: as late as 1900, significantly more cases of typhoid fever were seen at this hospital relative to all other ailments being treated there, combined ($\chi^2 = 28.116$, $df = 4$, $p < .001$).

THE LOCAL DISEASE ENVIRONMENT

Given the fecal-oral transmission route of *S. typhi*, the fundamental basis of the threat posed by typhoid fever among the Klondikers was the fact that Dawsonites lacked sufficient facilities for maintaining segregation between waste and the water that was used for human consumption. For their part, the Klondikers were not oblivious to the underlying cause of their suffering, as writers for the *Dawson Daily News* observed that "the rapid increase in the number of typhoid cases points out the necessity of strict sanitary precautions against its spread" (DDN 1899a). Thanks to public discourse, it seems that the gold rushers made it a practice to boil all the water that they used for domestic consumption. This stemmed both from necessity, in order to melt frozen supplies in the winter months, and from the advice of the medical health officer, who reported:

We ask ourselves as all sanitarians should do, what are the causes of [this] disease? The answer, so far as our duties were concerned, was... impure water. The water question was [to be] settled in the following way: The sources from which it could be obtained were specified, and where practicable, the boiling of water was insisted upon, we had placards posted up in all public places, calling the attention of the people to the act, that for all practicable purposes typhoid could only be prevented by the exclusive use of boiled water (SPDC 1900:76–77).

Both the risks and the means of protecting oneself from contracting typhoid fever have been documented as common knowledge among the Klondikers. In this light, the preventable nature of the disease, its differential distribution among certain segments of the community, and the timing of its subsequent decline represent important pieces of the puzzle for understanding the social history of typhoid fever in this time and place.

For several months of the year, the primary means of disposing of waste in Dawson City was dumping it into

the current of the Yukon River. When the river froze up in the fall, however, refuse remained where it was dumped, accumulating in a massive pile atop the ice (Fig. 2). In the spring, the snow and surface ice began to melt long before the ice went out of the river. Under these conditions, the springtime ice afforded only the perception of a barrier between the waste piled above and the water that was drawn from beneath through drinking holes cut in the surface (Fig. 3). Dawsonites knew that residue from the "melting of filthy snow on the Yukon around the many water holes" seeped through cracks in the ice, and that "poison taken into the system from such polluted water mean[t] linger[ing] disease [or even] death" (DDN 1900b). The fact remained, however, that water was needed, local sources were limited, and it had to come from somewhere.

The local environment proved a further challenge to maintaining sanitary separation between water and waste in Dawson City in that the permafrost foundation was incapable of absorbing the annual runoff from the springtime thaw. The risk of typhoid fever therefore intensified in the spring months when Dawson City resembled "one vast swamp...still in almost primitive condition, or even worse, cess pools [*sic*]" (SPDC 1900:76–77), which served as an ideal breeding ground for the bacterium that subsequently contaminated freshwater sources around the community (Fig. 4). Thus, while many gold rushers placed their faith in nearby springs rather than take their chances with water drawn from the river, such precautions were not infallible (Fig. 5). The springs in the vicinity of Dawson City (mistakenly assumed to contain pure groundwater) were in fact formed through the "soakage into somewhat deeper holes from the adjoining swamp," and so they were also indirectly contaminated by surface water that ran into them (SPDC 1900:76–77). Prior to the introduction of a municipal water system, all residents relied upon one or another of these water sources for domestic consumption, so local officials were right to be concerned that a dangerous situation was brewing in the boomtown. In light of this, various entrepreneurs were permitted to capitalize upon the situation, and a water market emerged in Dawson City.

Having realized another means by which profit could be extracted from the Klondike, numerous vendors were soon peddling a variety of water products in Dawson City, each of which was advertised as having been purified through some method of distillation, filtering, and/or boiling. These unregulated distributors sold their product by the bucket, dispensed from wagons driven down the



Figure 2. Garbage piled on the river ice at Dawson City. Henry Joseph Woodside, Library and Archives Canada, PA-016547.

streets of Dawson City; out of barrels carried by mules; or even from reservoirs strapped to a sled and pulled by a team of dogs (Fig. 6). Many of Dawson City's food and beverage establishments also advertised in the *Dawson Daily News* that they served only "pure" water, although few were inclined to specify the source of their product. Rather, "pure" water was simply listed as a quasi-specialty item on local menus alongside other delicacies such as pastries and oysters imported from the south.¹ Whether or not there was a legitimate difference in quality between the water offered by the various dealers, the drinking water procured from groundwater sources, or the water taken directly from the river remains a matter of speculation. Although the North West Mounted Police threatened to prosecute and fine people "discovered [to be] taking water from unauthorized sources" (SPDC 1900:76–77), there were no practical means by which either customers or local officials could be guaranteed that advertisements for "water, rendered pure and germless" really satisfied that claim.² This reality is reflected in the order issued by the medical health officer that people continue to boil their

water, regardless of its source, since it was, he warned, "through the water that [typhoid] germs reach the system" (DDN 1900c).

The first systemic water distribution scheme established in the community was the Dawson Water Works, founded by Colonel Samuel Word in September 1899. Water was drawn from a deep well and then dispensed for sale through twenty taps placed along the company's H-shaped water main. Verified by "eminent chemists in the west" and guaranteed to be free from both mineral and vegetable matter, Colonel Word charged "50 cents to 75 cents and \$1.00 up, depending on the size of the families using the water...[with] all rates [to] be determined between [him]self and the consumers" (DDN 1899b). This offered Dawsonites their first respite from the contaminated sources that the stampedeers had been relying upon since the community was established. However, the company ultimately failed when the water mains froze in the winter, forcing Colonel Word to shut down his inoperable system on December 20, 1899. While local residents decried the loss of the "pure, wholesome water [that had]



Figure 3. Men taking water from a frozen river at Dawson City. George G. Murdock, Library and Archives Canada, PA-022496.

had so much to do with the [enduring] good health of the city," the Dawson Water and Power Company soon opened for business (DDN 1899c). By laying its network of pipes directly along the surface of Dawson's streets, with plans to bury them later in the year, the new waterworks was able to open at full operational capacity on April 17, 1900. This company drew its supply from another deep

well and quickly extended water service to all business and residential areas of the city for the first time in Dawson City's brief history. The appreciable health benefit attributed to the provision of a reliable supply of drinking water in Dawson City is evident in the marked reduction of typhoid fever patients admitted to Saint Mary's Hospital following this development.



Figure 4. Dawson City's Main Street resembled a swamp following the annual spring thaw. George G. Murdock, Library and Archives Canada, C-000666.

Although the Patient Register for St. Mary's Hospital did not record admissions prior to 1900, other data sources are available that attest to the significant reduction in patients being treated for typhoid fever by the time such records were being kept. In both 1898 and 1899, for example, firsthand accounts of the annual epidemics of typhoid fever recall Saint Mary's Hospital overflowing with patients:

Every day new patients were brought to the hospital, so that in two weeks the limited space was filled....With the aid of devoted and charitable friends, [Father Judge] immediately undertook the construction of an addition to the hospital, three stories high and seventy feet long by twenty wide, and of a wing twenty-three feet long by twenty-eight wide. The work was pushed forward with vigor. As fast as a story was finished, the sick were transported into it...the hospital was always full [of typhoid patients] (Judge 1907:237–238).

Yet by 1900 the hospital admitted a mere twenty-eight cases of typhoid fever throughout the entire year. This decline in numbers is all the more significant considering that the population of Dawson City continued to grow throughout this period.

TYPHOID FEVER IN THE KLONDIKE

The population of Dawson City proper at the time of the 1901 Census of Canada reveals that the community was largely composed of men (81.2%, $n = 5437$) aged fifteen years or older (79.6%, $n = 5330$). Despite prevailing misconceptions, however, there were also a considerable number of women present in the Klondike ($n = 1253$), accounting for just under 19% of the total population of Dawson City. Furthermore, children under the age of fifteen ($n = 411$) accounted for just over 6% of the population. Although the population was certainly skewed towards young males, the Klondike was by no means the exclusive “young man's realm” that romanticized reimaginings of the “last great rush” remember it to have been (Hight 2015).

As predicted based on historical trends, a peak in morbidity incidence from typhoid fever was observed in the Yukon during the warmer months, with significantly more admissions for patients suffering from this disease having been made during both summer (June–August) and fall (September–November) months than for all other ailments combined ($\chi^2 = 13.429$, $df = 3$, $p = .004$). This



Figure 5. A local spring from which Dawsonites collected their drinking water. E.A. Hegg, Library and Archives of Canada, PA-013437.

pattern of seasonal hospital admissions for typhoid fever is also captured in a local newspaper commentary that reminisced:

Last year [1898] it will be remembered, the ravages of typhoid were greater in the months of August and September than at any other period. This year promises to be no exception (DDN 1899a).

This seasonal pattern of sickness led to a corresponding distribution of mortality, with significantly more deaths from typhoid fever having occurred between the months of September and November than at any other time of year and in contrast to all other fatalities combined ($\chi^2 = 48.031$, $df = 3$, $p < .001$). According to the Patient Register, the majority (72.7%) of patients suffering from typhoid fever at Saint Mary's Hospital were hospitalized for at least three weeks. Thus, it can be reasoned that individuals who contracted the disease in the summertime or early autumn would have been sick for several weeks before either recovering from or succumbing to the disease.

All else being equal, typhoid fever does not discriminate and will infect all susceptible individuals within a population upon ingestion of sufficient quantities of the bacterium. Trends observed in the mortality data make it clearly apparent, however, that the Klondikers were being differentially exposed to the bacterium. To understand the social dimensions of the typhoid fever epidemic in the Klondike, it is therefore necessary to consider not only *when* individuals were suffering from typhoid fever, but also *who* it was that contracted the disease.

TYPHOID FEVER STRIKES THE GOLD RUSHERS

While infectious diseases tend to differentially claim the lives of the very young and elderly members of society, whose immune systems are weak or compromised, it is notable that no deaths from typhoid fever occurred among children under the age of fifteen anywhere in the Yukon throughout the period of study. Individuals of reproductive

age (fifteen to forty-four years old), on the other hand, were significantly more likely to have died from typhoid fever than any other cause relative to their fellow gold rushers ($\chi^2 = 24.388$, $df = 2$, $p < .001$); and significantly more males than females succumbed to the effects of typhoid fever in the Yukon relative to all other causes of death combined through the period of study ($\chi^2 = 16.594$, $df = 1$, $p < .001$). While men certainly outnumbered women in the Klondike (the 1901 Census of Canada reveals the ratio of males to females residing in Dawson City to have been approximately 4:1), all else being equal, men and women should be at equal risk of infection by *S. typhi*. The fact remains, however, that ninety-six males and only four females (a ratio of 24:1) died from typhoid fever in the Yukon between 1896 and 1904. Archival sources further support the interpretation that something more than a skewed sex ratio was responsible for producing the differential pattern of mortality that characterized typhoid fever in the Klondike. That is, while newspaper accounts never speculated beyond contaminated drinking water as

a source of men's afflictions with typhoid fever, the ultimate cause of women's suffering from the disease was often attributed to caring for males in the household. In this vein, one report (among many) in the *Dawson Daily News* explained:

In Mrs. Charles Anderson Dawson has an example of wifely devotion. When her husband was ill with typhoid fever, Mrs. Anderson bravely nursed him throughout his sickness. Hardly had he become convalescent when she contracted the disease from him and became dangerously ill (DDN 1903:n.p.).

Reports of this nature are intriguing because they attest to the highly contagious nature of typhoid fever while also suggesting a source of contagion that was located outside of household residences. An analysis of typhoid morbidity by sex was unfortunately not possible given that the sex of the patient was not noted in the Patient Register for Saint Mary's Hospital and could not be inferred from the name of the patient, since the researcher agreement



Figure 6. A dog team hauling water for sale in Dawson City. W. D. MacBride, Library and Archives Canada, C-004350.

precluded this information from being transcribed during data collection.

Nevertheless, in addition to the surprising health burden observed for men relative to women, it is intriguing that socioeconomic status proved to be a poor predictor for typhoid fever mortality in the Klondike. While individuals of higher social standing tend to enjoy an advantage relative to their lower status counterparts with regard to reduced morbidity and mortality from infectious diseases, this pattern did not hold true with regard to typhoid fever incidence among the Klondikers. In fact, an analysis of the relationship between socioeconomic status (limited to males over the age of fifteen) and typhoid fever mortality failed to reveal any statistically significant associations in the Yukon during the period of study. Archival sources further support the assertion that no social stratum of gold rush society was more or less affected by typhoid fever. The *Dawson Daily News*, for example, regularly reported all cases of typhoid fever brought to the editors' attention, with almost daily reports making the news during peak seasons. These public notices attest to the fact that the disease indiscriminately struck men from all walks of life—including miners, white-collar professionals, laborers, government clerks, and even members of the North West Mounted Police (who, it might be noted, had their water needs met by a private well located at the barracks facility).

CONTRACTING *S. TYPHI* IN THE KLONDIKE

Taken together, these observations support the interpretation that a domestic source of contagion was unlikely to have been responsible for the rampant spread of typhoid fever in the Klondike. In order for typhoid fever to get a foothold in a community, it requires a population living in close proximity to the source of contagion. Given the size of the epidemic and testimony by government and medical officials to the fact that typhoid fever was being spread by contaminated water consumed within Dawson City, it is unlikely that the stampeders were contracting and transmitting *S. typhi* on such a scale among the scattered mining claims in the gold-field creeks. While it is true that children and women accounted for a smaller proportion of the population than did adult men in this time and place, they nevertheless lived and labored alongside one another. Since no children and only a marginal number of women died from typhoid fever throughout the period of study

(with those cases typically being attributed to an outside source encountered by a male member of the household), it seems unlikely that domestic water consumption played a role in the transmission of *S. typhi* among the Klondikers. That is not to say, however, that water used for domestic purposes was not compromised by the unsanitary situation in Dawson City; but clearly most gold rushers heeded the advice of the medical health officer and made it a practice to boil the water they used at home prior to drinking it. While household water may have been rendered harmless through routine boiling, and although Dawson City's restaurants prided themselves on serving "pure" drinking water to their paying customers, there were other places where male Klondikers in particular might unwittingly come to consume contaminated water. To explain the unusual patterns of differential mortality from typhoid fever observed among the gold rushers, one must simply ask what activity Klondike men were engaging in that (a) excluded their female and child companions, and (b) brought all men into contact with the source of contagion without bias stemming from their socioeconomic standing. The answer is a familiar symbol of the Klondike gold rush (Fig. 7).

THE BUSTLING SALOONS OF DAWSON CITY

Recent research on the Klondike gold rush has refuted earlier literature that popularized misconceptions of Dawson City as a tawdry center for prostitution and debauchery (e.g., Backhouse 1995; Cruikshank 1992; Duncan 2004; Guest 1985; Porsild 1998), but there was no shortage of saloons in the community and "[they] did a thriving business" throughout the gold rush era (CDNC 1898a). Saloons were in fact among the first and best permanent buildings in Dawson City (CDNC 1987) and, according to some, also "the most pretentious" (Ingersol 1897:132). The saloons served as important social institutions and meeting places for all men in the community, as well as providing one of the only sources of entertainment for lonely gold rushers.

Kingsdale (1973) has discussed how the saloon historically functioned as a social institution in remote communities, providing men of all backgrounds with a variety of services extending far beyond simply dispensing liquor. The proprietors of these establishments often served many important functions in boomtowns such as Dawson City, including cashing checks; lending and holding money in safe keeping; introducing potential workers and employees; taking messages and receiving mail for



Figure 7. The Dominion Saloon, Dawson City. National Museum of Canada, Library and Archives Canada, PA-013409.

their regular clientele; hosting business meetings and political assemblages; and serving as the distribution center for news in the community. Meetings of all sorts were held in Dawson's saloons, which further functioned as "a place of general business...[where] pacts were made, with an elbow on the bar, and a jolt of whisky to seal the deal" (LAC 1897–1904), the custom even being a regular habit of government officials who lacked any more appropriate locale in which to conduct their formal business in the early years of the stampede (Berton 1958).

In addition to practical services rendered by the proprietor, a variety of entertainments beyond drinking, dancing, and gambling were also available to customers within these establishments, including recent newspapers for reading, movies, boxing matches, and live performances. Most important, however, was the companionship that many homesick men found in these places. This was especially true in the early days when Dawson City offered little in the way of alternatives.

In those days there were no clubs, no private houses to which one might be invited, no place to which one could invite one's friends.... Instead, even the most respectable single men unwound at the M and N, the North Star, the Aurora, the Monte Carlo, and the Alhambra saloons (Yukon Archives n.d.).

Thus, while men's reasons for visiting these establishments varied, most entered a saloon at least occasionally (and in many cases, habitually), since these establishments "catered to a larger clientele in a greater variety of ways than any other...institution" (Kingsdale 1973:478).

While children were excluded from Dawson's saloons due to laws prohibiting the provision of liquor to children, the skewed ratio of men to women who died from typhoid fever during the period in question was likewise mirrored in the sex ratio of Klondike barrooms, given that respectable women of the Victorian era did not partake in the amusements offered by saloons and dancehalls, even in rustic Dawson City (Highet 2015). While some women were employed as dance-hall girls and "percentage wom-

en,”³ it is important to note that these women typically made it a practice to refrain from consuming the drinks that male patrons proffered. The role of the dance-hall girl was ultimately to entice men to purchase more alcohol than they otherwise would. To this end, Klondike men would buy tokens at the bar, which they could then exchange for whirls around the dance floor with one of the “girls.” Throughout the night the caller announced in endless rounds, “Git your pardners for a cowtillion [*sic*]” and, following a minute of dancing, “Promenade all—to the bar” (Leonard [1897] 1994:136). Each musical selection was intentionally “short and lively so as to make the last call come as frequently as possible” (Leonard 1994:136). When the call to promenade came, men were expected to escort their “girl” to the bar to purchase refreshments. The potential for profit was great both for the proprietors and for the “girls,” who earned 25 cents per dance plus a 25% commission on liquor sales tallied under their tab each night (CDNC 1898b). Given the long hours of operation, the “girls” could expect to endure as many as 150 whirls around the floor each evening. To ensure they made their quota, it was not unheard of for establishments to keep their female employees under a strict contract that forbade them from leaving the premises from the time they arrived at work in the evening until the last call came at five o’clock the following morning (Yukon Archives 1897–1950). The potential to amass a small personal fortune provided sufficient incentive for these women to abide by the grueling hours regulated by the dance halls, which operated six days a week; but in order to withstand the demands this work entailed, few women actually consumed the champagne and whiskey that their companions purchased for them. To maintain their endurance, the “girls” instead quenched their thirst with ginger ale or simply made a show of drinking the whiskey in order to encourage additional sales, the unconsumed libations being switched out through a sleight of hand and subsequently returned to the bottle (Backhouse 1995).

The residents of the Klondike were not oblivious to the fact that men often contracted typhoid fever during their frequent visits to Dawson City’s saloons. Such occurrences were, in fact, publicly reported. The Karlson brothers, for example, were both young men in the prime of life who had been among the first to stake a claim on Bonanza Creek following the discovery of gold in the Klondike. After mining a small sum of gold, they sold their combined interests for \$50,000 and made plans to return home to Norway, having finally found their fortune

in the Americas. Prior to their departure, the brothers decided the momentous occasion warranted celebration. Regrettably, however, “their spree in town left them both ill with typhoid fever and they died shortly afterward” (cited in Porsild 1998:77).

During the heyday of the Klondike gold rush, liquor was a commodity more precious than gold. While the saloons raked in tremendous sums of gold dust, nuggets, and cash each night, “it was [nevertheless] difficult to obtain a good article of liquor at any price” (CDNC 1898a). Dawson City’s alcohol supply rarely satisfied the demand, while wholesale prices frequently reached astronomical heights. During this period, whiskey flowed through the market at a price of \$20 per bottle while champagne traded for as much as \$40 a pint, and shortages of both were frequent at these prices (CDNC 1898b, 1898c). At the bar, whiskey was dispensed at the rate of anywhere between 25 cents to a dollar per glass in 1898, a considerable sum given that an entire meal could be purchased for only five cents at any decent restaurant in the south at this time (CDNC 1898d). Liquor was so highly valued, in fact, that customers were willing to pay outrageous prices and drink just about anything the bartender offered to pour for them. As point in fact, one man had become so enamored with the dance-hall queen Cad Wilson that he ordered a bathtub filled with wine for her to bathe in. Whether or not she actually took the bath is a matter of speculation, but it is said that the frugal barkeep “salvaged, re-bottled and [put the wine back] into circulation” once she was done with it (Berton 1958:385), as the secondhand swill could still fetch a price of \$30 a quart (LAC 1897–1904). Saloon proprietors’ opportunities for profit were therefore substantial, yet they were mitigated by the high cost of stocking their bars. This drain on profits could, however, be diluted if the stock could be made to stretch. In this vein, Archibald has provided testimony that by the end of winter in 1898, “bars had been serving what amounted to whisky-flavoured water” (1981:26). This sentiment was seconded by a newspaper correspondent for the Klondike, who reported:

Whiskey is \$40 per gallon at wholesale. Dawson Saloonists give it considerable medical attention, ‘doctoring’ it with vile ingredients and charging 50 cents per drink. They figure 100 drinks to the gallon, and \$100 receipts from the same original gallon, so the quantity of dilution can easily be figured out (Wells and Dodd 1984:139).

Prior to the introduction of running water in Dawson City (which was first extended into business establishments in 1900), Klondike saloons, like all other places of business, had their water delivered by the various vendors operating within the community or through independent contracts. The quality of the water available on the public market may have been suspect enough to have led customers to continue boiling their water prior to domestic consumption, but there can be no doubt as to the quality of water being sold to businesses, including Dawson City's numerous saloons. As the *Dawson Daily News* publicly decried the situation:

Notwithstanding the fact that the health board has forbidden the taking of water from the Yukon, a string of water carriers can be seen any morning at the various water holes filling their buckets out of the Yukon and delivering same in the various business places around town.... This is criminal and no punishment is too severe for the scoundrels (DDN 1900d).

It seems reasonable to assume that prior to Dawson's saloons being connected to the city's water mains, saloon proprietors would not have required their bartenders to boil water intended for adulteration, since this would have had to be done on the only woodstove in the establishment, which was typically located on prominent display and in full view of customers. After multiple rounds of drinks in an evening, and many subsequent nights spent passing time in Dawson City's saloons, Klondike men would have been at an elevated risk of contracting typhoid fever—especially since the incidence and severity of the infection is dependent upon the amount of bacterium ingested by the individual. In support of this hypothesis, it is worth noting that throughout the period of study not a single person died from typhoid fever whose reported occupation counted them among Dawson City's hospitality or service industry workers (this category being primarily composed of bartenders, servers, and entertainers). A sinister interpretation of this would be to suggest that waitstaff and bartenders were simply aware of the health risks and knew better than to consume the tainted beverages sold in their places of employment.

CONCLUSIONS

It is clear that poor sanitation complicated by physical qualities of the local environment led to a contaminated water supply in Dawson City that was ultimately responsi-

ble for the outbreak of typhoid fever during the early years of the Klondike gold rush. The differential pattern of mortality observed for this disease, however, suggested that some underlying factor was responsible for the disproportionate affliction of male community members, without regard to their socioeconomic standing. Archival research conducted from an historical anthropological perspective has provided the context for interpreting these facts as an important dimension of the social history of typhoid fever in this particular time and place. This approach has revealed a social practice—namely, male stampeders' penchant for making frequent visits to saloons—to have differentially exposed this segment of the population to an unanticipated source of *S. typhi* in their midst.

Throughout our history, humans have been subject to complex relationships with the infectious diseases from which we have suffered. This is particularly evident in the case of ailments such as typhoid fever, since human actions (including aspects of the social life and culture of the local community) can yield dramatic and often unanticipated consequences with regard to exposure to contagion. Since the time of Mary Malone, typhoid fever has served as a classic case study for teaching about the social dimensions of infectious disease transmission, with some studies even pointing to public gatherings as prime settings for facilitating the transmission of *S. typhi* among attendees (e.g., Coté et al. 1995). This research is therefore not the first to document the spread of *S. typhi* among partygoers and revelers, but it has provided an interesting historical case that may, in fact, offer the first documented link between typhoid fever and the consumption of adulterated liquor.

NOTES

1. Menus for local eating establishments were regularly published in the *Dawson Daily News*. These listed the prices of various foods as well as any specialty items or delicacies that the entrepreneur had to offer.
2. Belinda Mulroney's Hygenia Water Company ran an advertisement with this claim in the *Dawson Daily News* on September 13, 1899, Yukon Archives, Whitehorse, Yukon.
3. "Percentage women" were dance-hall "girls" who earned a commission on drinks that they sold at the dance hall each evening.

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