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Owen Temby et Joshua MacFadyen

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Résumé de l'article

À la fin des années 1920 et au début des années 1930, l'air de Montréal était noirci par la combustion du charbon des maisons et usines ainsi que par celle des locomotives et navires, qui reliaient son économie, en pleine croissance, à celle du reste du Canada. Devant l'absence d'instruments de règlementation permettant de faire face à cette nuisance, le gouvernement municipal a voté le premier règlement moderne sur la fumée du pays, lequel consistait en une norme quantifiable d'émissions, un bureau du contrôle des fumées et des exigences quant à l'installation et l'utilisation de la technologie pour réduire les émissions. Grâce à une présentation du processus par lequel la nuisance de la fumée de Montréal a été prise en charge, cet article décrit le rôle de la coalition locale de croissance la plus influente de la ville (le « Montreal Board of Trade ») dans la mise du problème à l'agenda de la ville, dans la participation à la formulation d'une réponse de politique publique et dans le suivi de la mise en oeuvre de la règlementation résultante. Le « Board of Trade » a cherché une résolution du problème parce que ce dernier avait des conséquences néfastes pour la réputation de la ville et le climat des affaires. À l'instar d'autres recherches concernant la diminution de fumée dans les grandes zones urbaines, la réponse promue par cette coalition élite de croissance consistait largement en mesures basées sur la technologie qui traitaient le problème tout en évitant le recours à des mesures qui auraient affecté l'activité économique.

Urban Elites, Energy, and Smoke Policy in Montreal during the Interwar Period

Owen Temby and Joshua MacFadyen

During the late 1920s and early 1930s, Montreal's air was blackened by smoke from coal-burning homes, factories, and the locomotives and lake freighters connecting its growing economy to the rest of Canada. Lacking regulatory tools suited to the task of abating this nuisance, the municipal government passed the country's first modern smoke bylaw, consisting of an objective emissions standard, a smoke control bureau, and requirements for the installation and utilization of technology to lessen emissions. In providing an account of the process through which Montreal's smoke nuisance was addressed, this article describes the role of the city's most influential local growth coalition, the Montreal Board of Trade, in introducing the issue on the city's policy agenda, participating in the formulation of a policy response, and monitoring the implementation of the resulting bylaw. The Board of Trade sought a resolution to the problem because it damaged the city's reputation and business climate. Consistent with other documented examples of smoke abatement in large urban areas, the response promoted by this elite growth coalition consisted largely of technology-based measures that managed the problem while eschewing recourse to measures that would dampen economic activity.

À la fin des années 1920 et au début des années 1930, l'air de Montréal était noirci par la combustion du charbon des maisons et usines ainsi que par celle des locomotives et navires, qui reliaient son économie, en pleine croissance, à celle du reste du Canada. Devant l'absence d'instruments de règlementation permettant de faire face à cette nuisance, le gouvernement municipal a voté le premier règlement moderne sur la fumée du pays, lequel consistait en une norme quantifiable d'émissions, un bureau du contrôle des fumées et des exigences quant à l'installation et l'utilisation de la technologie pour réduire les émissions. Grâce à une présentation du processus par lequel la nuisance de la fumée de Montréal a été prise en charge, cet article décrit le rôle de la coalition locale de croissance la plus influente de la ville (le « Montreal Board of Trade ») dans la mise du problème à l'agenda de la ville, dans la participation à la formulation d'une réponse de politique publique et dans le suivi de la mise en œuvre de la règlementation résultante. Le « Board of Trade » a cherché une résolution du problème parce que ce dernier avait des conséquences néfastes pour la réputation de la ville et le climat des affaires. À l'instar d'autres recherches concernant la diminution de fumée dans les grandes zones urbaines, la réponse promue par cette coalition élite de croissance consistait largement en mesures basées sur la technologie qui traitaient le problème tout en évitant le recours à des mesures qui auraient affecté l'activité économique.

Introduction

In February 1931, Montreal became the first Canadian city to pass a modern smoke bylaw with an objective emissions standard and a staffed department to enforce it. The city was experiencing a substantial problem caused by the use of coal in factories, apartment complexes, and industrial shipping, exacerbated by the overtaxing of industrial boilers characteristic of rapidly growing businesses in a rapidly growing city. The city's most powerful local growth coalition, the anglophone Montreal Board of Trade, was afraid this problem would harm the city's reputation. Thus, in 1927 the Montreal Board of Trade brought the issue up with the city council, produced a report of what other jurisdictions were doing, and asked for stricter enforcement of the existing bylaw. When, shortly thereafter, it became clear to city officials that the forty-six-year-old bylaw was ineffective, they created a committee of prominent urban elites and engineers to develop a solution. This citizens committee sprang into action in February 1929, drafting the bylaw and educating building owners about how to operate their energy-producing coal boilers so that they would produce less smoke. The powerful national shipping industry participated in this committee too, and was able to secure an exemption for locomotives and lake freighters. Nevertheless, the bylaw was a substantial improvement on what had previously existed. The citizens committee submitted the bylaw to the city government in September 1929 and, after a protracted delay due to legal technicalities and the election of a new city council, it was made law in February 1931.

As we show below, the facts of the story fit a general pattern observed by other recent studies of air pollution history about the dominant role of local elites and growth coalitions in lobbying for and formulating clean air policy. This includes Ted Moore's research on the Salt Lake Women's Chamber of

Commerce and air pollution activism during the interwar period, and George Gonzalez's research on a diversity of local elites pushing for air pollution abatement in Chicago at the turn of the twentieth century and Los Angeles during the 1940s and 1950s.[1] Recent studies by Owen Temby have shown this occurring with respect to Toronto's smog problem in the 1950s and Ontario's acid rain problem in the 1970s and 1980s.[2] Temby has consciously nested his analysis within the "urban regime theory" approach, underscoring both the powerful influence of what Harvey Molotch calls "real estate interests" in promoting local growth, and the importance of growth coalitions in mediating between conflicting local interests.[3] The crux of this analysis is that in Canada, as in the United States, the important people to have historically made clean air policy are the powerful local growth interests, and the policy outcomes typically represent a compromise between them and the heavy industrial interests located within the urban area but more concerned with the growth of the larger-scale market for their goods.

A particularly illuminating explanation for this pattern has been provided by George Gonzalez in *The Politics of Air Pollution*. Gonzalez shows that these activities of local growth coalitions are explained by specific characteristics of capitalism's operation in the urban milieu, namely, that clean air is necessary for the realization of profit through the use and sale of land. Urban elites attempt to secure clean air as a condition of economic prosperity, so long as pollution abatement policy does not dampen economic growth. Furthermore, Gonzalez's explanation of the behaviour of urban elites in lobbying for and formulating clean air policy also clarifies why they tend to prefer technology-based solutions. Technology is important when it enables economical solutions to pollution problems, forestalling recourse to measures ostensibly hampering economic activity (like factory shutdowns). In formulating clean air policy, locally oriented elites seek technology-based measures to facilitate economic expansion.[4] As Gonzalez shows in a case study of Chicago's air pollution program at the turn of the nineteenth century, they are reluctant to advocate other types of controls, even in the absence of available economical technology.

In this article we seek to test these findings through a case study of Montreal's 1931 smoke bylaw. As we show, the Board of Trade introduced the issue on the public agenda, contributed to the formulation of policy when an initial effort to address the nuisance based on the existing bylaw was unsuccessful, and followed up on its actions by monitoring the new bylaw's implementation. While the bylaw is important because it was the first in Canada to establish a municipal smoke department and objective smoke standards, also notable is its reliance on technology (in this instance, modern boilers, properly installed) to bring about smoke abatement. Before providing an account of the Board of Trade's smoke-fighting activities, we begin with an overview of the problem in Montreal, followed by a description of the Board of Trade and the scope of its membership and activities.

The Problem of Air Pollution in Montreal

Using the framework of "urban metabolism," historians have argued that cities convert energy in ways similar to natural organisms, constantly striving for more efficient use of energy and other resources.[5] Canada is an energy-rich country and, for much of its history, Montreal was Canada's furnace. The country's actual blast furnaces were located elsewhere—for example St. Maurice, Hamilton, and Sault St. Marie—but from an urban metabolic perspective, Montreal converted more energy to useful forms than most other cities in North America. Feed powered its livestock. Food powered its workers. Other fuels from an increasingly vast supply chain powered its houses, factories, and railroads. Montreal also converted materials to pollution, and environmental historians have argued that metabolic studies should include an examination of these undesirable or nuisance outputs as well as a city's useful goods and services.[6] Throughout its periods of explosive growth and industrialization Montreal attempted to mitigate the effects of its pollution, particularly in areas where it tarnished the city's ability to attract new visitors and new business.

Part of Montreal's success was its ability to harness extensive energy stocks and flows, and the St. Lawrence River was the reins that guided this system. Montreal was situated on the edge of a seemingly endless boreal, Laurentian, and Acadian forest ecosystem. These forests provided materials for trade as well as energy for life and manufacturing in the city. However, by the late nineteenth century land use pressures in the Montreal Plain meant that many of the nearby farm woodlots were so small that they could no longer supply fuel for farm or urban markets. New energy developments such as peat mining were promoted by local elites in the 1890s, and this fuel briefly seemed as if it would replace wood in places where forests dwindled.[7] Most of the country's earliest and most successful peat mines appeared in the Lower St. Lawrence valley, and Montreal companies such as the Canada Peat Fuel Company were built to supply the city.[8] Peat production ultimately failed to fill the demand, but it demonstrates that Montreal's elite always had interests in the city's fuel pipeline.

By the interwar period, the problems of localized shortages in wood and the instability of peat production had been amply addressed by the early twentieth century's foremost energy source, coal. Quebec and Ontario had no accessible coal mines, but Nova Scotia coal deposits were available from within the dominion, and extensive American coal was available from Pennsylvania.[9] About one-fifth of the coal burned in Central Canadian factories was consumed in the Montreal area in this period and another fifth in Toronto. But whereas Toronto's bituminous coal was virtually all imported from the United States, Nova Scotia supplied 722,000 tons, or three-quarters, of Montreal's. Ottawa and Quebec City industries also consumed Nova Scotia coal, but in much lower amounts at 202,000 and 160,000 tons, respectively.[10] The primary energy consumer was industry.

Montreal during the late 1920s and early 1930s was Canada's largest city and had a diversified economy that served as one of Canada's major manufacturing hubs. A 1931 industrial survey of Montreal, commissioned by the Board of Trade, reported that manufacturing employed "nearly one-third of the city's workers, as many as trade, finance and transportation combined."[11] Fifteen types of products accounted for 55 per cent of the manufactured goods by value, with each type valued at more than $10 million per year. These included locomotives and railroad cars, cigars and cigarettes, flour, meatpacking, men's and women's clothing, cotton textiles, and electrical apparatuses. The industrial survey also highlighted the features of Montreal that made it attractive to these businesses: "Montreal owes its place in Canadian manufacturing to (1) its geographical location, providing ocean, river, lake and rail transportation; cheap hydro-electric power; a plentiful supply of cheap, intelligent, tractable labor; large, growing, domestic market; and abundant good water at low cost; (2) extensive factory sites admirably suited to a variety of industries; (3) favorable political and financial conditions; and (4) momentum of early start."[12]

However, these manufacturing industries, and the industrial lake and rail transportation to which they owed much of their decision to locate in Montreal, caused substantial smoke problems. In his 1897 sociological study, *The City below the Hill*, philanthropist Herbert Ames famously described the lower districts of Griffintown and Point-Saint-Charles as hidden by the smoke from Montreal's industrial and railway operations.[13] The problem worsened over the next three decades. In December 1929, Ernest Pitt, a prominent real estate broker and recent president of the Montreal Real Estate Board (a subunit of the Montreal Board of Trade) wrote about the smoke problem in the Montreal-based *Canadian Jewish Chronicle*.[14] He noted its deleterious effects on both public health and buildings:

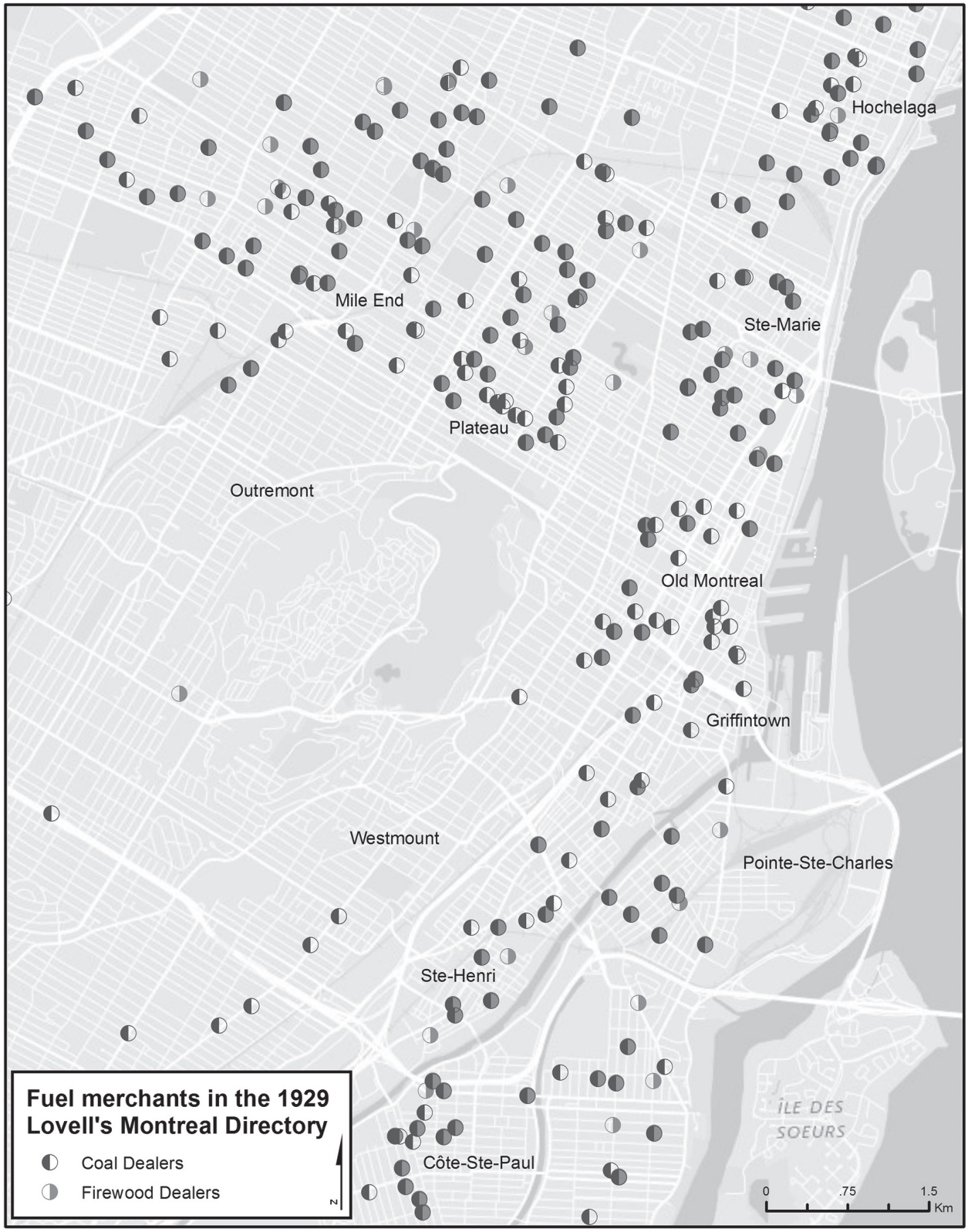
> Anyone who will take the trouble to climb Mount Royal any bright sunny day, preferably a week day, and look down towards the residential quarters of the city will realize the damage that is being suffered by those districts through smoke … The danger is not only to public health, although that is a most important factor; there is also the unsightliness of public buildings, churches, cathedrals, monuments, all blackened, almost beyond hope of renovation, by smoke and soot; the expense of continual painting and cleaning the walls and the waste of valuable energy represented in the unburned coal which goes up a thousand chimneys in the form of smoke. What good is it, for instance, for up to date home and apartment builders to insert quartz vita glass panes into the windows of living rooms and nurseries, so as to give the residents the fullest benefit of the maximum sunlight if the sun's rays have to penetrate through a dense cloud of smoke before they reach the homes.[15]

The smoke problem in Montreal actually consisted of three relatively distinct energy geographies. By 1929, manufacturing was entrenched in the core districts and it had recently expanded into the uptown areas of the Plateau and Mile-End.[16] Coal-fired rail and steamship service continued to belch smoke into the basin in Lachine and along the waterfront.[17] And the early twentieth century expansion of the city into uptown residential areas was well serviced by coal and wood dealers (see map 1). Robert Lewis has argued that the city's development after the First World War was haphazard, and residential neighbourhoods often grew in tandem with heavily polluting industrial districts. Rather than a "coherently or systematically planned process," Montreal's industrial geography was determined by locational assets such as "infrastructure, factory land and housing."[18]

All three districts produced smoke and other forms of air pollution from the consumption of solid fuels. For instance, over a hundred firms sold coal in the Plateau and the Mile-End districts in 1929. The main coal used in residences was anthracite, the cleanest and most energy intensive of the solid fossil fuels. The Montreal area consumed an average of 1.5 million short tons of anthracite in the five years from 1926 to 1930. The city spoke for between half and two-thirds of that, depending on the year, and unlike other Central Canadian cities who sourced their anthracite from the northern United States, virtually all (85 per cent in 1930) of Montreal's was imported from the United Kingdom.[19]

In addition to anthracite, the city's industrial plants consumed enormous quantities of bituminous or soft coal. Bituminous coal is a higher polluting fuel than anthracite, emitting much larger quantities of smoke and particulate matter per unit of energy produced. In the same 1926–30 period, the Montreal area imported 1.2 million short tons per year, and the city spoke for around 700,000 tons of those shipments. However, Canada had its own domestic source for this dirty fuel—the Nova Scotia coal fields—and we estimate that Canadian mines accounted for an additional 1.4 million tons of bituminous coal consumed in Montreal alone. Thus, in 1929 the city consumed a combined total of 2.7 million tons (2.5 metric tonnes) of all types of coal from various sources.

In terms of the air pollution produced by the city's stoves and furnaces, we can quantify the worst forms through the annual amount of particulate matter (PM) emitted by each type of fuel in early burning technologies. PM is measured in PM_{10} and $PM_{2.5}$, but Montrealers would have simply recognized, and inhaled, it as smoke. By using the emission factors of the U.S. Environmental Protection Agency (EPA), we estimate that the total airborne PM from 2.5 million tonnes of anthracite and bituminous was 97,700 tonnes. More importantly the $PM_{2.5}$, or the fine particles that have become the standard for measuring dangerous air pollution, equalled 23,447 tonnes emitted from all coal types in 1929. These estimates include the stack or controlled emissions, as well as the fugitive emissions derived from shipping and handling all types of coal. We used the EPA emission factors for stoker-fired boilers, the most inefficient modern coal burners in use today. The emissions from interwar period boilers would have been even higher.[20] The data suggest that Montreal had approached international levels of air pollution in the 1920s from the consumption of coal alone. Many other



Map 1: The location of coal and wood dealers in Montreal, 1929
Source: Map created by the authors using the addresses of dealers listed in the 1929 Montreal business directory. John Lovell, Lovell's Montreal Directory, 1929–1930 *(Montreal: John Lovell & Sons, 1929).*

sources contribute to PM emissions, including nearby forest fires and urban conflagrations, but when the Board of Trade determined to tackle the city's smoke problem, its primary target was coal-powered industry.

Like most other northern cities, Montreal imported coal from distant mines, but in a country with such extensive forests, urban energy systems also included a great deal of wood. Coal was king, but biomass energy had not yet been completely displaced by the fossil fuel. Seventy-eight of the Plateau and Mile-End coal dealers also sold some amount of firewood in 1929, and another dozen operations dealt exclusively in wood (see map 1). The Province of Quebec was a prodigious wood consumer. In 1931, Quebec farmers reporting their firewood to the Census of Agriculture indicated a very high consumption rate of 24.4 cords per household. We know that 26,000 Montreal dwellings burned wood as their principal heating fuel in 1941, and if we apply the same ratio (13.1 per cent) to the city's dwellings in 1931 we can safely estimate that at least 22,442 Montreal dwellings were heated with wood. Still others would have consumed wood as cooking and secondary heating fuels. Using a consumption rate of three-quarters of the rural rate, Montreal would have consumed nearly 411,000 cords (465,713 tonnes) of wood.[21] The EPA emissions factors suggest that this would have produced an additional 7,125 tonnes of PM_{10} or 6,613 tonnes of $PM_{2.5}$ every year.[22]

The smoke abatement action in Montreal was in direct response to the use of dirty bituminous coal in industrial factories. However, federal energy policies in the interwar period meant that a river of bituminous coal entered the city at subsidized rates. Three quarters of the city's bituminous coal came from Nova Scotia, and between half and two-thirds of that coal found a market only because of federal subventions. Thanks to these subsidies, and its location on the St. Lawrence, Montreal's factories spoke for 45 per cent of the bituminous coal produced in Nova Scotia each year.[23] When local elites protested the smoke problem caused in large part by the city's bituminous coal habit, it protested a practice its own federal government had created.

Local Elites and Governance in Montreal

During this period the Montreal Board of Trade was the largest and most influential business association in the city.[24] Quebec historians Paul-André Linteau, René Durocher, and Jean-Claude Robert describe it as the dominant economic interest group in the city, "the voice of Montreal's big and middle bourgeoisie."[25] Contemporaneous attestations of the Board of Trade's importance in developing policy can be found in the editorial pages of Montreal's newspapers. For example, after the organization's January 1929 annual meeting, the *Montreal Gazette* wrote this tribute:

> Largely representative of the business interests of Montreal, which are the greatest in all Canada, the Montreal Board of Trade occupies a position of exceptional responsibility and influence, and its activities are of practical concern, not to the commercial metropolis only, but to all those other Canadian communities which look to Montreal for leadership in matters of finance and trade. In exercising this influence, the board is, and has always been, deeply mindful of its responsibility, and when it presents a recommendation dealing with any outstanding public question, it does so only after the most thorough investigation and with the aid of dependable expert advice.[26]

The Board of Trade consisted of nearly a thousand members of the city's English-speaking business elite representing a diversity of firms, including banks, insurance companies, natural resource extraction and processing firms, building companies, manufacturers, and retail stores.[27] At the head of the organization was its council, consisting of nineteen members elected to one-year terms. Members in executive roles (e.g., president, secretary, treasurer) were also elected to one-year terms, with changes occurring at the annual members meeting at the end of January or beginning of February. Council members also served on standing committees on broad issues of importance to the organization.

The Board of Trade's president in 1927, when the response to the smoke issue initiated, was Gifford Laffoley, an executive at the Montreal branch of the British textiles firm Mark Fisher Sons & Company. In a 7 June 1927 speech to new Board of Trade members, president Laffoley made several statements about the organization's scope and purpose: "I cannot refrain from calling your attention especially to the fact that the Board is essentially a business organization. At present time I think there are only two lawyers [as] members of the Board, and they were admitted to membership, not as lawyers, but as business men interested directly in the control of business corporations."[28]

He added that the Board of Trade was "designed to conserve and protect primarily the business interests of this City and of the country" from the "new embarrassments" that each year face the business community. Laffoley also highlighted the Board of Trade's role as an arbiter of internal squabbling among business elites, noting that the organization "has always refused to support sectional interest as against national interest." While this is a typical feature of urban growth coalitions during the first six decades of the twentieth century, Laffoley's recognition of Montreal as Canada's most cosmopolitan and economically dynamic city suggested a wider scope for the organization's purview: "Let it be said that what the Board of Trade of Montreal thinks and decides today—will be adopted by Canada tomorrow."[29]

Consistent with Gonzalez's observation (discussed above) that local growth coalitions manage the pathologies associated with growth, such as air pollution, to shape the city as a place conducive to growth, the Board of Trade involved itself with formulating policy aimed at this end. One particularly instructive instance was its response to a late March 1927 outbreak of typhoid caused by impure milk from two local distribution

facilities, killing about five hundred people and causing more than five thousand to become ill. The Board of Trade Council's Municipal Affairs Committee investigated this incident and sent a report, outlining the facts and proposing a policy response, to the other members of the Board of Trade Council on 6 April 1927. It said that, in urging the city to address this issue, "the Council should stress not only the loss of life and suffering brought about by the present Epidemic, but also the enormous financial loss not only to this City by the reduction in tourist traffic certain to follow by the knowledge of the prevalence of typhoid fever here."[30] Laffoley later echoed this concern in his 31 January 1928 outgoing presidential address and underscored the Board of Trade's resolve to manage issues such as this:

> During the past year your Council took a firm stand on the Typhoid question; it was appalling the apathy and the failure to realize the seriousness of the situation which was displayed in official quarters during that period. Due largely to the splendid work done by Dr. Boucher and his too small staff, and also to the work of a well known Cabinet Minister, the situation was got in hand, but not before hundreds of lives were lost. Montreal was held up as an undesirable place to visit, and the financial damage cannot be estimated. I feel very strongly about this. "THIS MUST NEVER HAPPEN AGAIN."[31]

Other areas of concern for the Board of Trade from 1927 to 1931, as highlighted in their annual reports, included urban transportation infrastructure, the need for better juvenile courts, provincial workers' compensation policy, daylight-saving time adoption, and shoreline development.[32] In Laffoley's 31 January 1928 address, he brought up the question of the Board of Trade's issue scope by highlighting the organization's expansive understanding of the activities relevant to economic growth:

> I have been reproached personally and in the Press because the Council this year has considered questions which were thought not to be in its province—and that it was not the "business" of a Board of Trade to go into certain matters; I shall have none of this. Long ago the word "business" was used by one who went about his father's business. Is the health of the City good business? Is the conservation of our natural resources good business? Is the improvement of our Harbour good business? Is the bringing in of healthy immigrants good business? Is the retention of our native born good business? Is the solving of our transportation problem good business? Is taxation fairly imposed and efficiently collected good business? Then my message to you is—"Whatsoever things are good—Work for these things."[33]

Local Elites Address Air Pollution

Consistent with the Board of Trade's concern for managing the "embarrassments" that potentially damage Montreal's reputation, the Board of Trade led the effort to address the smoke nuisance. The Board of Trade's importance in this policy issue can hardly be overstated. Every available correspondence in the Archives Municipales de Montréal's city council file on smoke abatement from 1927 to 1931 calling for or reporting on smoke abatement is with the Board of Trade (with the exception of a few letters of correspondence with a polluting organization). The contemporaneous newspaper articles on the smoke nuisance clearly point to the Board of Trade's dominant role.

The city government did, however, correspond with the Montreal Local Council of Women (MLCW, an elite anglophone organization) about the city's smoke problem. This is particularly interesting because of the central role Gonzalez and Moore separately assign to elite women's groups in addressing smoke problems in other cities. And while Gonzalez describes Los Angeles's Stamp Out Smog as a manifestation of elite concern for the deleterious effects of air pollution on local growth, Moore ascribes different motivations to the Salt Lake Women's Chamber of Commerce (e.g., greater local autonomy).[34] Finding that the MLCW played an important role in the city's smoke abatement policy-making would present an opportunity to further explore this type of activism.

However, the MLCW's correspondence with city hall is the exception that proves the rule about the Board of Trade's dominance in the process. Although the MLCW was concerned with many pressing issues facing the city (notable among them, the 1927 typhoid disaster), it makes no mention of the smoke nuisance in any of its annual reports or extensive meeting minutes during the 1920s.[35] Furthermore, the MLCW had no representative on the inclusive citizens committee for smoke abatement discussed below. Its correspondence with city hall stemmed from a May 1930 request by the Toronto Local Council of Women for information on Montreal's policies. Having no knowledge of them, MLCW vice-president S.R.W. Allen wrote to city hall on 12 July 1930, seeking information on the policies in place to address smoke in Montreal. The city's director of services, Jules Crépeau, replied, explaining that this issue had received substantial attention in recent years and providing an up-to-date overview of the status of the new bylaw. Allen then wrote to the Toronto organization about the forthcoming bylaw, restating the recent events reported in Crépeau's letter, and asserting, "I am given to understand … it is expected this proposed by-law will be adopted in the near future."[36] Thus, unlike the findings of other scholarly accounts of air pollution abatement activism, women's groups were not involved in Montreal. The Board of Trade's influence derived instead from its influential membership and ties to the city's businesses.

By the late 1920s, Montreal was managed by an executive committee of city council, whose members were chosen by the city council. The mayor (Médéric Martin, 1926–8, and Camillien Houde, afterwards), served a symbolically potent yet mostly ceremonial role.[37] As we explain below, the Board of Trade initially raised the issue on the public agenda by contacting the city executive committee and mayor and releasing a report, participated in the formulation of a policy response, and followed up with the city government on the resulting bylaw's implementation. However, at the policy formulation phase, other

(non-local) interests also participated, resulting in the federally regulated shipping industry's successful evasion of new emissions standards.

Setting the Agenda

Although the Board of Trade had requested assistance from city hall in addressing the smoke nuisance a generation earlier, in 1906, the events leading to the 1931 bylaw began in 1926. The Board of Trade's minute book, dated 17 March 1926, reported that the organization's executive council observed the worsening of the smoke nuisance in recent years, and "decided to call the attention of the civic authorities to the physical discomfort and monetary loss involved by the unrestricted production of smoke, and to ask that steps be taken to minimize this evil as much as possible."[38] No immediate action was taken at the time, however, and in early February 1927 the Board of Trade's executive council again decided to contact the city government.[39] On 12 February 1927, the Board of Trade sent letters to both Mayor Martin and the city council executive committee, initiating the smoke nuisance as a political issue. In the letter, the Board of Trade noted the worsening nature of the problem, urged "that a serious study be made of the situation, and thereafter effective action taken," and pledged its assistance in devising a solution.[40] The mayor wrote back two days later promising to take the issue up with the city council.[41] On 18 February 1927, in response to the Board of Trade letter, the city council executive committee passed a resolution "de donner instructions au directeur du Service des Travaux publics de prendre les procédures nécessaires contre les personnes ou compagnes qui enfreindront les règlements concernant la fumée, de voir à ce que ces causes procèdent avec célérité et no soient pas remises, et de faire rapport au Comité toutes les semaines sur ces causes ainsi que sur le résultat obtenu."[42] Thus, the city council's initial response to the Board of Trade's request was to order the municipal government to enforce the existing smoke bylaw more stringently.

However, during the 9 February 1927 Board of Trade meeting, President Laffoley also volunteered to interview "civic authorities" about devising a solution in the form of a new municipal bylaw.[43] By the end of March, among those contacted were several engineering professors at McGill University and representatives of local firms, including General Combustion Company and Wabaso Cotton Company.[44] Letters from these experts explained potential ways of reducing the smoke nuisance and were used by a special smoke abatement committee formed early April 1927 within the Board of Trade, consisting of Walter Molson, Norman J. Dawes, and Andrew Fleming, "to consider and report on the possibility of the abatement of the smoke nuisance."[45] The members of this committee represented a cross-section of Montreal's polluting and pollution-suffering businesses.[46] Walter Molson, like Ernest Pitt, owned a real estate and insurance firm (Walter Molson & Company) and served on the Montreal Real Estate Board of the Board of Trade. He was a member of the Real Estate Board's executive committee and chaired its city planning committee. Dawes was a brewer and president of the National Breweries Limited, at the time Quebec's largest brewery.[47] Fleming was the vice-president of Hartt and Adair Coal Company, one of Montreal's largest wholesale and retail coal firms benefitting from its bituminous coal habit.[48]

The report was delivered to the Board of Trade council on 12 October 1927 and forwarded to the city government two weeks later.[49] It represented a "big picture" attempt to frame the issue and, as such, contained several elements. First, it defined the nature of the problem, spelling out the physical properties of smoke and identifying its economic and health costs. It noted that smoke "causes heavy loss in the deterioration of fabrics and other goods and by a vast amount of time wasted in keeping premises clean," and it reported an annual economic loss from smoke of $15.5 million in St. Louis and $40 million in Chicago.[50] Second, it identified the sources of Montreal's smoke problem. Blamed were "railways, steamships, factories—large and small, office buildings, apartments, houses—large and small, and private residences." The common troublesome feature of all of these sources is that they all burned some form of coal. Railways, they predicted, would eventually electrify. While the report contended that private residences could reduce their smoke emissions by switching from coal to coke (like anthracite, a less-polluting solid fuel derived from coal), the authors considered apartment buildings, office buildings, and small industrial plants as "the most difficult section to cope with," even though these consumers could conceivably switch to cleaner fuels too. Third, the report pointed to deficiencies in the existing bylaw and underscored the need for ordinances that go beyond controlling dense black smoke. It also weighed some costs of implementing new bylaws, specifically the disproportionate effects that bylaw enforcement would have on small manufacturers who are less able to invest in abatement technology or pay expert boiler-room staff. Fourth, it provided information on the regulatory experiences of other cities dealing with a similar problem. Although the report highlighted the tendency of cities to attempt educational efforts to inform polluters about how to pollute less, it noted that they also amended bylaws "so that they became readily enforceable and any infractions thereof made punishable with heavy fines." The report concluded by urging the city to make smoke prevention "a leading consideration when issuing building permits" (e.g., factories, power plants, and other stationary sources), and emphasized the need for a public awareness campaign so that polluters would know how to lessen emissions. Overall, while the report defined and identified the sources and costs of the nuisance and called for action, it was a tentative (albeit important) step toward an effective suite of measures. It lacked specificity that would be used for practical efforts by the city government to bring about smoke reductions.

The Board of Trade report nevertheless received considerable public attention, including a lengthy article in the *Montreal*

Gazette the following day reporting its conclusions.[51] It also appears to have influenced the city council to obtain information about the specific measures possible to reduce pollution in Montreal. Fewer than two months after formally acknowledging receipt of the Board of Trade's report, on 28 December 1927, city council's executive committee passed a resolution: "De donner instructions au directeur du Service des Travaux publics de faire rapport au Comité, le plus tôt possible, sur les moyens a prendre pour faire cesser la nuisance causée par la fumée."[52]

The city government took action against polluters the following year, in 1928. It sent out roughly 900 notices to smoke-producing plants, yet was able to prosecute in only fifteen cases because the ineffective existing 1882 bylaw (no. 130, "Règlement pour faire disparaître nuisance de la fumée") placed an insurmountable burden on the city.[53] Bylaw no. 130 contained no objective emissions standards and, as such, required that affected parties prove damages by participating in the prosecution process, which the vast majority refused.[54] In April 1928 the city council even took the aggressive measure of passing a resolution directed at the city's largest school boards, stating that it would no longer tolerate the smoke rising from their schools' chimneys, and requiring them to take the necessary measures to reduce these emissions.[55] This appears to have been resolved amicably. However, by the end of the year it was clear that the city government lacked both the regulatory tools and the necessary knowledge of potential solutions to respond effectively.

Formulating a Response

The smoke nuisance issue reappeared in February 1929, when the city director of public works formed a smoke abatement "citizens committee" to develop solutions for the problem and requested that the Board of Trade appoint members. Walter Molson and Norman J. Dawes, co-authors of the October 1927 Board of Trade report, were appointed and attended its first meeting on 14 February 1929 at Montreal's city hall.[56]

Roughly fifty invitees (including at least twelve Board of Trade members) attended the citizens committee meeting, among them representatives from heavy industrial firms, trade associations, and philanthropic organizations, as well as city engineers, aldermen, and university faculty.[57] Chairman of the committee was city council head Alderman Léon Trépanier. Numerous causes and potential solutions to the smoke nuisance were presented, and the tentative consensus appears to have been that the city's rapid expansion had led to the inefficient operation of industrial boilers used in buildings beyond their intended capacity.[58] Locomotives and steamships were also identified as major contributors. Molson and Dawes both spoke at the event, reiterating the findings of their report, including the need for public engagement on the issue, and outlining the nature of the problem. Molson stated that the next step needed to be a survey of the conditions of the city so that a greater knowledge of the problem would be available to use as a basis for decisions. He warned that this would be expensive. The city's chief engineer, H.A. Terreault, also spoke of the need for more information on the problem to serve as a basis for a bylaw. Trépanier responded to Molson's specific point about cost by saying that the city would undertake his recommendation at any expense.[59]

Several attendees spoke in favour of a subcommittee to conduct the technical work of examining the problem locally. In addition to Trépanier and Terreault, this included Board of Trade member A.W. McMaster of the Dominion Coal Company. This eleven-member subcommittee was thus formed, with E.A. Cunningham of the Canadian Railway Club and the Canadian Pacific Railway as its chairman, and several business firms and technical experts as members.[60] As the subcommittee membership was decided at the meeting, Molson initially declined requests to participate, because he felt that technical experts would better undertake the committee's work. However, Cunningham insisted that the Board of Trade be represented. Molson finally acquiesced and joined, declaring that although he could not aid much in the technical work, he would support the subcommittee by educating the public about the problem.[61] Molson and Dawes reported to the Board of Trade Council the following week that "excellent progress was made at the meeting" in addressing the smoke nuisance.[62]

Rather than merely conduct a survey of the smoke problem, the eleven-member subcommittee quickly took substantive measures to address the nuisance. As explained in a report delivered to the full citizens committee in early June 1929, it undertook two main activities. First, it sent letters to "all users of boilers and heating plants" requesting cooperation in addressing the nuisance, described as "at once destructive to health, damaging to property, and an eyesore to the community."[63] Included with the letter was a list of instructions that coal users could employ to prevent smoke and a questionnaire aimed at gathering information for the city's future efforts. The goal of the letter campaign, as stated in the report, was to obtain emissions reductions voluntarily before the forthcoming bylaw required them. The subcommittee reported that "the response to improve the situation has been spontaneous and it was resolved to follow up those who had not replied in order to secure correction by co-operative means."[64] Several polluters who had taken measures to address the problem were listed in the report, including the two national rail companies and the Montreal General Hospital.

Second, the subcommittee drafted the new bylaw. It held a 30 April 1929 meeting at Montreal City Hall to discuss it and the progress of the letter campaign, and then sent the draft bylaw to the full citizens committee for further discussion.[65] Fifteen members of the citizens committee attended the subsequent 4 June 1929 meeting. In it they read, debated, and marked up the bylaw clause by clause, drafting new sections when deemed necessary. The most significant features of the draft bylaw were

the establishment of (1) an administrative architecture to inspect coal boilers and enforce bylaw compliance, (2) objective emissions standards setting an allowable level of smoke measured by observable density, and (3) a requirement that new boilers in buildings be approved and follow detailed installation guidelines.[66] The last component of the bylaw is significant because it underscores the fact that the bylaw's writers envisioned a technical solution to the nuisance. For the administrative portion of the bylaw, it proposed the establishment of a smoke inspection division, within the Department of Works, supervised by a smoke inspector. A permanent smoke abatement commission, composed of eleven members of the public, would advise the director of public works on the structure and activities of the new office, and an advisory board of three mechanical engineers would advise the commission on technical issues when needed.[67]

It was also at this meeting that the main compromise between the locally oriented and national economic interests would be settled. Like the smoke bylaws emerging in American cities, it proposed using the U.S. Bureau of Mines Ringelmann chart to assess smoke density. Discussions during the 4 June 1929 meeting centred on whether the Ringelmann-based standards should apply to small private residences, the duration of the grace period granted to plant owners found in violation of the bylaw, and, of particular significance, the concordance of the standards for locomotives with federal standards.[68] The proposed emissions standard decided by the end of the meeting was that smoke would be considered dense when equal to or greater than no. 3 on the Ringelmann chart, and no source would be permitted to emit dense smoke for more than two minutes out of fifteen. However, E.A. Cunningham had pointed out that this standard conflicted with the one specified in the federal Railway Act regulating the large national railway companies. Since the Railway Act would prevail in the event of a conflict of the two, he claimed, it was necessary to alter the bylaw to align the two standards. Thus, the exception determined and written into the draft bylaw at the 4 June 1929 meeting was that the cut-off for locomotive and steamship smoke would be six minutes of dense smoke out of sixty, a more generous standard than that for buildings.[69] This meant that two of the largest types of contributor to the smoke nuisance would be subject to no new regulations, setting the stage for more conflicts over this issue in Montreal (and Toronto) in the decades to follow.

The citizens committee's draft bylaw was formally submitted to city council on 24 September 1929.[70] At the time, Alderman Trépanier claimed to be hopeful that it would become law in only a few months. However, it hit a snag when Montreal's chief city attorney declared in a legal opinion, dated 16 January 1930, the article establishing the smoke abatement commission and advisory boards was illegal because the city charter did not authorize the delegation of power in this way.[71] The clause had to be struck out and the bylaw resubmitted. Thus, the smoke abatement division would still be created, but without oversight from a committee of private citizens. Since the city council's term was already drawing to a close, the draft bylaw would have to wait several months for the fall 1930 municipal elections to take place and a new council (and executive committee) to vote on it.

The process to approve Bylaw no. 1112 ("Bylaw to Abate Smoke and to Repeal Bylaw No. 130") recommenced late in the year. On 26 November 1930, a city hall committee composed of aldermen, a city engineer, and two representatives of the Dominion Coal and Steel Company approved the newly amended bylaw and sent it to the executive committee of city council for approval.[72] In rapid succession, the executive committee and city attorney approved and forwarded drafts, and finally on 3 February 1931 it was passed by city council.[73] The main substantive change to the draft bylaw submitted by the citizens smoke committee was the legally required elimination of the citizen oversight commission. Apart from that, small changes to the objective standard occurred. Given that Montreal had no legal authority to regulate locomotives and steamships (these were under the jurisdiction of the federal government which, as mentioned above, maintained its own emissions standards for these polluters), language about regulating them was removed. And while the standard for metallurgical furnaces remained the same as in the draft regulation, it was made slightly more stringent for other types of applications on the basis that an economical means was available, namely, the use of cleaner forms of coal such as coke.[74]

The Montreal Board of Trade, then, not only introduced the smoke nuisance to the city's decision-making agenda, but also participated closely in the formulation of the policy response. To be sure, the technical work of writing the bylaw needed to be conducted by engineers in close collaboration with the firms subject to the regulations. But Board of Trade Representative Walter Molson served as one of only eleven members on the committee that wrote the statute and led the effort to engage with polluters in advance of the passage of the regulations to ensure a smoother transition to the regulatory regime and lessen pollution more quickly. After Bylaw no. 1112's initial drafting and eventual passage, the Board of Trade continued to exert pressure on the city to maintain clean air.

Monitoring Implementation

The city's Boiler and Smoke Inspection Department commenced work on 1 May 1931, with four smoke inspectors working under its newly appointed supervisor, R. Marchand (the city's former chief boiler inspector and a participant in the citizens smoke committee).[75] Marchand divided the city into four districts, assigned each smoke inspector to one of them, and ordered inspectors to distribute copies of Bylaw no. 1112 to polluters and discuss ways in which they could comply with the regulations. By 31 October 1931, more than 1,000 firms

had been contacted by the smoke inspectors and, according to Marchand, 83 of them had already achieved substantial emissions reductions.[76]

In a 25 November 1931 meeting of the Board of Trade Council, members discussed concerns by other Board of Trade members about the allegedly lax enforcement of the bylaw, and decided to ask city government about actions that had been taken.[77] It sent a letter requesting this information to city hall the following day, which was quickly forwarded to Marchand.[78] On 7 December 1931, a representative from city hall sent the Board of Trade a report, written by Marchand, detailing his department's organization and efforts.[79] In it, Marchand explained that the smoke inspectors had thus far taken a non-confrontational approach with polluting firms because complying with the bylaw was a complex undertaking. While the firms had given a generally positive response to the prospect of buying new equipment to obtain emissions levels complying with the bylaw, they had asked for more time to make decisions about which to purchase. Marchland said that demanding immediate compliance at high cost would risk squandering the goodwill that had been generated thus far, and that his department's approach would be to continue working cooperatively with polluters so that they are able to transition to less polluting processes. One week later, Board of Trade Secretary J. Stanley Cook responded with a letter thanking city hall "with regard specially to the work of [Marchand's] officers in the matter of the abatement of the smoke nuisance."[80]

Conclusion

In Montreal—Canada's largest city and an industrial hub fuelled by maritime bituminous coal—the air was substantially polluted during the 1920s. Although this smoke problem was experienced by all who lived and worked in the city, the political incentive to address it did not derive from a broad-based consensus or democratic process of solution formulation. "Citizens committee" members were actually economic elites and technical experts representing the city's most powerful growth coalition, universities, and heavy industry. Specifically, the Montreal Board of Trade placed the smoke nuisance on the public agenda by contacting city council about the problem and producing a preliminary report defining the issue and requesting that the city government prioritize it. When the existing bylaw was found to be ill-suited for the city's subsequent efforts to control the nuisance, the Board of Trade participated in the citizens committee that wrote the new bylaw and approached businesses in an educational campaign to ease the firms' transition to the new regulations. To be sure, the bylaw represented a compromise among business interests, since language regulating steamships and locomotives was eventually eliminated. But what remained in place regulated buildings (including factories) more stringently, and the fact that a compromise with the nationally regulated shipping industry occurred does not negate the importance of the Board of Trade's actions. Afterwards, once the bylaw was in effect, the Board of Trade monitored the bylaw's implementation by asking city council about its enforcement.

The Board of Trade was concerned about the smoke nuisance because it would render the city an undesirable place to visit and harm its reputation among other cosmopolitan urban areas, thereby undermining local growth and economic prosperity. This specific concern was not only expressed in these terms by Board of Trade members in the minutes of their council meetings, but more generally it was consistent with the Board of Trade's desire for policy that would prevent what President Gifford Laffoley termed the "new embarrassments" that regularly face the business community. Yet the in-house knowledge of the Board of Trade council was itself insufficient to respond to this highly technical problem. Technology had to exist that would bring about reductions, and engineers with knowledge of this technology needed to participate in the writing of regulations. In doing so, these engineers were incorporated into the political process initiated by the Board of Trade as a way to serve its objective of lessening pollution inexpensively while avoiding measures that would limit economic activity (despite the fact that the pollution was a by-product of this economic activity).

These findings are consistent with the mounting literature on urban air pollution political history discussed above. Taken together, they signify that air pollution politics is more than mere interest group politics, or an elite form of pluralism. The persistent fact of local elite-led (and primarily growth coalition-led) air pollution governance with a reliance on technology to address the problems suggests that it is a constitutive feature of capitalism's manifestation in diversified urban areas. Markets enabling wealth production through the use and sale of land require clean air, but not at the cost of the economic activity producing the nuisance to begin with.

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Notes

1 Ted Moore, "Democratizing the Air: The Salt Lake Women's Chamber of Commerce and Air Pollution, 1936–1945," *Environmental History* 12, no. 1 (2007): 80–106; George Gonzalez, *The Politics of Air Pollution: Urban Growth, Ecological Modernization, and Symbolic Inclusion* (Albany, NY: SUNY Press, 2005). For an overview of the study of urban environmental nuisances in Montreal, and Canada more generally, see Owen Temby, "Environmental Nuisances and Political Contestation in Canadian Cities:

Research on the Regulation of Urban Growth's Unwanted Outcomes," *Urban History Review / Revue d'histoire urbaine* 44, nos. 1–2 (2015/16): 5–9.

2 Owen Temby, "Trouble in Smogville: The Politics of Toronto's Air Pollution during the 1950s," *Journal of Urban History* 39, no. 4 (2013): 669–89; Temby and Ryan O'Connor, "Property, Technology, and Environmental Policy: The Politics of Acid Rain in Ontario, 1978–1985," *Journal of Policy History* 27, no. 4 (2015): 636–69. See also Don Munton and Owen Temby, "Smelter Fumes, Local Interests, and Political Contestation in Sudbury, Ontario, during the 1910s," *Urban History Review / Revue d'histoire urbaine* 44, nos. 1–2 (2015/16): 24–36; Ryan O'Connor, "An Ecological Call to Arms: *The Air of Death* and the Origins of Environmental Activism in Ontario," *Ontario History* 105 (Spring 2013): 19–46; and John D. Wirth, *Smelter Smoke in North America: The Politics of Transborder Pollution* (Lawrence, KS: University Press of Kansas, 2000). While Wirth's account of the Trail Smelter dispute focuses on activist farmers rather than elites, his identification of property-owners as the source of the political incentive to address air pollution represents an important commonality with recent research by Moore, Gonzalez, Munton, Temby, and O'Connor.

3 Two representative and influential examples of this literature include Harvey Molotch, "The City as a Growth Machine: Toward a Political Economy of Place," *American Journal of Sociology* 82, no. 2 (1976): 309–32; and Clarence N. Stone, "Urban Regimes and the Capacity to Govern: A Political Economy Approach," *Journal of Urban Affairs* 15, no. 1 (1993): 1–28.

4 For another study that similarly places importance on technology in clean air policy, see David Stradling, *Smokestacks and Progressives: Environmentalists, Engineers, and Air Quality in America, 1881–1951* (Baltimore: Johns Hopkins University Press, 1999).

5 Joel A. Tarr, "The Metabolism of the Industrial City: The Case of Pittsburgh," *Journal of Urban History* 28, no. 2 (2002): 511–45; S. Olson, "Downwind, Downstream, Downtown: The Environmental Legacy in Baltimore and Montreal," *Environmental History* 12, no. 4 (2007): 845–66.

6 Sylvia Gierlinger, Gertrud Haidvogl, Simone Gingrich, and Fridolin Krausmann, "Feeding and Cleaning the City: The Role of the Urban Waterscape in Provision and Disposal in Vienna during the Industrial Transformation," *Water History* 5 (2013): 219–239.

7 The first peat mined in Canada in 1864 was sold as fuel for locomotives. Barry G. Warner and Pierre Buteau, "The Early Peat Industry in Canada. 1864–1945," *Geoscience Canada* 27, no. 2 (June 2000): 57–66; Charles Doyon, "Dugald MacDougall," *Dictionary of Canadian Biography* (hereafter *DCB*).

8 Local elites involved in the Canada Peat Fuel Company included men like MacDougall, Hodges, Shanley, Dow, and Redpath. Doyon, "Dugald MacDougall," *DCB*.

9 Christopher F. Jones, *Routes of Power: Energy and Modern America* (Cambridge, MA: Harvard University Press, 2014).

10 Canada, *Report of the Royal Commission on Coal, 1946* (Ottawa: Edmond Cloutier, 1947), 434.

11 Meredith F. Burrill, "A Brief Résumé of the Abstract of the Montreal Industrial Survey," 1931, fonds Montreal Board of Trade 1822–1952 (hereafter MBOT), roll M-2789, 4 M 000 00-03-702B-01, Montreal Board of Trade—Registres des deliberations: 1927 à 1935, Montreal Board of Trade—Assemblèes gènèrales, Bibliothèque et Archives nationales du Québec, Québec (hereafter BAnQ-Québec).

12 Ibid.

13 Herbert Ames, *The City below the Hill: A Sociological Study of a Portion of the City of Montreal, Canada* (Montreal: 1897).

14 Ernest Pitt was the owner of Ernest Pitt & Company, a real estate and insurance firm. He served as president of the Board of Trade's Montreal Real Estate Board in 1927 and ex-officio in 1928. Montreal Board of Trade, *Report 1927*, fonds MBOT, roll M-2807, 4 M 000 00-03-720B-01, Montreal Board of Trade—Rapports annuels du Conseil: 1923; 1924 à 1927; 1928 à 1931, BAnQ-Québec.

15 Ernest Pitt, "Smoke Is Still Evil in Montreal: Broker Points Out Influence on Real Estate Values," *Canadian Jewish Chronicle*, 27 December 1929.

16 Robert Lewis, *Manufacturing Montreal: The Making of an Industrial Landscape*, 1850–1930 (Baltimore: Johns Hopkins University Press, 2000).

17 Canada's largest period of rail expansion was in the first quarter of the twentieth century. Alan Green, "Growth and Productivity Change in the Canadian Railway Sector, 1871–1926," in *Long-Term Factors in American Economic Growth*, ed. S.L. Engerman and R.E. Gallman (Chicago: University of Chicago Press, 1986), 790.

18 Lewis, *Manufacturing Montreal*, 19, 22.

19 Canada, Dominion Bureau of Statistics, *Coal Statistics for Canada, For the Calendar Year 1930* (Ottawa: F.A. Acland, 1931), 18, 54–5, and table 11 "Shipments of Coal from Canadian Mines by Grades and Destinations, 1929 and 1930," 12.

20 EPA, *AP-42, Compilation of Air Pollutant Emission Factors* (Research Triangle Park, NC: EPA, 1993), table 4-4, "Summary of Emission Factors for Particulate Matter (PM), and Lead from Anthracite Combustors," and table 1.1-4, "Uncontrolled Emission Factors for PM and PM-10 from Bituminous And Subbituminous Coal Combustion."

21 Most cordwood brought to cities would have been dry hardwood, so at a rate of 2,500 lbs (1,134 kg) per cord this annual consumption would have equalled 465,713,069 kg. Joshua MacFadyen, "Hewers of Wood: A History of Wood Energy in Canada," in *Powering Up Canada: The History of Power, Fuel, and Energy from 1600*, ed. R.W. Sandwell, 129–61 (Montreal and Kingston: McGill-Queen's University Press, 2016).

22 James E. Houck and Paul E. Tiegs, "Residential Wood Combustion: $PM_{2.5}$ Emissions" (unpublished report prepared for WESTAR $PM_{2.5}$ Emission Inventory Workshop, Reno, Nevada, 22–3 July 1998).

23 Canada, *Report of the Royal Commission on Coal*, 434.

24 E.A. Collard, *The Montreal Board of Trade. 1822–1972: A Story* (Montreal: Montreal Board of Trade,1972), microfiche SEM105P3218, Grande Bibliothèque, Montreal.

25 Paul-André Linteau, René Durocher, and Jean-Claude Robert, *Quebec: A History, 1867–1929*, trans. Robert Chodos (Toronto: Lorimer, 1983), 405.

26 Editorial, "The Board of Trade," *Montreal Gazette*, 29 January 1930. Similarly, the *Montreal Daily Star's* editorial board commented, "There are few more influential bodies in Montreal than the Board of Trade. Its responsibilities are onerous, and its position as the leading organization of its kind in the Dominion lays upon it an exceptionally heavy burden. Fortunately, the Board has had men at its head who have recognized this responsibility and who have been at pains to discharge it to the best of their ability, availing themselves of the best expert advice they could obtain upon all problems of public importance." Editorial, "Montreal Board of Trade," *Montreal Daily Star*, 29 January 1930.

27 The Board of Trade reported 970 voting members at the January 1928 election. Montreal Board of Trade, Minutes of Annual General Meeting, 31 January 1928, fonds MBOT, roll M-2794, 4 M 000 00-03-702B-01, BAnQ-Québec.

28 Montreal Board of Trade, Minutes of Special Meeting of Council, 7 June 1927, fonds MBOT, roll M-2789, 4 M 000 00-03-702B-01, Montreal Board of Trade—Registres des deliberations: 1927 à 1935, BAnQ-Québec.

29 Montreal Board of Trade, Minutes of Annual General Meeting, 31 January 1928.

30 Montreal Board of Trade, *Report 1927.* Capitalization in original.

31 Montreal Board of Trade, Minutes of Annual General Meeting, 31 January 1928. Capitalization and punctuation in original.

32 In addition to maintaining detailed minute books, the Board of Trade released annual reports containing financial and membership information and issue-by-issue summaries of the measures taken during the previous year to formulate policy and govern the city. Fonds MBOT, roll M-2807, 4 M 000 00-03-720B-01, Montreal Board of Trade—Rapports annuels du Conseil: 1923; 1924 à 1927; 1928 à 1931, BAnQ-Québec.

33 Montreal Board of Trade, Minutes of Annual General Meeting, 31 January 1928. Capitalization and punctuation in original.

34 Gonzalez, *Politics of Air Pollution; Moore*, "Democratizing the Air."

35 Montreal Council of Women, annual reports 1920–1930, box 1997-05-003/2, folders 4-9, 4-10, and 4-11, fonds Montreal Council of Women, BAnQ-Vieux-Montreal; Montreal Council of Women, minutes of meetings 1922–1931, box 1997-10-001/4, folders 1-7, 1-8, 1-9, and 1-10, fonds Montreal Council of Women, BAnQ-Vieux-Montreal.

36 S.R.W. Allen to Jules Crépeau, 12 July 1930; Jules Crépeau to S.R.W. Allen, 15 July 1930; S.R.W. Allen to Bessie A. Ross, 24 July 1930, box 1997-10-001/9, folder 6-11, fonds Montreal Council of Women, BAnQ-Vieux-Montreal. The fact that these letters were the only correspondence the MLCW had with the city government about the smoke issue is confirmed by a document in folder 6-11 of this box, listing all such correspondences from 1899 to 1962.

37 Harold Kaplan, *Reform, Planning, and City Politics: Montreal, Winnipeg, Toronto* (Toronto: University of Toronto Press, 1981), 328–35; Paul-André Linteau, *The History of Montréal: The Story of a Great American City*, trans. Peter McCambridge (Montreal: Baraka Books, 2013), chap. 9. As Kaplan and Linteau explain, in the period prior to the events covered by our study, especially the mid-1910s to early 1920s, Montreal underwent considerable political upheaval and heightened Anglo-Franco tensions. As a result of these tensions and at the request of anglophone business elites, from 1918 to 1921, the city government was in trusteeship and managed by an administrative commission consisting of five representatives appointed by the Quebec government. The administrative commission undertook considerable reforms before it was replaced in 1921 with city council's executive committee. While it is plausible that the city government's fraught history with anglophone business leaders influenced its responsiveness to the Board of Trade on the smoke nuisance issue (or lack of initial response, in 1926), any assertion about how, given the absence of available evidence, would constitute post-hoc conjecture.

38 Montreal Board of Trade, Minutes of Sixth Ordinary Meeting of Council, 17 March 1926, fonds MBOT, roll M-2788, 4 M 000 00-03-701B-01, Montreal Board of Trade—Registres des deliberations: 1919 à 1927, BAnQ-Québec.

39 Montreal Board of Trade, Minutes of First Ordinary Meeting of Council, 2 February 1927; Minutes of the Second Ordinary Meeting of Council, 9 February 1927, fonds MBOT, roll M-2789, 4 M 000 00-03-702B- 01, Montreal Board of Trade—Registres des deliberations: 1927 à 1935, BAnQ-Québec.

40 Montreal Board of Trade to Mayor Médéric Martin, 12 February 1927, VM-1-fonds du CM/CE 3ie série, roll 264, 083-01-09-02, Mesures adoptées pour faciliter à Montréal, la suppression de la fumée, 1927–1931, Archives Municipales de Montréal (hereafter AMDM).

41 Mayor Médéric Martin to Montreal Board of Trade, 14 February 1927, VM-1-fonds du CM/CE 3ie série, roll 264, 083-01-09-02, Mesures adoptées pour faciliter à Montréal, la suppression de la fumée, 1927–1931, AMDM.

42 Author's translation: "to instruct the director of public works to take the necessary procedures against persons or companies who violate the smoke regulations, to see that these cases are processed quickly and are not reproduced, and to report to the committee on these cases weekly as well as the results achieved." Municipal Council of Montreal, extract of the minutes of the monthly meeting, 18 February 1927, VM-1- fonds du CM/CE 3ie série, roll 264, 083-01-09-02, Mesures adoptées pour faciliter à Montréal, la suppression de la fumée, 1927–1931, AMDM.

43 Montreal Board of Trade, Minutes of the Second Ordinary Meeting of Council, 9 February 1927, fonds MBOT, roll M-2789, 4 M 000 00-03-702B-01, Montreal Board of Trade—Registres des deliberations: 1927 à 1935, BAnQ-Québec; "Aims to Abolish Smoke Nuisance: Board of Trade Seeks Information on Subject—Endorses Summer Time," *Montreal Gazette*, 24 March 1927.

44 Montreal Board of Trade, Minutes of the Seventh Ordinary Meeting of Council, 23 March 1927; Minutes of the Ninth Ordinary Meeting of Council, 6 April 1927, fonds MBOT, roll M-2789, 4 M 000 00-03-702B- 01, Montreal Board of Trade—Registres des deliberations: 1927 à 1935, BAnQ-Québec.

45 Montreal Board of Trade, *Report 1927*.

46 The Board of Trade's annual reports list all members' committee memberships, professional affiliations, and addresses.

47 Allen Winn Sneath, *Brewed in Canada: The Untold Story of Canada's 350-Year-Old Brewing Industry* (Toronto: Dundurn, 2001), chap. 5.

48 *Report of the Royal Commission on Anthracite Coal* (Ottawa: King's Printer, 1937), http://publications.gc.ca/collections/collection_2014/bcp-pco/CP32-140-1937-eng.pdf.

49 Montreal Board of Trade, Minutes of Sixteenth Ordinary Meeting of Council, 12 October 1927; Minutes of Seventeenth Ordinary Meeting of Council, 26 October 1927, fonds MBOT, roll M-2789, 4 M 000 00-03-702B-01, Montreal Board of Trade—Registres des deliberations: 1927 à 1935, BAnQ-Québec.

50 The report is available in the Board of Trade's minute book and in its 1928 Annual Report. Montreal Board of Trade, Minutes of Seventeenth Ordinary Meeting of Council, 26 October 1927, fonds MBOT, roll M-2789, 4 M 000 00-03-702B-01, Montreal Board of Trade—Registres des deliberations: 1927 à 1935, BAnQ-Québec; and *Report 1928*, fonds MBOT, roll M-2807, 4 M 000 00-03-720B-01, Montreal Board of Trade—Rapports annuels du Conseil: 1923; 1924 à 1927; 1928 à 1931, BAnQ-Québec.

51 "Committee Report on Smoke Nuisance, *Montreal Gazette*, 27 October 1927.

52 Author's translation: "To instruct the director of public works to report to the committee, as soon as possible, courses of action that will stop the smoke nuisance." Municipal Council of Montreal, extract of Executive Council meeting minutes, 28 December 1927, VM-1-fonds du CM/CE 3ie série, roll 264, 083-01-09-02, Mesures adoptées pour faciliter à Montréal, la suppression de la fumée, 1927–1931, AMDM. For a record of City Hall's formal acknowledgement of receiving the report, see Montreal Board of Trade, Minutes of Nineteenth Ordinary Meeting of Council, 9 November 1927, fonds MBOT, roll M-2789, 4 M 000 00-03-702B-01, Montreal Board of Trade—Registres des deliberations: 1927 à 1935, BAnQ-Québec.

53 "Smoke Nuisance in City Is Discussed," *Montreal Daily Star*, 15 February 1929.

54 Ibid.

55 Municipal Council of Montreal, extract of Executive Council meeting minutes, 17 April 1928; city clerk to Protestant Board of School Commissioners, 20 April 1928; Protestant Board of School Commissioners to city clerk, 8 May 1928, VM-1-fonds du CM/CE 3ie série, roll 264, 083-01-09-02, Mesures adoptées pour faciliter à Montréal, la suppression de la fumée, 1927-1931, AMDM.

56 "Smoke Nuisance Is Matter for Action, Citizens Declare," *Montreal Gazette*, 15 February 1929.

57 The list of attendees was reported in 15 February 1929 articles in both the *Montreal Daily Star* and the *Montreal Gazette*. They report fifty-one

attendees, including members of the city government. The Board of Trade's 20 February 1929 meeting minutes report the attendance of "some forty citizens." The represented organizations were: the Canadian Pacific Railway, the Canadian National Railway, Montreal Tramways Company, Harbor Commissioners, National Breweries, Molson's Brewery, McGill University, University of Montreal, Engineering Institute of Canada, Builders' Exchange, Montreal Coal Association, Province of Quebec Safety League, Montreal Board of Trade, Chambre de Commerce du District de Montreal, City Improvement League, Proprietors' League, Architects' Association of Quebec, Association of Retail Merchants or Canada, Canadian Manufacturers' Association, Canadian Press, Province of Quebec Hotel Association, Federation of Jewish Philanthropies, Metropolitan Planning Board, Bell Telephone, British Empire Steel Corporation, Dominion Coal Company, Wilsils Limited, Provincial Department of Public Works, Association des Hommes d'Affaires de l'Est, Catholic Schools Commission, and Protestant Board of Schools Commissioners. The twelve attendees we find in the Board of Trade records as members include both attendees formally representing the Chambre de Commerce du District de Montreal. Apart from these interlocking memberships, the francophone chamber of commerce appears uninvolved in the smoke issue.

58 "Smoke Nuisance Is Matter for Action"; "Smoke Nuisance in City Is Discussed."

59 "Smoke Nuisance Is Matter for Action."

60 The eleven organizations with representation on the smoke advisory subcommittee were: Montreal Board of Trade, Chambre de Commerce, the Harbor Commission, the Engineering Institute, the Canadian Manufacturers' Association, the Coal Merchants' Association, British Empire (Dominion) Steel Corporation, McGill University, University of Montreal, Canadian Pacific Railway, and Canadian National Railway. Board of Trade member A.W. McMaster was later appointed Dominion Steel's representative. "Smoke Nuisance Is Matter for Action."

61 Ibid.

62 Montreal Board of Trade, Minutes of the Second Ordinary Meeting of Council, 20 February 1929, fonds MBOT, roll M-2789, 4 M 000 00-03-702B-01, Montreal Board of Trade—Registres des deliberations: 1927 à 1935, BAnQ-Québec.

63 Quoted in "Smoke Nuisance Is Nearing Control," *Montreal Gazette*, 5 June 1929.

64 Ibid.

65 "Smoke Nuisance May Be Modified," *Montreal Gazette*, 1 May 1929.

66 "Smoke Nuisance Is Nearing Control."

67 "Smoke Nuisance May Be Modified."

68 "Smoke Nuisance Is Nearing Control." For an overview of the Ringelmann Smoke Chart, see U.S. Bureau of Mines, Office of the Director of Coal Research, "Ringelmann Smoke Chart," I.C. 8333 (Washington, DC: U.S. Government Printing Office, 1967), http://www.cdc.gov/niosh/mining/works/coversheet114.html.

69 Smoke Nuisance Is Nearing Control."

70 Municipal Council of Montreal, extract of Executive Council meeting minutes, 24 September 1929, VM-1-fonds du CM/CE 3ie série, roll 264, 083-01-09-02, Mesures adoptées pour faciliter à Montréal, la suppression de la fumée, 1927–1931, AMDM.

71 "New Council Will Hear Smoke By-Law," *Montreal Gazette*, 28 February 1930.

72 "Smoke Abatement Move Progresses," *Montreal Gazette*, 27 November 1930; H.A. Terreault to Honoré Parent, 28 November 1930, VM-1-fonds du CM/CE 3ie série, roll 264, 083-01-09-02, Mesures adoptées pour faciliter à Montréal, la suppression de la fumée, 1927–1931, AMDM.

73 Municipal Council of Montreal, extract of Executive Council meeting minutes, 2 December 1930; Honoré Parent to Guillaume Saint-Pierre, 23 December 1930; Saint-Pierre to Parent, 23 December 1930, Executive Committee to Montreal City Council, 30 December 1930, VM-1-fonds du CM/CE 3ie série, roll 264, 083-01-09-02, Mesures adoptées pour faciliter à Montréal, la suppression de la fumée, 1927–1931, AMDM.

74 Specifically, Article 9 of Bylaw no. 1112 states, "Coke shall be used for … [a]ny stationary or movable machinery or apparatus of any capacity whatever emitting smoke, operated with City limits, such as engines, rock-crushers, shovels, excavators, derricks, rollers, concrete mixers, tar kettles and other apparatus of the same category." City of Montreal, Bylaw no. 1112, Bylaw to abate smoke and to repeal Bylaw no. 130, s 9.

75 R. Marchand to J. Elie Blanchard, 23 November 1931, VM-1-fonds du CM/CE 3ie série, roll 264, 083-01-09-02, Mesures adoptées pour faciliter à Montréal, la suppression de la fumée, 1927–1931, AMDM.

76 Ibid.

77 "Board of Trade's Proposal on City's Bill Is Adopted," *Montreal Gazette*, 26 November 1931; Montreal Board of Trade, Minutes of the Twentieth Ordinary Meeting of Council, 25 November 1931, fonds MBOT, roll M-2789, 4 M 000 00-03-702B- 01, Montreal Board of Trade—Registres des deliberations: 1927 à 1935, BAnQ-Québec.

78 Montreal Board of Trade to Honoré Parent, 25 November 1931; Parent to Montreal Board of Trade, 30 November 1931; R. Marchand to J. Elie Blanchard, 4 December 1931, VM-1-fonds du CM/CE 3ie série, roll 264, 083-01-09-02, Mesures adoptées pour faciliter à Montréal, la suppression de la fumée, 1927–1931, AMDM.

79 Honoré Parent to Montreal Board of Trade, 7 December 1931, VM-1-fonds du CM/CE 3ie série, roll 264, 083-01-09-02. Mesures adoptées pour faciliter à Montréal, la suppression de la fumée, 1927–1931, AMDM.

80 Montreal Board of Trade to Honoré Parent, 14 December 1931, VM-1-fonds du CM/CE 3ie série, roll 264, 083-01-09-02, Mesures adoptées pour faciliter à Montréal, la suppression de la fumée, 1927–1931, AMDM.