Fuel as a Factor in Canadian Transport: Energy Capital and Communication Theory

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ABSTRACT

Background *Established in 1849, the Fort Rupert coal settlement represented a departure in the Hudson's Bay Company's mode of colonial wealth accumulation on Vancouver Island. Company officials failed, however, to appreciate basic differences in the new mode of accumulation, including the importance of transportation to capitalist mineral extraction.*

Analysis *This article accomplishes three things: it retrieves foundational theories of transportation and commodity circulation once popular in communication studies, provides a documentary account of coal mining and the coal trade in the mid-nineteenth-century eastern Pacific, and articulates a theory of capitalist energy consumption.*

Conclusion and implications *The culminating theory of energy capital positions the extraction and circulation of fuel within Canadian communication studies through a transportation-focused approach to communication.*

Keywords *Canadian history; Communication theory; Energy; Marxism; Transportation*

RÉSUMÉ

Contexte *L'agglomération de Fort Rupert établie en 1849 pour extraire le charbon sur l'Île de Vancouver représenta pour la Compagnie de la Baie d'Hudson une nouvelle sorte de colonisation axée sur l'enrichissement. Les dirigeants de la Compagnie, cependant, n'ont pas reconnu des particularités fondamentales relatives à ce nouveau mode d'accumulation, y compris l'importance de moyens de transport jusqu'au site d'extraction des minerais.*

Analyse *Cet article vise trois objectifs : il récupère des théories fondatrices, populaires jadis dans le domaine des communications, sur le transport et la circulation des marchandises; il fournit un compte rendu sur l'extraction et le commerce du charbon dans l'Est du Pacifique au milieu du 19ème siècle; et il articule une théorie capitaliste sur la consommation énergétique.*

Conclusion and implications *La théorie principale sur le capital en énergie positionne l'extraction et la circulation de combustibles au sein des études en communication au Canada en ayant recours à une approche centrée sur le transport.*

Mots clés *Canadian history; Communication theory; Energy; Marxism; Transportation*

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This article is about the circulation of commodities, people, and property relations as capitalism expanded during the nineteenth century. It is also about the connections between circulation, the process of extracting fossilized plants from beneath a large island off the west coast of North America, and fuel as a factor in the political economy of communication and that of the Pacific coast in the mid-nineteenth century. The case study is somewhat unusual for communication studies, which has embraced questions of transportation but until recently failed to address problems of energy.

Viewed in the context of the field, especially in Canada, the energy lacuna is somewhat surprising. The ontology of "communication" is notably broad in communication studies; the classificatory regime that designates what is or is not a problem of communication leans heavily toward inclusion. In part, this is the consequence of numerous intellectual traditions operating in communication. Robert T. Craig and Heidi L. Muller (2007), for example, identify seven dominant traditions that comprise communication theory—the rhetorical, the phenomenological, the semiotic, the cybernetic, the socio-psychological, the sociocultural, and the critical—each with its foundational statements, subprograms, rules, theoretical intricacies, internal debates, and loose study programs. In practice, these theoretical traditions most often address oral/aural media when developed within communication departments. This tendency does not, however, exhaust potential research programs.[1]

Disciplinary practices in communication may be somewhat narrower than theoretical traditions, if only slightly. Soon after the growth of Canadian communication departments in the 1970s, Liora Salter observed that the parent disciplines of communication in Québec and Canada were literature, history, sociology, and political science (1981), although we would do well to consider this list non-exhaustive. Salter's comment suggests two shifting axes from which to consider research: theory and discipline, and theoretical commitments cut across disciplinary fields in interesting ways. Perhaps more so in communication studies than other fields within the social sciences and humanities, internal differences in theory and discipline generate a multitude of research problems. "Today the sweep and import of communication have become virtually uncontained," Dan Schiller wrote two decades ago. Narrowing his scope only slightly, Schiller continued: to study communication is to "make arguments about the forms and determinants of sociocultural developments as such" (1996, p. vii).

Foregrounding the relationship between power and communication, Salter argued that, at its origins in Canada, communication studies "demanded an analysis of the relations between the technological form (media of communication) and political system (empires), between social experiences and economic context" (1981, p. xvii).[2] Advances in media and communication systems, implicated in the development of political and economic regimes, are, in other words, the object of study in communication. In Canada, the demand that communication consider this relationship is in no small part related to the political-economic history of regional and international capital in the country. Transportation and the circulation of commodities occupy exaggerated importance in regions dependent on external empires, as does the problem of powering circulation. The energy lacuna is perhaps doubly intriguing, then, given the attention recent political regimes in Canada have paid to fuel.

The study of energy and political power in Canada has, however, begun to emerge in communication. Gunster (2011), Gunster and Saurette (2014), Levenda, Mahmoudi, and Sussman (2015), and Raso and Neubauer (2016) are all notable exceptions to the deficiency of energy research in communication, published in this journal. Each provide a political economy of energy politics in Canada. Framing and representation, rather than transportation, form the dominant focus of this group, although Levenda et al. (2015) is something of a departure, putting forward a critique of digital technology and value in the energy sector. The current case study, which draws from documentary and secondary research into the Fort Rupert coal settlement, is, therefore, not only a contribution of original research to the field of communication, but also positions the circulation of energy within the scope of communication and a growing body of energy research. As recent work from the Canadian political economist of communication Vincent Mosco (2014) reminds us: energy (electricity, in Mosco's study) is a necessary condition of communication. Networks of communication require energy to emerge and be sustained. Coal was, in this way, a necessary component in a world system for communication, commodity circulation, and colonization in the nineteenth century, especially its second half.

What follows makes a case to include problems of energy production and circulation in communication studies, especially Canadian communication studies. The article first introduces approaches to communication from Harold Innis and Karl Marx that highlight the role of transportation in political economy. Innis, regarded as a "foundational" theorist of communication in Canada (Babe, 2000), understood the problem of communication as one of the administration of population, economy, and empire, although the cultural results of media and communication technologies implicated the entirety of the social realm. Transportation appeared to Innis as a crucial factor in Canadian political economy, in which, for example, trade routes through Precambrian Canada inscribed developmental patterns. Discussions of social class are, however, mostly absent (Drache, 1982),[3] with much of the heavy lifting in this regard accomplished by researchers working in Innis' tradition.

Marx's work, by contrast, demonstrated that social relationships defined by class established the production and circulation of commodities. He argued transportation and communication infrastructure are developments of class-based societies. So important are these systems to human improvement that, in the communist project, their socialization is regarded as a fundamental condition of the proletarian state (Marx & Engels, 2011). Although the influence of Innis and Marx on communication studies is not limited to commodity circulation and exchange, both prefigure extensions within the field beyond oral/aural media systems and communication practices.

Drawing from the discussion of Innis and Marx, this article presents a case study of fuel extraction and circulation at the origin of industrial capitalism in British Columbia (BC) at the Fort Rupert settlement, in which energy and transportation are inextricably linked to both the Canadian colonial project and an emerging world market, facilitated by the expansion of steam-powered maritime networks of circulation. The Fort Rupert study and the transportation-focused approach to communication retrieved in later sections demonstrate that the production and transportation of com-

modities pose the related problem of acquiring energy to power, locating fuel within the orbit of communication studies. Like Andreas Malm (2016), I am interested in the juncture of fossil-fuel power and the dominant power relations in capitalist society, particularly the relationship between energy and the emergence and development of capitalist social relations in (what would become) Canada.

The transportation-focused approach to communication

In *Empire and Communications*, Harold Innis (2007) remarked that significant political regimes, if they are to be durable, seek stability between what he calls time-biased and space-biased media—communication technology of permanence and that which is easily transmitted across space. The problem of media and communication, for Innis, could be expressed as one of administration, with the material form of media suggestive of future development. The materiality of media may restrict or structure administration. The complex writing systems of the Egyptian empire, to take one of Innis' examples, supported a monopoly of knowledge held by the ruling classes, as well as rather inflexible, hierarchic administration across the empire.

Famously, the problem of administration across space and time concerned Innis throughout his career. Before its formulation as a problem of written media, Innis dealt with administration through the circulation of bodies, commodities, and ideas. Reflecting his training as an economic historian, Innis saw infrastructures of trade as being expressed in government. The problem of moving commodities nationally and internationally, foremost in Canadian development, was one of empire and the state.

> We can trace in direct descent from the introduction of steam on the St. Lawrence waterways, the Act of Union, the completion of the St. Lawrence canals, the Grand Trunk, Galt's statement, Confederation, the Intercolonial, the National Policy, the Canadian Pacific Railway, improved St. Lawrence canals, the new transcontinentals, and the drift toward protection. (Innis, 1995, p. 137)

The centrality of commodity circulation to Canadian economic administration appeared such a truism for the writer that Innis began "Transportation as a Factor in Canadian Economic History" by remarking that "[t]ransportation has been of such basic importance to Canadian economic history that the title of this paper may appear redundant and inclusive" (p. 123).

The articulation of state power in development always exceeds the purely economic, however. For Innis, the Canadian Pacific Railway was a technology that unified Canada, an expression of "colonial civilization's expansion beyond the areas dictated by the rivers and drainage basins shaping the fur trade and its settlements" (Weafer, 2012, p. 5). Aware of the role of transportation in Canadian economic development, the nineteenth-century political class came to regard the communication of commodities and bodies as a problem of governance. Economic policy concerned with the search for new markets was tethered to the administrative demands of a soon-to-be confederated space (Innis, 1995). It is, in this way, no surprise that Innis' attention to space, indeed to *space-binding* media technology, permeated the Canadian communi-

cation tradition. As Miles Weafer (2012) shows, "Innis's special contribution to communication studies is his maintenance of a transportation-focused approach to media and communication" (p. 6), to which we can add political economy.

For Marx, unlike Innis, transportation and communication networks support social transformations in class-based societies. In Ben Fowkes' English translation of *Capital*, volume 1 (Marx, 1990a), communication is regularly treated with transportation as a factor in the transmission of commodities, denoted as the means of transportation and communication. Similarly, the posthumously released "Results of the Immediate Process of Production," written for volume 1, considered production and transportation networks as co-developmental, or at the very least, the latter was conditionally inhered in the development of the former.

> For capitalist relations to establish themselves at all presupposes that a certain historical level of social production has been attained. Even within the framework of an earlier mode of production certain needs and certain means of communication and production must have developed which go beyond the old relations of production and coerce them into the capitalist mould. (Marx, 1990b, p. 1064).

Less a problem of administration than in Innis, transportation as communication is a means for commodity distribution, a lynchpin of capitalist development. "[T]he production and the circulation of commodities are the general prerequisites of the capitalist mode of production" (1990a, p. 473) Marx wrote in his magnum opus.

The development of transportation as a condition of economic development also appeared in the most popular translation of *The German Ideology*.

> The next extension of the division of labour was the separation of production and intercourse, the formation of a special class of merchants; a separation which, in the towns bequeathed by a former period, had been handed down … With this there was given the possibility of commercial communications transcending the immediate neighbourhood, a possibility the realisation of which depended on the existing means of communication … . (Marx & Engels, 1998, p. 75)

The *Marx/Engels Collected Works* (*MECW*) translation of *The German Ideology*, commonly regarded as the most accurate, likewise retained this meaning (Marx & Engels, 2010, p. 67), in which "trade" or "intercourse" are understood as commercial communication.

If we oppose Marx and Innis, the communication theory of one appears as the inversion of the other. Although Innis avoided a kind of determinism of the commodity, physical material was nevertheless crucial to his theory of development. Innis (1970) regarded commodities or granular materialities with something approaching primacy.[4] "Agriculture, industry, transportation, trade, finance, and government activities tend to become subordinate to the production of a staple for a more highly specialized manufacturing community" (p. 385). In communist epistemology, circulation is instead a conditional moment of class society. The connection between the development of circulation and that of production tightens as capitalism develops, because expansions in the latter require the same in the former.

The basis of circulation in social class appeared in pre-capitalist social organization too, as in *The German Ideology*. The separation of production from circulation was a pivotal moment in the development of mercantile trade, or at least arbitrage between markets. Towns could trade with one another through investment within the merchant class, and communication for the purposes of trade thereafter became a problem of class and a condition for class distinction. Following Weafer, we may then classify one Marxist theory of communication—*an approach that identifies the historical importance of communication and transportation systems to classed societies*—and work forward from this definition.

Like the biases of media discovered by Innis, the class power expressed in commodity circulation reminds us that mediation in communication is never merely neutral;[5] no conduit exists without expressing or privileging certain meanings, groups, or polities at the expense of others. The growth of a mercantile bourgeoisie, trading the goods of direct producers, invested the former with social and economic power. The preparation of roads for commodity circulation required that political administrations address problems of transportation infrastructure as subordinate issues of class. The conditions for commodity distribution as a problem of states are, in short, subject to historical hegemonies of thought and administration.

In *The Invention of Communication*, Mattellart (1996) demonstrated the problem of communication routes—roads, canals, the seas and rivers—to eighteenth-century political thought in France. The economic thought of the physiocrats, he explained, permeated French institutions. A movement based in the work of François Quesnay, the physiocrats believed that all wealth accrued from the land. As Marx (1990a) observed, "[T]he Physiocrats insist that only agricultural labour is productive, since that alone, they say, yields a surplus-value. For the Physiocrats, indeed, surplus value exists exclusively in the form of ground rent" (p. 644). The circulation of agricultural accumulation was then critical to the wealth of the nation in general. Physiocrats argued that laissez-faire flows of agricultural products would support the national economy. The physiocrat Anne Robert Jacques Turgot, intendant of Limoges, minister and economic reformer in the *ancien régime,* expanded the French road system to promote the circulation of food. Agricultural producers would in large part fund the expansion and improvement of roads through levied taxes. The means of transportation would, in turn, bring rural France into communication with the cities, especially Paris (Mattelart, 1996). Turgot's network of roads, constituted philosophically by physiocratic pragmatics, administratively by class-specific taxation, shows that the growth and mediation of commodity circulation is intersected by economic, philosophic, and historical phenomena and contingencies, a pattern we will see repeated at Fort Rupert.

The communication of transportation

Although the inverse of one another, the communication theories of both Innis and Marx identify conditional phenomena that promote political-economic change, those of empire or nation and capital or class, respectively. The etymology of the word "communication" would seem to sanction this use. The root *common,* or *commūnicāre*, meaning "to share," has spatial as well as administrative qualities in the early modern period. Not only is communion made holy, sanctioned by the Church, it refers to the

existence of "a common channel of passage." Similarly, a roadway may be a "line of communication between places," related to tracks and waterways (*The Concise Oxford Dictionary of English Etymology*, 1996). The "common" element to communication, related to the holding of things *in common,* evanesces with the real subsumption of daily life under the regime of private property, and few if any remnants of the pre-capitalist interpretation are commonly held in English today.

The German word *Verkehr,* whose English synonyms include transport, communication, traffic, and association, may transmit the notion of communication into Marx, though Marx used it to mean that "relations of work, exchange, property, [and] consciousness" (Mattelart, 1996, p. 101) are intrinsically communicative. Marx would, however, also draw a distinction between transportation and communication systems, splitting the conflation found in *Verkehr.*[6] His use of *Transportwesens* and *Kommunikationswesens* (literally, "systems of transportation" and "systems of communication") calls attention to the particularity of each system. Considering branches of industry that do not produce a physical good, Marx writes in volume 2 of *Capital* that "[t]he only one of these that is economically important is the communication industry, both the transport industry proper, for moving commodities and people, and the transmission of mere information—letters, telegrams, etc." (Marx, 1992**,** p. 134).

The distinction would subsume its own history as Marx's thought developed in the nineteenth century, even after his death. There is no inclusion of *Kommunikationswesens* in the original 1848 German edition of *The Communist Manifesto*, only *Transportwesens.* By the 1888 Samuel Moore English translation, however, "means of communication and transport" is rendered merely from the original *Transportwesens* (Marx & Engels, 1977**,** p. 481). Thus, the sixth post-revolutionary measure for communists to undertake, "centralization of the means of communication and transport in the hands of the State" (Marx & Engels, 2011**,** p. 88), is translated from the original "Zentralisation des alles Transportwesens in den Händen des Staats" (Marx & Engels, 1977, p. 481). Engels' 1847 work *The Principles of Communism*, written for the same Communist League that commissioned the *Manifesto*, listed the almost identical demand: "Concentration of all means of transportation in the hands of the nation" (Engels, 1999, sec. 18), with nationalization of strictly communicative systems absent. Though Marx passed in 1883, Engels lived until 1895 and consulted on the 1888 English translation. Record of this is available in the "Preface to the English Edition of 1888," in which Engels (2011) remarked that he and Moore "revised [the original German version of *The Communist Manifesto*] in common" (p. 40).

The use of "communication" in the Engels-consulted Moore translation of the *Manifesto* reflected the growth of transportation and oral/aural communication systems in the second half of the twentieth century, true of North America and Europe alike. To give an example relevant to coal mining on Vancouver Island: the historian Lynne Bowen (1987) has shown that news of the Crimean War, declared in March of 1854, did not arrive in Fort Victoria until July of that year, despite Britain's involvement in both the war and the colonial project on Vancouver Island. Yet by the time of BC's entrance into Confederation in 1871, "it was possible to get a message from Montréal to New Westminster in four hours via American electric telegraph …" (p. 134).

Although the earliest uses of electric telegraphy predated the *Manifesto*, oral/aural communication systems expanded greatly during the four-decade period between the 1848 German original and the 1888 Moore translation. Communication became unburdened of the cumbersome human bodies that accompanied physical documents during the earlier decades of Marx and Engels' lifetimes, although the expansion of communication proper remained in some sense tied to that of transportation, as telegraphy developed in relation to and often alongside or underneath steam-driven locomotion.[7]

Despite the uneven treatment of communication across their careers, the developmental relationship of transportation and communication systems to the means of production remained a constant from at least 1847's *Principles of Communism*. Systems of communication or transportation are reflected dialectically in productive activity. A similar relationship characterizes the origins of capitalist mineral extraction in the Colony of Vancouver Island after 1849. The etymological containment of transportation by communication (*Verkehr*) finds additional historical footing in the extraction of the Island's coal for potential consumption in communication systems, aiding capitalist expansion in the Pacific following widespread acceptance of the steam engine in production and circulation as the nineteenth century progressed.

Fuel from the fort and property in the Pacific

European coal miners, and with them European methods for mining coal, came to Vancouver Island in an era of economic diversification for the Hudson's Bay Company (HBC), a directive of Governor-in-Chief George Simpson. The existence of coal on and underneath the Island had been brought to the attention of HBC officials as early as the 1830s, but attempts to produce it under the Company's direction would take well over a decade. European spatial organization had been intruding upon the Island since the late eighteenth century, but coal mining represented the first attempt at properly capitalist accumulation, and the subsumption of the Vancouver Island coalfield required a more complete overwriting of Indigenous space by European property relations than had previously occurred.

In the spring of 1849, workers and property were transferred from Fort Stikine, in the Alaskan panhandle, to the area that would become Fort Rupert, near present-day Port Hardy. Certain basic infrastructures were required before miners could be expected to produce coal, and establishing some of these conditions during the spring and summer was the work of those from Stikine. HBC officials were so eager to mine coal that the Company chartered the brigantine *Constantine* from the Russian-American Company for the transfer, at a cost of $1,000 per month, when its *Mary Dare* was late to return from the Hawaiian Islands.

The transportation of material, labour, and knowledge to Fort Rupert followed a handful of overlapping philosophical assumptions and legal conditions. Fort Rupert was predicated upon a metaphysics of property and an attendant regime of property rights that allowed foreign individuals and bodies to possess colonial land. Vancouver Island was established as a colony of the Crown in January 1849, to be governed by HBC. The granting charter required the Company to create permanent settlements on the Island, and it was subject to review and cancellation after five years if its conditions

were not satisfactorily met. By the summer of 1849, James Douglas, later a colonial governor of Vancouver Island, had been empowered to dispossess the Aboriginal Peoples of uncultivated "waste" land around Fort Rupert (Bowen, 1987), although Douglas would sign two treaties for the region in 1851 (Duff, 1969).

As an economic arrangement concerned with the accumulation of wealth, the colonization of Vancouver Island was established under what's known as the Wakefield system, developed by the political economist Edward Gibbon Wakefield. The use of Wakefield's model on the Island was generally regarded as a mistake by its settler-colonists, "whatever their affiliation with the company," who "viewed the system devised in London as a hindrance to settlement and commercial development" (Mackie, 1992, p. 4). A prominent HBC physician, John Sebastian Helmcken, recalled that the first governor of Vancouver Island, Richard Blanshard, thought that the system was a "mere theory, sure to fail in practice" (1975, p. 285). The Wakefield schema was based upon agricultural accumulation. It was, however, to be implemented on an island in which arable land was in short supply, by a company whose economic operation upon that land accrued wealth from trade and soon-to-be industrial modes, although agrarian accumulation was common in the former Columbia District south of the 49th parallel.

The Wakefield model also established high land prices for colonizers. As the historian Richard Mackie has written, high prices meant that most colonial subjects were required to perform wage labour. "The whole scheme depended on the presence of agricultural land, on a steady flow of wealthy emigrants in search of land, and on the presence of landless immigrants willing to engage in wage labour for the landowners" (1992, p. 9). European class relationships between capitalists and propertyless workers were, in this way, transmitted to Vancouver Island through the economic structure of the colonial project. Marx, whom Mackie cites, also identified this aspect of Wakefield's thought. "Wakefield's theory of colonization," he wrote in volume 1 of *Capital*, "which England tried for a time to enforce by Act of Parliament, aims at manufacturing wage-labourers in the colonies. This is what [Wakefield] calls 'systematic colonization'" (Marx, 1990a, p. 932). The colonization of Fort Rupert thus progressed with distinctions among workers further cleaved by their relationship to property: landlessness as a condition of European wage labour and dispossession for Indigenous workers.

The latter was a necessity for capitalist social relations to emerge and develop through mineral extraction on Vancouver Island. The appropriation of uncultivated land and the adoption of systemic colonization allowed a specifically capitalist logic and social organization to emerge. Coal mining on the Island was to precede through European control of minerals, over which HBC was given monopoly in the 1849 charter. Prior to the introduction of European miners in fall 1849, HBC had bought coal from Kwagu'ł miners around the area that would become Fort Rupert (Codere, 1966, p. 22; Douglas & Work, 1979, letters of December 1846, p. 5). The dispossession of Indigenous Peoples' land at the north end was not, however, simultaneously the dislocation of Kwagu'ł mining techniques and local knowledge. Kwagu'ł miners were employed by HBC after the 1849 colonial grant, their coal pit never fully appropriated by the Company, and Kwagu'ł were also paid by HBC to scout mining locations. Two days after arriving at Fort Rupert in the fall of 1849, the Scottish miner Andrew Muir was

part of a group that included local Kwagu'ł workers searching the northeast coast of the Island for a workable coal seam. "Mr. Wark of Fort Simpson Mr. Muir Manager for Coal Work McGregor and I along with some Indians [*sic*] started in a canoe after dinner in the direction of McNiel's Harbour to examine the coast for the most eligible place to commence operations at the coal …" (Muir, 1849, p. 85). Indigenous knowledge and skill were subsumed within an emerging colonial-capital relationship, mediated by a wage, but this subsumption was tentative and required a redefinition of property rights, accomplished through the Crown grant of Vancouver Island.

Interestingly, there appears a potentially significant transition in the historical record concerning the price at which HBC purchased coal from Kwagu'ł miners, possibly reducible to formal control over the resource itself. In her introduction to a collection of letters from Fort Victoria, 1846–1851, the historian of British Columbia Margaret Ormsby noted that "[b]y the time of the miners' arrival at Fort Rupert, the Indians [*sic*] had collected 750 tons of coal at the cost of 3s. 6p. a ton. For every two tons collected they were paid one [small HBC] blanket" (1979, p. lviii). Douglas and John Work, on the other hand, wrote in December of 1846 that HBC "can purchase Coals from the Indians [*sic*] at about ten shillings a ton …" (1979, p. 5). The 1846 price, cited by Douglas and Work, was almost three times that of the 1849 price that Ormsby identifies, without account being made for blankets. By 1849, however, the organization of the Island coalfield was, at least formally, dictated by HBC, after the Company had been granted monopoly rights over the mining of coal. Remarkably, 10 shillings per ton of coal was roughly equivalent to the price paid for certain English coal purchased within 10 miles of a pithead around the mid-nineteenth century. "Defined as 10 shillings or less per ton, the area of cheap coal remained confined to some 15 to 20% of Britain and Wales" (Malm, 2016, p. 160). Further afield, in Wales and the south of England, 1842–1843, 20 shillings per ton was the most common rate, while between 10 and 20 shillings predominated in the Midlands up to Scotland (von Tunzelmann, 1978).

Under formal HBC control, Kwagu'ł miners produced about 1,200 tons of coal in the 1849 mining season (according to an 1850 letter by Douglas, 1979b, p. 84), although sustained or higher outputs were unlikely moving forward without the introduction of different methods, per Douglas. The surface outcroppings contained undesirable slate and, in any event, would not yield a suitable quantity of coal, as Douglas came to believe by the end of 1850 (Douglas, 1979c). Worried also that Kwagu'ł miners would be unable to work at depth for profitably-capitalist mining, the Company imported miners from Scotland, accustomed to techniques of deep subterranean mining.

The transition to a specifically capitalist form of coal mining on the Island, organized by HBC, which was to displace the trade with Kwagu'ł miners, was motivated by the emergence of a mid-century network for the circulation of written material in the Pacific. On November 23, 1848, Douglas reported that he had signed an agreement with Captain William C. Stout, an agent for William H. Aspinwall and Company of New York. HBC was contracted to supply one thousand tons of coal to Aspinwall's Pacific Mail Steamship Company. The coal would be taken away from the Fort Rupert area by Aspinwall for the price of 50 shillings per ton of coal (Douglas, 1979a, p. 18). HBC would supply the Pacific Mail Steamship Company with coal for one year, with

the first 300 tons provided on or before May 1, 1849, the remainder no later than May 1, 1850.

Although indirectly, the American state motivated the trade between HBC and the Pacific Mail Steamship Company, subsidizing Aspinwall to distribute mail in the eastern Pacific. Aspinwall entered an agreement with the federal government in 1847 to provide mail service along the Pacific coast of the Americas, from Panama to the Oregon Territory, with service obligated to begin October 1, 1848. Transmission of the mail would occur through a fleet of coal-burning steamships, the *Oregon*, *Panama*, and *California*, each "about 1,000 tons burden and 200 feet in length, with side paddle-wheels driven by side-lever engines" (Kemble, 1938, p. 123).

Letters from the period demonstrate Aspinwall's dissatisfaction with the company's existing Welsh network and a desire for alternative coal sources. Prior to the arrival of the first Scottish coal miners to Vancouver Island, Simpson encouraged HBC's Board of Management at Fort Vancouver to expedite the Company's acquisition of coal.

> [T]he U.[S.] Mail steamers from San Francisco may require coal earlier than it can be provided by the operations of the miners about to be sent out, I have to beg, you will use your utmost endeavours, by the formation of a post, the employment of Indians [*sic*] or otherwise to provide with the least possible delay and have placed in the most convenient spot for shipment from 500 [to] 1000 Tons of Coals, or as much more as can be collected. (quoted in Kemble, 1938, p. 126)

Similarly, on December 22, 1848, one month after Douglas and Stout signed on behalf of their firms, Aspinwall wrote that:

> We would also like to order at once another vessel sent from the Columbia River or Oregon City or any other point in that neighborhood, to the new post at the mines on Vancouvers island [*sic*] consigning her to the agents of the Hudson Bay [Co.] to be loaded to your address. (quoted in Kemble, 1938, p. 127)

Despite its apparent intensity, the relationship between Aspinwall and HBC would be short-lived. HBC encountered and produced an impressive number of obstacles to the successful operation of coal mines at Fort Rupert, and the surface coal collected in the area proved an unsuitable ancillary to the external-combustion steam engine powering maritime travel and trade. The unfulfilled implication of Fort Rupert within an international network for the transmission of written communication nevertheless marks the origin of capitalism on Vancouver Island. Fuelling transportation and communication became a business of HBC and Vancouver Island.

HBC was largely unprepared to manage industrial production, despite its establishment of capitalist property rights and social relations through Wakefield's system and colonial grant. On the coast, the Company had previously been primarily invested in commercial—rather than industrial-capitalist—forms of wealth accumulation, specifically the buying and selling of pelts without a large working class producing commodities as wage labourers. Douglas had worked to diversify Fort Vancouver for decades before coming to Vancouver Island, and he was familiar with the goals of di-

versification (Mackie, 1992); however, fur remained qualitatively dominant for HBC. Following Simpson's course, Douglas "directed the search for coal and gold; he promoted markets for salmon, timber, spars, and shingles" (Bowsfield, 1979, p. x). Diversification developed to varying success among western forts. While many in the interior failed to be self-sufficient, Fort Langley, along the Fraser River, successfully exploited salmon for export (Ormsby, 1964). Yet the accumulation of value through the mass extraction and sale of coal required a level of development previously absent on the Island. In a telling 1846 letter, Douglas wrote apprehensively of HBC's prospects shortly after the Company became interested in mining coal. Given HBC's "total ignorance of mining operations the project may perhaps terminate in failure and disappointment," he advised (Douglas & Work, 1979, p. 5).

On Vancouver Island, the mining of coal from seams deep under the earth involved a transformation in the *nature* of the operation in which value is created. The implications of this shift were in many instances lost on HBC management. Major incompetencies discovered by historians of Vancouver Island coal mining include the signing of contracts in Britain that did not reflect the conditions of mining on Vancouver Island and the Company's misrecognition of hierarchy within the labour process of mining coal (Bowen, 1987; Burrill, 1987). Both, it has been argued, fostered labour unrest at the northern fort, and the weight of HBC's missteps would ultimately lead it to abandon Fort Rupert for the coal mining community of Nanaimo, farther south on Vancouver Island.

One incompetency of the Fort Rupert operation that has so far escaped the view of historians is the role of underdeveloped transportation networks. Only one other colonial settlement on Vancouver Island existed between 1848 and the founding of Nanaimo, and Fort Victoria sat at the very opposite end of the roughly 460-kilometre-long island from Fort Rupert. Steamers, barques, and brigantines ran between the two forts, but other travel around the Island was less straightforward. Transportation of workers and tools from one potential mining site near Fort Rupert to another was notably arduous, presenting a significant financial problem for the Company, as no workable seam had been discovered prior to the arrival of Scottish miners, other than that controlled by Kwagu'ł miners.

Coal is compressed and degraded vegetation from previous millennia. It is found in seams of varying depth beneath the earth, sometimes breaching the topsoil or tidal waters. While HBC knew that extensive coal seams existed in and around Fort Rupert, finding these seams would involve trial and error and therefore the transportation of workers and tools. In the absence of extensive road or rail networks HBC transported worker and tool by ships, which became costly as the holes its workers dug into the earth failed one after another to result in a productive coal seam. Canoes could be used for travel over some distances but presented a problem for farther explorations. In a letter regarding coal at Quatsino Sound, some 30 kilometres southwest of Fort Rupert by land but hundreds of kilometres by sea, Douglas writes to Victoria and London in August 1851 that he "ought to remind and at the same time remark, that the transportation of men and implements from Fort Rupert can only be effected by sea, and will put the Company to considerable expense" (Douglas, 1979d, p. 208).

HBC would never discover a workable seam for high-volume output at the north end of the Island, with the Company's exploration hampered by the high cost associated with inadequate transportation networks. When coal was discovered in Nanaimo, by contrast, it was in great quantities adjacent to a spectacular natural harbour. The coal seam, called the Douglas seam, was moreover accessible from several different locations. The movement of miners and their tools for exploration posed little problem to mining at Nanaimo, unlike Fort Rupert. In the absence of a means of transportation and communication developed to support capitalist production, HBC incurred the costs associated with the transportation necessary for its production of the energy commodity. The insufficient means of transportation meant considerable expenses had to be shouldered by producers—not a problem at Nanaimo.

The containment of the means of communication and transportation within the means of production on Vancouver Island recalls insights from Dallas Smythe (1977), Raymond Willams (2005), and Mattelart (1996), commonly cited in our field. There appears a dialectical twinning of production with communication and transportation, in which the former, though primary, requires the latter to proceed. At Fort Rupert, difficulties finding coal, coupled to high costs associated with exploration as well as multiple incompetencies on the part of HBC officials, contributed to the view that the coal field recently discovered at Nanaimo was more promising. Other incompetencies that arose from HBC's oversight of industrial production demonstrate that underdeveloped transportation systems around Fort Rupert cannot be said to have *primarily* caused the failure of the mining community. Nevertheless, they contributed. Wakefield himself seems to have identified the need for "improved water and road communication" in Canada years before the Colony of Vancouver Island was established (Prichard, 1986, p. 48).

In the mid-nineteenth century, flows of people and commodities, dictated by capitalist imperatives, were restricted by inadequate transportation networks at the north end of Vancouver Island. Although a colonial-capitalist regime of property rights was established at the outset of 1849, the contingent, non-designability of naturally occurring, subterranean coal seams hampered extraction through a lack of sufficient transportation networks to aid discovery. Coal from Fort Rupert was an expected, if unrealized, ancillary of information distribution in the mid-nineteenth-century Pacific. This network, in turn, acted as an impelling power in the emergence of capitalist production on Vancouver Island and ultimately, therefore, BC. In the early years, Nanaimo coal would power naval, Company, and merchant ships, allowing for the expansion of nation states and capital. Vancouver Island coal would increasingly power the development of California, as the second half of the nineteenth century progressed. In 1885, for example—long after HBC had sold its mining operation to London investors in 1862—224, 298 of the 365,596 tons of coal produced in BC went to California, and BC collieries were the state's largest suppliers of coal.

If fuel and transportation were implicated in the establishment and failure of Fort Rupert, the question of whether a transportation-focused approach to communication may support problems of energy remains unanswered. Drawing from the work of Marx and Malm, the concluding section puts forward a theory of energy in which fuel is

contained in the means of transportation/communication, and in which the production of commodities and the development of transportation networks for commodity circulation are co-developmental.

Energy capital

Both Innis and Marx produced materialist approaches that may usefully underpin a political economy of what I term as *energy capital,* a theory that means to locate the production, circulation, and consumption of energy within communication studies. The Marxian narrative, nevertheless, provides the more compelling framework for this theory. In the fuelling of capitalism in the eastern Pacific, Innisian problems of granular materiality and empire may be better addressed at the level of class and capitalist development. The establishment of a new metaphysics of property and property rights at Fort Rupert allowed the relationship of capitalist owner and property-less worker to travel from Europe to Vancouver Island, promoting social forces better captured by Marxian materialism.

The development of an extractive industry for coal on the Island would follow the emergence of written communication networks and, later, the California market and other buyers. Fuel extraction and circulation was subsequent to expansions in production and circulation more generally. Malm's recent book *Fossil Capital* (2016) has tied the emergence of steam power in Britain to the maturation of class struggle in the Island empire; it provides an obvious touchpoint for the development of a theory of energy capital. Although magisterial, Malm's theory of fossil capital requires extension to be of interest to us in communication. Malm suggests as much in a reference to his forthcoming study of mobile steam-power, *Fossil Empire*. *Fossil Capital's* concern is, strictly, with steam power in the production of commodities. Yet nineteenth-century maritime circulation would be radically enhanced by the acceptance of steam power, just like industrial production in Britain.

Burned as part of the external-combustion steam engine, coal was, for a time, an ancillary aspect of manufacturing and transportation. Its function as fuel for producing power is simple. Ignited coals boil water to create steam, which powers mechanical motion then manipulated to produce movement outside of the engine itself. The transmitting mechanism is immaterial to the process of combustion and does not concern us.

As coal became the preferred energy source of mechanized capital, more of it was mined to satisfy demand, its production and consumption coming into deeper relation. "One appears as a means for the other, is mediated by the other," Marx wrote in his *Grundrisse* notebooks, "this is expressed as their mutual dependence; a movement which relates them to one another, makes them appear indispensable to one another, but still leaves them external to each other" (1993, p. 93). Coal, gas, and other energy-producing materials are depleted in production, fulfilling their socially constituted purpose by providing power toward the completion of a commodity, be it in primary, secondary, or tertiary form, but the energy commodity is itself something that is also produced. As William Hebblewhite (2015) notes, raw materials used up in production are, in Marx's estimation, already themselves the *result* of production, and the extraction of fossil fuel is therefore subject to most of the same laws and contingencies as

other forms of production. As something produced, the energy commodity reflects the historical level of development. Energy is both an ancillary productive force (Marx, 1992) and an expression of the state of production. As singular aspects, raw materials nevertheless exist relative to other forces of production. The widespread acceptance of the coal-burning steam engine in nineteenth-century manufacturing and shipping implied accelerations in the extraction of coal.

Although the problem of fuelling the production of goods is not particular to any one moment of development, the economic tendencies that seek expanded and reproducible methods for appropriating surplus value are unique to the capitalist mode of production. In *Fossil Capital*, Malm showed that the use of fossil fuels in commodity production became generalized during the nineteenth century. Coal had been burned for millennia; its use predates capitalism and industrial production. To locate the origins of mass coal consumption in the private practices of individuals and small groups would, however, universalize what is a historically-particular problem (Malm, 2016). It assumes what needs to be explained by "mistak[ing] capitalists for humans" (p. 264). What is important about the consumption of coal, and where this consumption impacts us today, was its use by capital to power production. Yet, in industrializing Britain, the necessity of coal was not found in its flammability; rather, its mobility set coal apart. Malm showed this through a comparison to the technology surpassed by fossil-produced steam, the waterwheel.

In the early nineteenth century, water was known to be a more effective and inexpensive producer of horsepower than steam. However, the relative immobility of flowing water, high fixed-capital costs, and coordination among capitalists needed to develop infrastructure for water-derived horsepower rendered coal the more practical fuel. After it left the pithead, coal could be transported to areas in which reserve armies of proletarians lived. Moving workers to an isolated countryside, in which water could power production, would mean a small group of proletarians could express solidarity against capital without easy dismissal, at least *en masse*. To escape the demands and intransigence of proletarians in the countryside, capital found a power source available to the city, Malm showed.

The primary contradiction that led to the widespread acceptance and use of coal in the production of commodities was, therefore, found in the relationship between capitalists and workers. Coal was not only an ancillary of production and object of production itself, it suggested methods for disciplining workers that water did not. The steam engine became a political technology to limit the power of workers, a technology of class struggle from above. "The establishment of a normal working day is … the product of a protracted and more or less concealed civil war between the capitalist class and the working class," Marx wrote in *Capital*, volume 1 (1990a, pp. 412–413), to which Malm adds that "[s]team won because it augmented the power of some over others. It was considered invaluable for the great assistance it provided in the struggle between antagonistic subsets of the human population" (2016, p. 267).

If coal was ancillary and the result of production while reflecting class struggle, Malm's estimation of its position in nineteenth-century circulation is unclear before the publication of *Fossil Empire*. The following paragraphs, therefore, propose an ex-

panded form of fossil capital to account for circulation generally and at Fort Rupert specifically. We can at this point return to Marx, recalling that the relationship between production and circulation means that each makes appearances in the development of the other. Production and circulation proceed under historical conditions that are by no means fixed: the circulation of commodities shifts from the dominant form of wealth creation to a subordinate yet co-developmental aspect of production during the modern period, Marx argued. While the production process requires it, circulation is no longer the prevailing sphere of value creation in mature capitalist production. More succinctly put: "In the stages that preceded capitalist society, it was trade that prevailed over industry; in modern society it is the reverse" (Marx, 1991, p. 448).

The transition to capitalism is therefore characterized, *inter alia,* by a shift in the status of transportation as it relates to the creation of value. Both Marx and Malm render the shift as formulae. Capital proceeds by transforming money into commodities, which is then sold for more money than was put into the process at its beginning. The money used to produce a commodity is divided into two portions: the outlay for the means of production and that for labour power. "The two sets of purchases pertain to completely different markets: one to the commodity market proper, the other to the labour market" (Marx, 1992, p. 110). These two aspects come together in production to create a finished commodity, which realizes the initial outlay in sale. The ancillary material coal, which is consumed in production, is contained in the purchase of the means of production. "Resources are withdrawn from nature and placed into the hands of workers as means of production to be applied, refined, worked up" (Malm, 2016, p. 283). Malm expanded Marx's equation into what he calls the General Formula for Fossil Capital. The novelty of Malm's formula is the introduction of the energy ancillary as something consumed in production, with ramifications for the global climate. His equation means to account for the fallout of fossil-fuel combustion, and *Fossil Capital* will proceed to identify the weight of well over a century of steam-powered production borne by the planet.

Malm, however, treated the capitalist form of transportation too narrowly in *Fossil Capital*, relegating it to personal consumption. Transportation appeared as a personal form of fossil fuel consumption, rather than an ancillary of commodity circulation. As Marx recognized, commodity production needed the advance of transportation networks to expand. Production required circulation for profit to be realized on a reproducible basis. "The process that creates this greater sum of value is capitalist production; the process that realizes it is the circulation of capital" (Marx, 1991, p. 132). Nineteenth-century maritime shipping records support Marx's assertion. The economist Luigi Pascali (in press) has recently, if tentatively, argued that the reduced shipping times that followed the widespread acceptance of steam-powered motion in maritime trade may have been responsible for *half* of the increases in global circulation in the second half of the nineteenth century. Through an impressive series of data sets, Pascali shows that by 1875, shipping times were completely determined by steam, instead of sail, whereas the previous 15 years allowed for shipping times of both. Untethered from wind power, trade routes became more expedient for circulative capital, supporting the advances of steam-powered production begun earlier in the century.

We may, therefore, impose the means of communication and transportation upon Malm's general formula. As circulation is increasingly powered by fossil fuels during the second half of the nineteenth century, it becomes permissible to treat the consumption of fossil fuels in circulation. Like production, fossil fuels are an ancillary material of circulation, used to power the engines of transportation.

Energy capital, as distinct from Malm's fossil capital, foregrounds the role of energy in commodity circulation. Malm has already identified in enviable detail the rise of fossil fuel use in British production and the conditions for acceptance of the steam engine in its factories. Drawing from insights found in Marx, it seems proper to extend his equation to include the sphere of circulation. Doing so establishes a political-economic basis for the study of energy production and circulation within the field of communication.

Conclusion

Communication studies in Canada will benefit from attention to the problems of energy production, circulation, consumption, and the power relations that generate and sustain these phenomena. This intervention is less a necessary enrichment of the field philosophically than an attempt to identify a blind spot in the political economy of Canadian capitalism as it is developed in the field of communication. Energy production has indeed been important to Canadian development and the exercise of power by the British, the Canadian state, and capital operating on and underneath the land before and after Confederation.

While energy capitalism has largely been ignored in Canadian communication, other problems of circulation have been central to our materialist analyses. Both Karl Marx and Harold Innis furnish communication with methods that the Canadian tradition might use to develop the study of energy and transportation. However, Innis' well-known failure to address issues of social class suggests that Marx is the more appropriate theorist if the study of fuel in communication is to take seriously capitalism as a coherent economic system, based on structural difference and exploitation.

This article offers such a study, applying a Marxian transportation-focused approach to communication to the short-lived existence of the colonial mining community at Fort Rupert on Vancouver Island. The inability of mercantile HBC to identify that transportation inhered in capitalist mineral extraction promoted the failure of the mining community. In the absence of established routes to transport workers and their tools, costs associated with the exploration and discovery of coal were shouldered by HBC, supplementing the extant incompetencies of a mercantile firm attempting capitalist organization at a remote outpost of empire. Additional transportation-focused approaches to fuelling communication would do well to attend to questions of energy production and circulation as epiphenomena of capitalist development.

Notes

1. There are, of course, basic differences between the transportation of commodities and that of language. Oral/aural media mobilize different resources and reflect different class alliances and biases than other forms of communication. Collapsing transportation media into oral/aural would obscure more than it would illuminate.

2. This tendency is not exclusive to communication studies in Canada, though Canadian communication studies is the focus of this article. Raymond Williams' (2005) justifiably lauded essay "Means of Communication as Means of Production" treats transportation alongside "printing and electronic industries" (p. 53), as aspects of communicative production.

3. An interesting, though rarely remarked upon, exception to this comes from Innis' late-in-life *Empire and Communications* (2007), in which the development of writing appears to emerge from established professional and ruling-class relationships.

4. A conversation with Liam Cole Young at the 2016 Canadian Communication Association conference in Calgary helped me to see this. I also borrow Young's use of the term "granular" to describe Innis' materialism.

5. To choose a handful of wildly different (though by no means exhaustive) applications of Innis in Canadian media theory: Ian Angus (1998) has read the discursive turn in the social sciences and humanities against the materiality of media, or Innisian media theory. He discovers the constitution of social relationships by the technology of language. Robert Babe (2015) has argued that Innis' historical analysis of media, especially at the end of his life, attempted to reveal universal principles applicable to his conservative dialectic, which tends toward balance. Liam Cole Young (2016) locates the beaver in Canadian history as a site of cultural techniques, in which the economic activity surrounding the pelt trade produced infrastructures and institutions Canadian development would be patterned upon.

6. In *The Invention of Communication*, Mattelart (1996) notes the use of *Verkehr* in volume 1 of *Capital.* The complexity *Verkehr* works against readings of *Capital* that intend to discover the present, more limited, notion of communication therein, Mattelart believed. On the relationship of historical materialism and communication and media studies, see Fuchs (2014). On problems of technology in recent Marxian media studies, see Greaves (2015).

7. On Vancouver Island, telegraphy would indeed follow rail. The contract to build a railway from Esquimalt in the south to Nanaimo, about one-quarter of the way north on the Island, had the builder construct and maintain a telegraph line along with those of steel.

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