

A User of What, Exactly?
Infrastructures of Energy Transition and Planetary Digital Subjectivity

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I was five or six and impatient. My father told me my toy was on a truck, and that Manny, our street's UPS driver, would leave it in the lobby soon. I was unsatisfied, so my father explained the in the most expansive way he knew how, with a flowing supply-chain diagram: factory, warehouse, boat from China, warehouse, train, truck, our front door...then (a happier) me. When I began this project, though, this memory eluded me. Then, I was far away from the network. I was researching lightweight and ephemeral structures, enamored of their visual grace and material economy. As I leapt around in those early stages, fascinating and incongruous links between subjects kept appearing, pulling me far off whatever path I had planned to plod down before. Suddenly, it struck me that a truly evanescent structure might lack mass altogether—it might be virtual. The network and its logic of unseen connection became my object of inquiry, and, with a little good fortune, the Leif Erikson Cable presented itself to me as an example *par excellence* of the tension between abstract, homogeneous virtual space, and the particular physical paths which traverse it.

I should make myself clear to you: I am not comfortable with the pervasiveness of the virtual world in life today. The sheer volume of information hidden within and between inscrutable machines unnerves me. Sometimes, I have wished that the omnipresence of this computation would become subliminal again; that I could go back. But rather than attempt to wrangle the cloud's boundlessness with a hairsplitting and overwrought quantitative investigation, as I had once imagined doing (for the sake of a narrow and half-baked conception of academic rigor), I have taken a humanist approach to studying the global network, a process I have found to be therapeutic. It, I hope, allays your unease as it has mine.

To do this, I have conducted an experiment in writing the network, through form and content. The body of the project has two halves: acceleration and deceleration. Between them lies a point of inflection. In the first half, I accelerate to keep pace with the network's ever-expanding scope. Then, this investigation's deliberate escalation of the network's anxious drama—more data, faster than ever—pivots. I decelerate, descending in careful steps which bring the network to down to a particular geography, a particular physical form, and to particular people. Below the cloud is Earth.

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Abstract

This project traces the historical and aesthetic contours of the relationship between the ongoing energy transition, the growing data center industry, and the formation of a reconfigured “user” as a planetary subject, through the Leif Erikson Cable (LEC), a renewable-energy powered fiber optic system currently under construction between Norway and Labrador. While telecommunications and computing have always produced the virtual subject we call the internet user, I argue that it is only as these infrastructures adapt to the changing climate through projects like the LEC that the materiality of the global network has become palpable to the virtual subject, and thereby reconfigured them from user to planet-user. First, I trace a genealogy of the planet-user through literature, art, and architecture, which reveals their descent from Romantic and utopian ideologies of mobility derived from the Roma and other nomads, as manifest in the contemporary figure of the digital nomad/“gypsy”. Then, in a process I term “deceleration,” this project grounds the planet-user in their materiality through a series of “strata” which investigate the motley local infrastructures of Labrador that support the LEC with similarly varied historical and contemporary documentation. Departing from the ample critical infrastructure studies literature about internet materiality, this project uses a single geographic path to provide a cross-sectional view of the interdependent and increasingly physical socio-energetic infrastructures which produce the virtual subject.

keywords: critical infrastructure studies, genealogy, archaeology, energy transition, data center, climate adaptation, Canada, First Nations, Roma/gypsy, digital nomad

Act One: Tension

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PROLOGUE

Arrival in Canada



Image 1

The renewable giants, 0:56.

Peder Nærbø, founder of Norwegian telecommunications and industrial real estate company Bulk Infrastructure AS, stands beside the rain-slicked intersection of Quebec City’s Rue de Traversiers and Rue du Marché-Champlain, facing the St. Lawrence River. Against a steely sky, the city’s iconic Château Frontenac hotel peers proudly from behind the already-autumnal July foliage. He is pitching his company’s latest venture, the Leif Erikson Cable, a subsea fiber optic link currently under construction between Kristiansand, Norway and Goose Bay, Labrador, a town 676 miles northeast of where he stands. There are hundreds of similar cables which cross the Atlantic, but to date no others which are powered by exclusively renewable energy.¹ “So,” he concludes his pitch, “if you want to be *smart* about how we manage global energy resources, we

¹ Bulk Infrastructure, “Leif Erikson Project.”

need to enable ways for data processing to happen in these regions.”² Nærbø’s conclusion sounds cogent, but neatly evades defining “smart.” What exactly must we be smart about, and how?

Climate change and digitalization, he says elsewhere. According to Nærbø, it is Bulk Infrastructure’s corporate mission to address these two “global megatrends,” an aspiration being made concrete in the form of the Leif Erikson Cable, which the company intends to facilitate a “great migration” of data centers to Quebec and Labrador.³ Because it is accelerating, it is “smart” for Bulk Infrastructure to invest in climate change, and smarter still to invest in climate change *through* digitalization. But what about the actual cable infrastructure they are building?

Infrastructure is typically understood as the systems which serve a society, be they institutions and laws, or the physical structures which provide sewerage, transportation, and electricity—each of which have their own internal (infra-)infrastructures as well. In the current “material turn” in scholarship, interest in infrastructure has surged, and as such, definitions have proliferated, hothoused by the climate crisis. Infrastructure is, variously, the promise of modernity, an anthropological tool for defamiliarization, and a technology for dividing and oppressing populations.⁴ Infrastructure’s ambiguous relationship to humanity is reflected in Nærbø’s description of his company’s cable, which he claims serves “global trends” through migratory data centers.

Does the Leif Erikson Cable, then, transmit data for the sake of data itself? Not exactly, Nærbø suggests. Rather, the cable transmits data to Labrador (“these regions”) in order to “manage global energy resources.”⁵ In other words, he purports that his cable is a crucial part of a network which is capable of “managing” the globe by means of its very form: it physically ensnares a globe

² *The Renewable Giants*, 0:56. Emphasis mine.

³ *Creating Sustainable Solutions*, 0:30; *Leif Erikson Cable System*, 0:22.

⁴ Anand, Gupta, and Appel, *The Promise of Infrastructure*, 3, 4, 5.

⁵ *The Renewable Giants*, 0:56.

in its net of fiber optics. Yet, in the same breath that Nærbø invokes the omnipotent, globe-spanning network, he denies it: he states that it is only with “energy resources,” which are only found in specific “regions,” that the network can attain such power.⁶ Though couching himself in saccharine business jargon, Nærbø admits that the abstractions ‘globe’ and ‘network’ have repressed the importance of the planet and its materiality. Together, the Earth has come back to haunt its bodiless masters as the “global megatrend” of accelerating climate change.⁷

Finding The Network Subject

But to whom is Nærbø speaking? You, a user of data.⁸ You, the one watching him on YouTube—or rather me, studying him there. Of course, he speaks not only to the 106 who have seen this promotion at the time of writing, but to every user—a plural ‘you’ for the plural users of the network around the globe for whom every subsea cable and data center exist.⁹ If digitalization really is one of just two major contemporary phenomena (“megatrends”) as Nærbø says, then this *user* must be the avatar of the time to which his audience belongs, just as the nineteenth century had its railroad *passenger* and the twentieth had its *viewer* and *driver* in that era of television and automobile efflorescence.¹⁰ Alongside the user, though, another compelling candidate for the role of contemporary avatar is *Homo economicus*, the human species of neoliberalism which acts in

⁶ *The Renewable Giants*, 0:56.

⁷ *Creating Sustainable Solutions*, 0:30. “The global need for data processing has made data centers to one of the most power hungry industries in the world. Today’s source of power has made it create similar greenhouse gas emissions as the airline industry. At Bulk Infrastructure, we want to create sustainability as a business, and we want to create solutions to this problem. That is why we focus on the two global megatrends: the climate change and digitalization.”

⁸ *The Renewable Giants*, 0:56. “So, if *you* want to be smart...we need to enable ways for data processing to happen in these regions [emphasis mine].”

⁹ Of the 106, many are me, if the view-counting algorithm works that way.

¹⁰ *Creating Sustainable Solutions*, 0:30; Schivelbusch, *The Railway Journey*, 14; Crary, “Art After Modernism,” 289. These two past avatars are characterized in depth by these two authors.

ways that “enhance its portfolio value in all domains of life.”¹¹ While in one sense, this avatar effectively diagnoses the conditions of our time, the user more clearly embodies the spatial and material difference between neoliberalism today and neoliberalism at the end of the 20th century: for the user, there is the real possibility to be virtual, to dwell in the globe-spanning network, unlike *H. economicus*.

This project posits that the user is a neoliberal subject parallel to *H. economicus*, not a replacement. However, some poststructuralist theorists have proposed that the user *does* replace the individual known as *H. economicus* as the neoliberal subject by turning them into a “dividual” (Deleuze) that exists only as a composite of streams of “big data” (Bratton).¹² Although the user is certainly an amorphous subject suffused with “extrinsic flows” of information that exceed human agency, as Bratton notes, this project sees his expanded definition of the user as largely speculative.¹³ Despite everything he proposes the user *could be*, most users can in fact be mapped to people, people who are engaged in the material, social world: they are corporate executives, lawyers, and infrastructural engineers, to name a few. As a social subject, the user has an implicit morality. While for *H. economicus* relentless self-investment and credit score optimization are the prime virtues, the user is best when they participate as much as possible in the global network.¹⁴ Both subjects, though, have a simple deontology of growth that must only look forward, never backward or to the present.

¹¹ Brown, *Undoing the Demos*, 33.

¹² Deleuze, “Postscript on the Societies of Control,” 5: “Individuals have become ‘dividuals,’ and masses, samples, data, markets, or ‘banks’”; Bratton, *The Stack*, 271: “The visual outline of the User perforates and liquefies because the biological apparatus itself comes to observe its own becoming from the temporal perspectives of the inhuman forces congealing to give it form. Looking inward from the outside, the somatic *homo economicus*, especially the one reflected in the mirror of big data, burns brightest in the sharp relief of its own extinguishment.”

¹³ Bratton, *The Stack*, 271.

¹⁴ Brown, *Undoing the Demos*, 33; Hu, *A Prehistory of the Cloud*, 50–51: “[the] failed user, the user that doesn’t participate or produce content, represents the queer stoppage of technological (re)productivity.”

Who's Beyond The User?

If Nærbø addresses his pitch to this purely immaterial user of the global network, then why is he so prominently in Canada? The chill grey sky, the already-autumnal July foliage, and the zipped raincoat signal that the subject of his pitch is not exactly the user. Rather, this subject is the *planet-user*, a close relative of the pure user as yet defined. This is a user who is defined by the contemporary climate crisis, who is, in some capacity, aware of their position between the globe and the planet. While the user has always been undergirded by material infrastructure in the form of telecommunications cables, data centers, and electricity grids, among many others, only recently in the planet-user has a consciousness of these real infrastructures begun to dawn for the virtual subject.

The planet-user is caught in a double bind. Simultaneously, they must participate as a user in the growth-oriented global political economy of ever-lighter, ever-accelerating “liquid modernity,” and also address the ongoing “triple planetary crisis” of climate change, air pollution, and biodiversity loss.¹⁵ To make sense of the planet-user’s contradiction, this project investigates with a bivalent approach: it traces the ideological lineage of the planet-user with the method of *genealogy*, while it also tracks their geospatial materiality with an *archaeology* of the network.¹⁶ Through these two methods, I will trace the spatial and temporal consequences of the planet-user’s means of escape from their double bind—which they do in the figure of the digital nomad or digital gypsy. But before we put genealogy and archaeology into practice to find this figure of escape, it

¹⁵ Bauman, *Liquid Modernity*; “What Is the Triple Planetary Crisis? | UNFCCC.”

¹⁶ See methods section for more. “Genealogy” is borrowed from Michel Foucault’s essay “Nietzsche, Genealogy, History,” and “archaeology” from Nicole Starosielski’s *The Undersea Network* concept of “network archaeology.”

behoves us to introduce Labrador, where Bulk Infrastructure is building the renewable energy-powered cable they see as the future of the global network.¹⁷

¹⁷ *Creating Sustainable Solutions.*

FOREGROUND

Like writers of all projects, my position relative to my subject informs what I produce. The following is a brief account of what lies in the foreground, between me and the subject of this project, the energy transition and planetary digital subjectivity.

Labrador, Churchill Falls, and (Hydro)electricity



Figure 1:
Location of Labrador within Canada.
from Wikimedia Commons

Collectively, the province of Newfoundland and Labrador is more than half a million strong, but only 28,000 live on the Canadian mainland in Labrador itself. Though European observers have consistently characterized Labrador as cold and empty, the province, along with Quebec, contains most of *Nitassinan*, the home of the traditionally nomadic Algonquin-speaking

Innu and Naskapi.¹⁸ The namesake of Bulk Infrastructure’s cable, Leif Erikson, was the first European to witness Labrador (and the Americas, in general): he was a Norse-Icelandic explorer, who in about 1002 AD called the region *Markland* (“forest land”) in reference to its abundant timber.¹⁹

A millennium later, the forests remain, but the province is now the site of Churchill Falls Generating Station (CFGS), the largest hydroelectric generation station in Canada, built between 1967 and 1974. It produces thirty-five trillion watt-hours of energy each year, more than three times Toronto’s annual demand, which puts it among the ten largest in the world, which include China’s Three Gorges Dam and Brazil/Paraguay’s Itaipú Dam.²⁰ Unlike these dams, though, Churchill Falls is not such an obvious mark on the landscape. Rather, its powerhouse is buried more than a thousand feet under its reservoirs (about one Eiffel Tower), with eleven penstocks to feed it high-pressure water which it discharges into the Churchill River a mile downstream.²¹ Figures 2–4 below illustrate the plant’s reservoir network and the organization of the generating station itself.

¹⁸ For European observations, see Bryant, “A Journey to the Grand Falls of Labrador,” 4; Smith, *Brinco: The Story of Churchill Falls; Leif Erikson Cable System*; “New Town for Churchill Falls”; For Innu understanding of Labrador, see Innu First Nation, “Pepamuteiati Nitassinat.”

¹⁹ Wernick, *The Vikings*, 149–51.

²⁰ Estimate based on data from the following sources. Assuming 1,160,890 households in Toronto with average electricity consumption of 29.7 GJ/year, which equates to 9.57 TWh. City of Toronto, “2021 Census: Families, Households, Marital Status and Income (Backgrounder),” 2; Statistics Canada, “Households and the Environment Survey: Energy Use, 2019,” 1; Kirong, “China’s Three Gorges Dam Sets World Hydropower Production Record – China Daily”; “Brasil retiró casi 92 millones MWh de la producción récord de Itaipú - Economía - ABC Color.”

²¹ “Churchill Falls - Technical Specifications.”

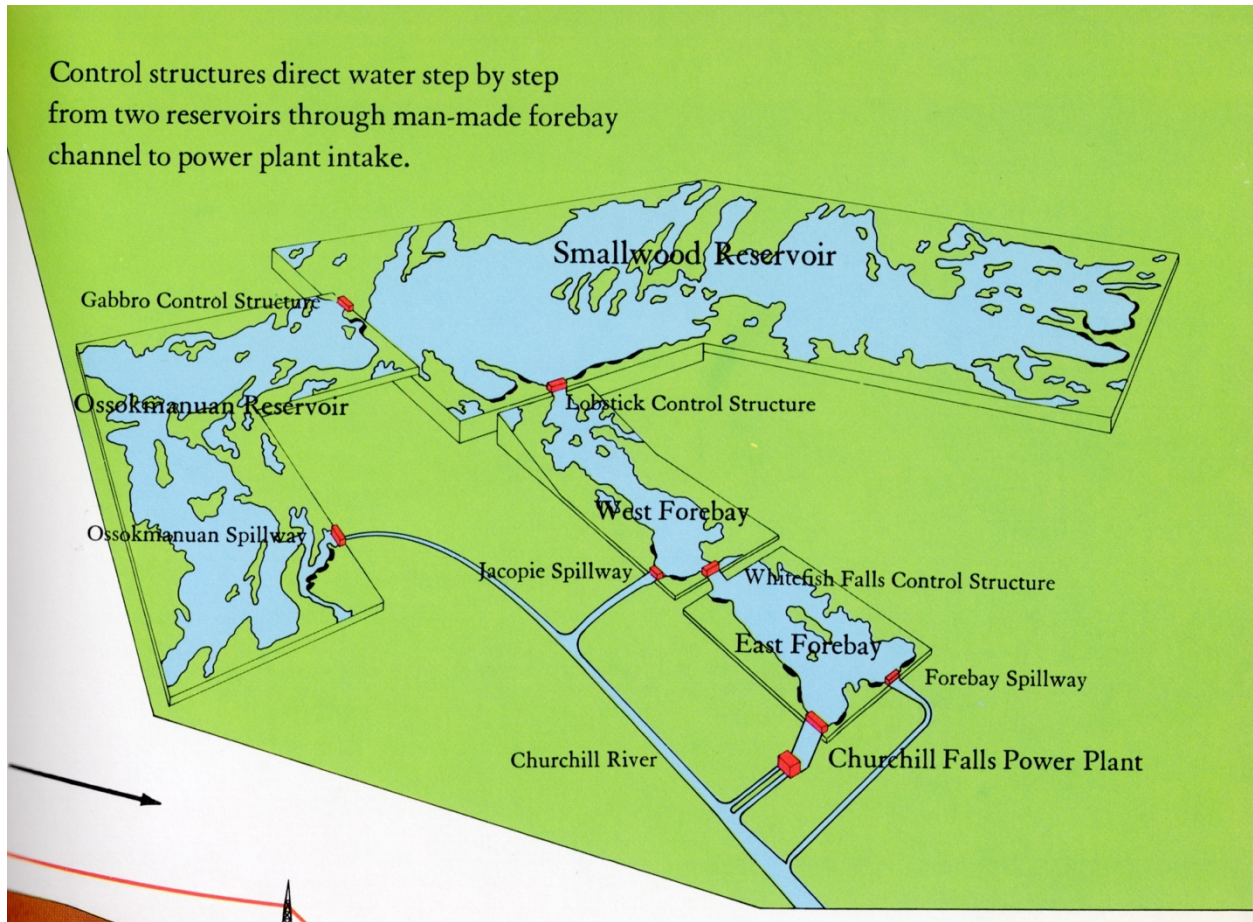
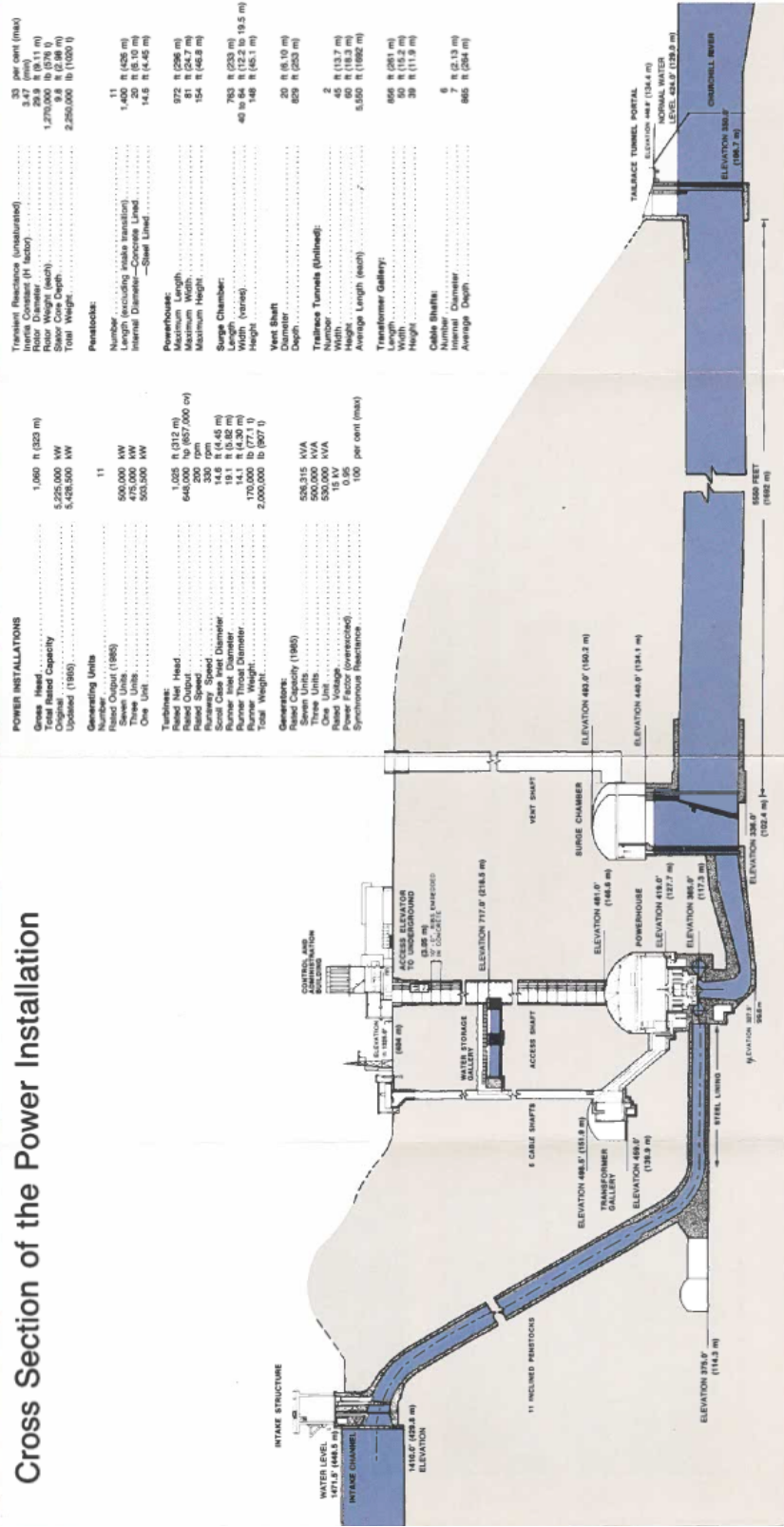


Figure 2:
 Diagram of the network of reservoirs which supply CFGS with falling-water power.
 from *Brinco: The Story of Churchill Falls*, page xv

Cross Section of the Power Installation



POWER INSTALLATIONS	
Case Head	1,080 ft (329 m)
Total Rated Capacity	5,225,000 kW
Original	5,128,000 kW
Updated (1985)	5,128,000 kW
Generating Units	11
Number	11
Rated Output (1985)	500,000 kW
Seven Units	475,000 kW
Three Units	500,000 kW
One Unit	500,000 kW
Turbines:	
Head	1,058 ft (322 m)
Rated Output	648,000 hp (487,000 cv)
Rated Speed	200 rpm
Surge Speed	14.6 ft (4.45 m)
Runner Inlet Diameter	19.1 ft (5.82 m)
Runner Throat Diameter	4.1 ft (1.25 m)
Runner Throat Area	13.3 sq ft (1.23 sq m)
Total Weight	2,000,000 lb (907 t)
Generators:	
Rated Capacity (1985)	526,315 kVA
Seven Units	500,000 kVA
Three Units	500,000 kVA
One Unit	500,000 kVA
Rated Voltage	15 kV
Power Factor (overexcited)	0.95
Synchronous Reactance	1.05 per cent (max)

Transient Reactance (unsaturated)	33 per cent (max)
Inertia Constant (H factor)	3.7 (sec)
Rotor Weight (each)	1,270,000 lb (574 t)
Stator Core Depth	9.8 ft (2.99 m)
Total Weight	2,250,000 lb (1020 t)
Penstocks:	
Number	11
Length (excluding intake transition)	1,400 ft (426 m)
Internal Diameter—Concrete Lined	20 ft (6.10 m)
—Steel Lined	14.5 ft (4.42 m)
Powerhouse:	
Length	972 ft (296 m)
Maximum Width	81 ft (24.7 m)
Maximum Height	154 ft (46.8 m)
Surge Chamber:	
Length	763 ft (233 m)
Width (varies)	43 to 64 ft (12.2 to 19.5 m)
Height	148 ft (45.1 m)
Vent Shaft:	
Diameter	20 ft (6.10 m)
Depth	829 ft (252 m)
Tailrace Tunnels (Unlined):	
Number	2
Width	45 ft (13.7 m)
Height	60 ft (18.3 m)
Average Length (each)	3,550 ft (1082 m)
Transformer Gallery:	
Length	665 ft (202 m)
Width	39 ft (11.9 m)
Height	39 ft (11.9 m)
Cable Shafts:	
Number	6
Internal Diameter	7 ft (2.13 m)
Average Depth	665 ft (202 m)

Figure 3: Cross section of CFGS complex.

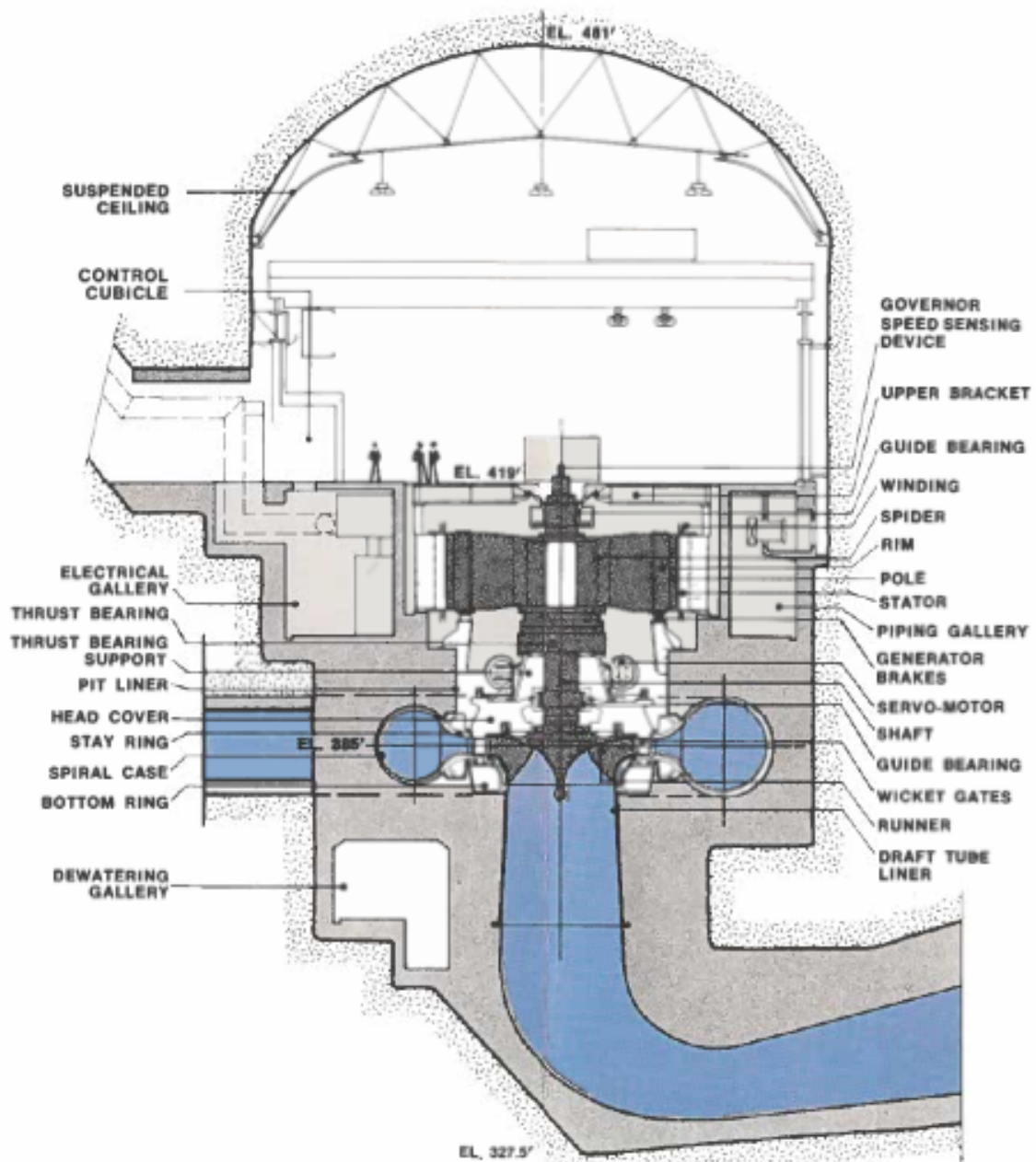


Figure 4:
Close-up of the cross section of the turbine.

Both cross-sections (complex and turbine) from an informational brochure about Churchill Falls, courtesy of Memorial University of Newfoundland, St. Johns.

Despite the immense generation capacity of the Churchill Falls project, relatively little of its electricity powers the infrastructure of internet users, who have relied disproportionately on that of energy-poor but strategically located places like Hawai‘i and Guam for the transmission of their data, according to historian Nicole Starosielski.²² Both islands generate electricity with proportionally more petroleum than mainland grids as a result of their distance from fossil reserves and their histories of militarization, which has favored importing refined fuels to meet demand that was (and is) greatly influenced by aircraft and naval consumption.²³ However, as pressure mounts to switch from fossil to renewable energy, the geography of the network appears to be shifting to favor nodes like Labrador, where energy is inexpensive and low-carbon.

Although Bulk Infrastructure promotes Labrador and Norway as “the renewable giants,” these regions are far from the only places on Earth with abundant renewable energy. But unlike solar- and wind-generation-heavy regions like California, Texas, and Germany, among others, Labrador’s generation capacity is mostly at Churchill Falls.²⁴ The sun rises and sets daily, and the wind rises and falls in multi-day cycles, but hydroelectricity—if properly managed—can deliver an uninterrupted and controllable supply of electricity that can even be ramped up quickly, if necessary, by opening additional penstocks, spillways, and turbines.

For data centers and subsea cables, it is imperative that they always remain on, which demands power redundancy usually in the form of on-site diesel generators. Accordingly, a reliable grid is “mission-critical,” in industry lingo.²⁵ While there has been significant research and even

²² Starosielski, *The Undersea Network*.

²³ US Energy Information Administration, “Hawaii State Profile and Energy Estimates”; US Energy Information Administration, “Guam Territory Profile and Energy Estimates.”

²⁴ Ritchie, Rosado, and Roser, “Electricity Mix”; California Independent System Operator, “California ISO - Supply, Today’s Outlook”; Electric Reliability Council of Texas, “Fuel Mix”; Das Statistische Bundesamt, “Bruttostromerzeugung in Deutschland.”

²⁵ Hu, *A Prehistory of the Cloud*, 54; Mandal et al., “A Survey and Critical Analysis on Energy Generation from Datacenter,” 203; “Home.”

commercial investment by Texas “power orchestration” company Lancium in leveraging the swings in electricity generation of wind and solar for flexible or intermittent computations, this inchoate technology is still far from supplying always-on, “mission-critical” computing capacity.²⁶ Until storage technology improves immensely, the only energy source which is reliable and “green” enough to constantly supply Bulk Infrastructure’s data centers and subsea cable is hydroelectricity. Despite its geographic distance from recognizable centers of computation, Churchill Falls has become an unlikely chokepoint for, to recall Nærbø, climate change and digitalization, as these two converge in the ongoing transition away from fossil energy.

The Dark Side of Green: Inundation, Dispossession, and Pollution

However, Labrador’s hydroelectricity has a dark side which extends far beyond current energy concerns, from a violent colonial past to contemporary pollution. Although it does not have the prominent retaining wall of other large dams, CFGS nonetheless flooded thousands of square miles of Innu hunting grounds and burial sites, non-prey animal migration routes, as well as literally stopping the flow of Churchill Falls itself, an important site in Innu mythology.²⁷

²⁶ Lancium, “Solutions”; Yang and Chien, “Large-Scale and Extreme-Scale Computing with Stranded Green Power,” 1114.

²⁷ Innu Nation, “Statement by Innu Nation on Prime Minister Trudeau’s Planned Visit to Newfoundland and Labrador and Speculation on Potential Hydro-Related Announcements,” July 27, 2021; Innu First Nation, “Pepamuteiati Nitassinat”; Denes and B. A., “Environmental Impact of Flooding in the Main (Smallwood) Reservoir of the Churchill Falls Power Plant, Labrador, Canada. III. Environmental Impact Zones and Direct and Indirect Changes.”

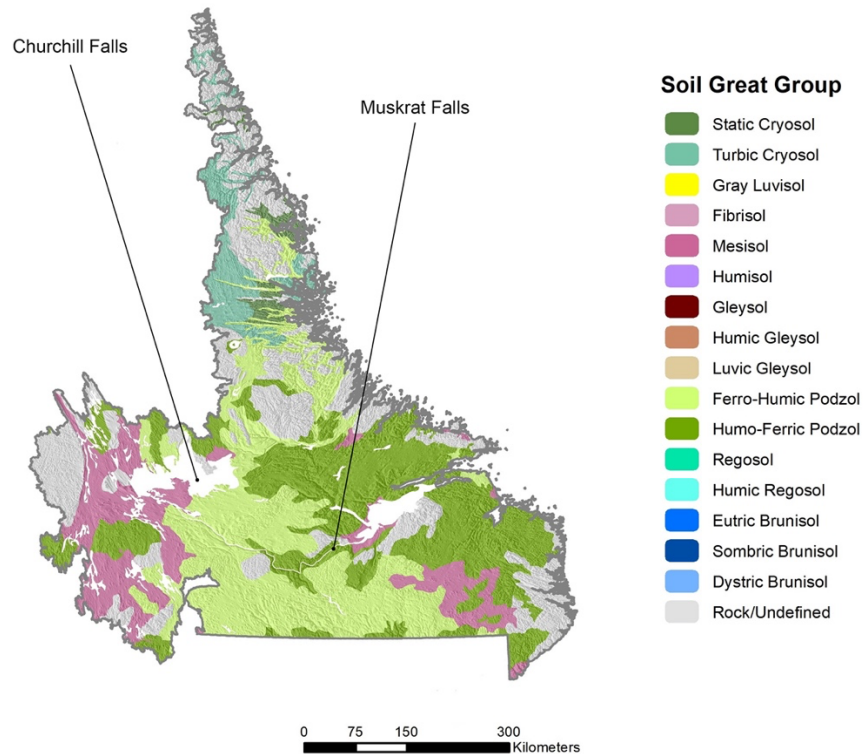


Figure 5:
 The soils of Labrador. The two shades of green indicate podzol soils,
 which are ubiquitous in the watersheds of Muskrat Falls and Churchill Falls.
 Extracted from Heung et al., “Soils of the Atlantic Provinces”

In addition to these macroscopic damages, a 2016 study about the environmental impact of an unpopular new generating station downstream of Churchill Falls, Muskrat Falls, demonstrated how flooding reservoirs stimulates microbes to produce neurotoxic methylmercury, a reaction which is especially intense in the carbon-rich boreal podzol soils of Labrador (see Figure 5 above).²⁸ Although such a study was not performed for Churchill Falls, there is, due to the similar

²⁸ Innu Nation, “Statement by Innu Nation on Prime Minister Trudeau’s Planned Visit to Newfoundland and Labrador and Speculation on Potential Hydro-Related Announcements,” July 27, 2021; Richardson, “Innu of Labrador Launch \$4B Lawsuit against Hydro Quebec”; Calder et al., “Future Impacts of Hydroelectric Power Development on Methylmercury Exposures of Canadian Indigenous Communities,” C.

soils of East and West Labrador, reason to believe that the creation of the CFGS's reservoir network had similarly insidious effects on the long-term health of Labrador's Innu.²⁹



Image 2:
A hunter raises his son to live from the land as he has,
which the presence methylmercury would make untenable.
From *Hunters & Bombers*, 37:50 (1990).

Labrador has not only been estranged from the Innu at the level of the surface and soil below it, but even by the very air above it. Goose Bay, the Canadian terminus of the Leif Erikson Cable, was established in 1941 as a military base used by the Royal Canadian and United States air forces.³⁰ Housing 5,000 military personnel at its peak, the base was in active use as a refueling point during WWII, but remained busy through the Cold War as a NATO training site for low-altitude bombers which was chosen to avoid disturbing other environments.³¹ Spoiling hunting grounds with their ear-shattering noise and ordnance pollution, these training flights were the breaking point for the political mobilization of the Innu, who had only twenty years early lost so

²⁹ Heung et al., "Soils of the Atlantic Provinces."

³⁰ Pitt and Pitt, "Happy Valley-Goose Bay."

³¹ Pitt and Pitt, para. 4; Hedican, *Ipperwash*, 103–5. According to Hedican, "the West German government had been promoting the low-level flights in Labrador as a means of protecting the German environment."

much due to the Churchill Falls project. In 1988, they staged an occupation of Goose Bay AFB's runways, which received national and international attention.³² Together, the dispossession and pollution caused by the Churchill Falls project and Goose Bay AFB now disturb Bulk Infrastructure's narrative that Labrador is a "clean" and "green" energy utopia.³³ As a region with some of the cheapest and most stable renewable energy in North America, Labrador has an outsized role in greening the U.S. and Canada's electricity supply. If the province, by way of the Churchill Falls project, is recruited to this continental, transoceanic, and even global future, so too is the contested legacy of its troubled history.³⁴



Images 3 and 4:

A jet flies low over the forests of Labrador, almost too fast to see. According to Lt. Colonel Philip Engstad: bombers "don't use the land per se, [they] overfly it in the air."

From *Hunters & Bombers* (1990), 0:06 and 41:10–41:35.

In order to continue Labrador's story, I want to first return to the subject *for* whom this green future is primarily imagined: the user, in both their global and planetary dimensions. This "planet-user" requires richer geographical, historical, and theoretical context in order to make sense of how Labrador mediates their emergence.

³² Hedican, *Ipperwash*, 105; *Hunters & Bombers*.

³³ *Leif Erikson Cable System*.

³⁴ Paddon et al., "Canada and US First Nations Unite Against Hydro-Québec."

APPROACH, through literature

Caught between the opposing demands of ever-digitalizing globalism and the planetary crisis, the planet-user must formulate a mode of escape. Here, I use *genealogy* to interrogate the intangible ideological aspect the planet-user's escape, while I use an *archaeology* to investigate its concomitant material implications. But before I can outline the mechanics of these two components of the project's bivalent approach, I must explain the dual space of the planet-user: globe and planet.

Globe and Planet

Perhaps unconsciously, Bulk Infrastructure provides a compelling account of the planet-user's dual space:

So, if you want to be smart about how we manage global energy resources, we need to enable ways for data processing to happen in these regions.³⁵

To Nærbø, the globe is manageable, its regions energy-rich, energy-poor, hot, cold, stable, or unstable. It is smooth and unoccupied. Unintentionally, his account of the globe mirrors that of critical theorist Gayatri Spivak: "The globe is on our computers. No one lives there. It allows us to think that we can aim to control it."³⁶ Although the globe is colloquially synonymous with Earth, Spivak is a reminder of just how different they are. Unlike its spherical model, whether digital or tabletop, the Earth is full: its volume is saturated by people, rivers, languages, dirt roads, airstrips, mines, and LLCs. The full list would be immense; a Borgesian correspondence between it and

³⁵ *The Renewable Giants*, 0:56.

³⁶ Spivak, "Planetarity," 72.

Earth itself would ensue. Though imagining the planet like this is overwhelming and maybe impossible, Spivak urges us to do it anyway, precisely *because* it is so estranging. Only by facing the planet's alterity, as she puts it, is it possible to counter the notion that humanity merely exists upon a controllable, immaterial globe.³⁷

In this view, the globe is a product of the planet, separated from its maker by everything inexplicable and unruly it leaves behind in the process of filtration. The globe proudly distinguishes itself from flatter maps, but it merely preserves shape and size, losing everything earthy. Yet, the globe is made real through its reflexive relationship with the planet. In saying it is possible to “manage global energy resources,” Nærbø suggests that these resources are as fungible as tokens on a spherical *Catan* board, even though he has gone out of his way to promote the *particular* climatic advantages of Labrador, Canada for energy production and data processing.³⁸ As such, the energy resources he speaks of are some of the points on Earth where globe and planet meet—landscapes where it is clearest that one is harvested by and for the other.³⁹ Bulk Infrastructure's mission to address climate change and digitalization through renewable energy-powered cloud computing is, in essence, the effort to establish the globe as cloud software and the planet as cloud hardware.

How might we investigate these two regimes of space, both essential to the production and reproduction of the planet-user? What kind of methods trace not only the particular qualities of these spaces, but the relations between them? The distinct but complementary approaches of genealogy, on the one hand, and archaeology, on the other. Genealogy tracks digitalization: it

³⁷ Spivak, 72–73. “When I invoke the planet, I think of the *effort* required to figure the (im)possibility of this underived intuition. . . . If we imagine ourselves as planetary subjects rather than global agents, planetary creatures rather than global entities, alterity remains underived from us; it is not our dialectical negation, *it contains us as much as it flings us away.*” Emphasis mine.

³⁸ *Millions of Creeks; Into the River.*

³⁹ *Leif Erikson Cable System, 0:05*: “The energy we can harvest from the region of Atlantic Canada is second to none, both on wind and hydro.”

lets me first acknowledge that digitalization is a historical process, and secondly that this process not only occurs through infrastructure, but also through a subject, the one who *is digitalized*. Archaeology, then, tracks climate change: it lets me address Spivak’s “planetarity” as a material condition, not just as an ideological one. But how do these methods work? Why do they work?

Genealogy

To write about the internet is to be “implicated in an intellectual quest that is not far from paranoia,” according to computer historian Tung-Hui Hu. Mark Wigley diagnoses this condition “network fever,” or the desire to see connection everywhere—a malady that can easily spiral out of control.⁴⁰ However, to simply ignore the internet’s metastatic interconnectivity in favor of studying a self-contained biopsy of its totality also seems improper to the subject at hand. Accordingly, to ‘write the network,’ this project must incorporate the network in both its content and form. Because text is linear and the network is not, this project adopts the strategy of *traversal*, tracing a line across the web, one node at a time.⁴¹

But without a procedure, a traversal can do little to clarify the network’s paranoia-inducing immensity, and, in turn, it cannot be an act of resistance to the power which the internet’s obscurity subtends. Genealogy, though, offers a way out—or through. Rather than engage in a futile search for the *origin* of a phenomenon (like this project’s planet-user) as a traditional causal history might, genealogy traces *descent*. In Michel Foucault’s words,

...[W]e should not be deceived into thinking that this heritage [i.e. history] is an acquisition, a possession that grows and solidifies; rather, it is an unstable assemblage of faults, fissures, and heterogeneous layers that threaten the fragile inheritor from within or from underneath...The search for descent [i.e. genealogy]

⁴⁰ Hu, *A Prehistory of the Cloud*, 10.

⁴¹ Starosielski, *The Undersea Network*, 10.

is not the erecting of foundations: on the contrary, it disturbs what was previously considered immobile; it fragments what was thought unified; it shows the heterogeneity of what was imagined consistent with itself.⁴²

Although the prologue seemed to favor designating the planet-user as ‘the contemporary avatar,’ this does not mean the (pure) user of the global network can be discounted: the planet-user has not sheerly *abandoned* the globe for the planet, but has rather assumed attributes of both regimes of space, material and immaterial. The planet, according to Spivak, is so expansive and unruly of an idea that it escapes even being truly conceived of.⁴³ The globe, though, presents itself as stable, obvious, inevitable: Foucault might say the globe is an idea “considered immobile,” “thought unified,” or “imagined consistent with itself.”⁴⁴ Unlike the planet, which is already a motley concept, the globe is the proper object of genealogy, for its pretension of solidity begs to be revealed as such. Genealogy allows us to interrogate the ideological affect of the planet-user and determine—aside from their obvious geographic dispersion—what exactly remains ‘global’ about the planet-user.

Archaeology

While genealogy offers a way into the globality of the planet-user, archaeology interrogates what is ‘planetary’ about this subject. I borrow this term from Nicole Starosielski’s *The Undersea Network*, which traces the geography of undersea telecom cables in the Pacific Ocean to investigate their relationship to empire, environment, and the cultural contexts of the islands they connect. For her, the archaeological approach “historicize[s] the movements and connections enabled by

⁴² Foucault, “Nietzsche, Genealogy, History,” 146–47.

⁴³ Spivak, “Planetarity,” 72–73.

⁴⁴ Foucault, “Nietzsche, Genealogy, History,” 147.

distribution systems [to] reveal the environments that shape contemporary media circulation.” Specifically, Starosielski does this by following the paths of the signals themselves from cable station to littoral to deep ocean, and back again.⁴⁵ By tracing the flow of signals, archaeology allows her to read cable infrastructure on its own spatial terms, rather than a traditional approach which would view cable geography as merely subordinate to that of state borders, for instance.

This does not mean Starosielski engages uncritically with the geography of the infrastructure she investigates, but just the opposite: seeing the network from the signal’s perspective attunes her even more to the cables’ social, environmental, and political entanglement with the movement of people and capital which laid them. Reading space in this way is strange, but that strangeness yields an almost etic awareness of just how idiosyncratic conventional modes of reading space are. An example she provides is how reading Fiji and New Caledonia as rival colonial possessions overemphasizes their differences, in comparison to the proximity visible from the transnational infrastructural perspective of the proposed South Pacific Islands Network (SPIN) in which they are adjacent nodes.⁴⁶ In addition to the new perspectives offered by infrastructure, they also mediate abstractions physically: she discusses how an increase in AT&T’s ‘bandwidth’ manifested as the ire of drivers on the narrow Farrington Highway of O‘ahu’s west coast which was blocked while another cable’s trench was dug under it.⁴⁷

While Starosielski conducts an archaeology of a single horizontal layer of network infrastructure, the subsea cable, Kate Crawford’s *Atlas of AI* and accompanying website *Anatomy of An AI* demonstrates the flexibility of this approach by applying it vertically to the lifecycle of an artificial intelligence model. She traces the fractal supply chains which source and convert, in

⁴⁵ Starosielski, *The Undersea Network*, 15. In Starosielski’s text, the complete term is “network archaeology.”

⁴⁶ Starosielski, 196.

⁴⁷ Starosielski, 163–64.

steps, Bolivian lithium and Indonesian tin into semiconductors, chips, batteries, software, and finally an artificial intelligence model itself.⁴⁸ Throughout her book, rich vignettes ground highly abstract ideas in specific examples: she illustrates the politics of data collection for algorithmic classification with an account of the fraught origins of the skull collection now stored at Philadelphia's Penn Museum, for instance.⁴⁹ In short, archaeology grounds abstractions.

The planet-user exists at the intersection of the globe and the planet, and as such, requires that genealogy and archaeology be intertwined to make sense of their bivalent space. However, they also function as methods to interrogate the *time* of the planet-user, which has so far only been said to be “the contemporary,” though further investigation reveals this to be a shaky account.⁵⁰ Though we have sketched the planet-user's means of escape from their double bind, a rich account of this escape emerges when we put genealogy and archaeology into practice in Act Two. However, to serve the intellectual and therapeutic aims of this project, archaeology must be deployed in a particular way to complement, rather than multiply, the fragmentation introduced by genealogy. But how, exactly? Perhaps by tracing energy to its source, tracking its progressively slower, rawer form until it is not possible to go further. In spite of Foucault, this method of *deceleration* stops at a foundation.

Deceleration

In lieu of performing the much-needed work of investigating the nuances of the internet's growing carbon footprint or studying the role of remote work in reshaping local housing markets,

⁴⁸ Crawford, *Atlas of AI*, chap. 1.

⁴⁹ Crawford, chap. 4. The beginning of the chapter recounts the pseudo-scientific cataloguing and measurement projects of 19th century craniologist Samuel Morton, whose results were instrumental in maintaining legal white supremacy in the U.S. His thousand-plus collection of skulls is stored in the Physical Anthropology Section of the Penn Museum.

⁵⁰ See subsection “The Network, The Nomad, and The Contemporary.”

this project proposes the method of *deceleration*. Energy is transformed at the intersection of different infrastructures, almost always from a more “raw” (material) form to a more “refined” (abstract) form. Intuitively, it would seem wrong to heat one’s house by opening too many tabs on their computer.⁵¹ Energy extracted becomes energy used, but by tracing this series of transformations in reverse, deceleration offers a way to see the material where there appears to be none. Deceleration brings the cloud to the ground by tracing the series of energetic transformations which make it possible for such an abstraction to exist.

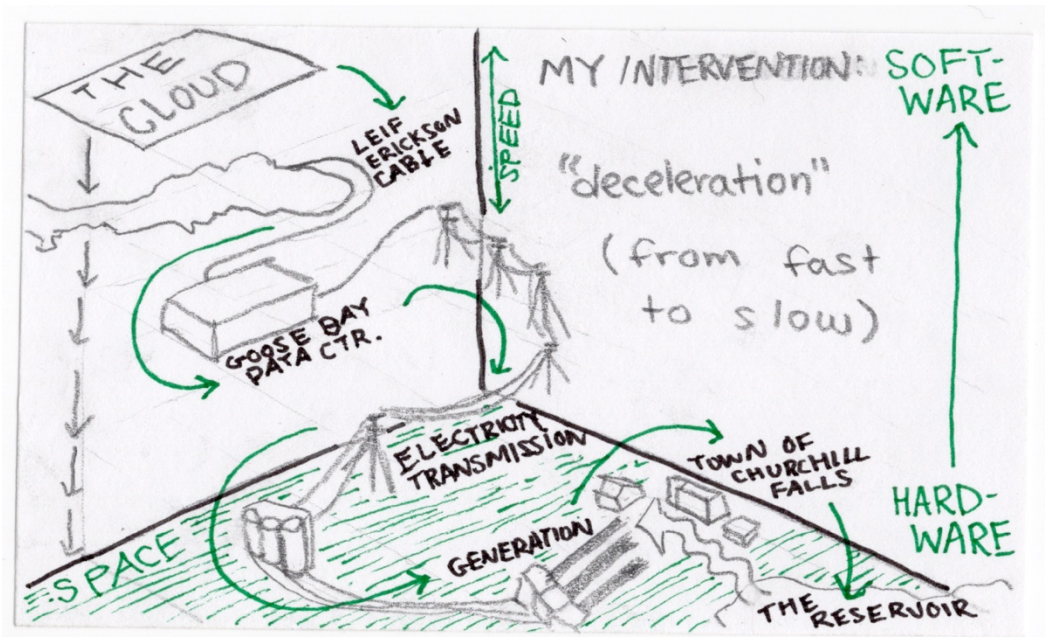
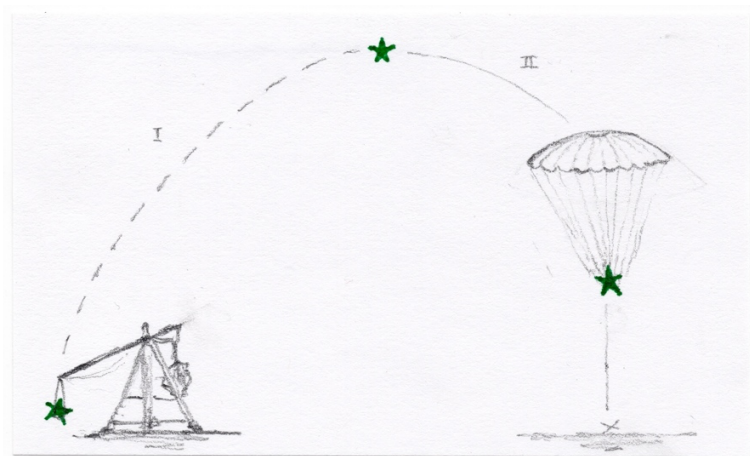


Figure 6:
Conceptual diagram of this project.

⁵¹ There has, in fact, been significant research done about the potential to harvest waste heat and energy from data centers. A report from fifteen years ago demonstrates the depth of this line of work: Darrow and Hedman, “Opportunities for Combined Heat and Power in Data Centers.”

As such, deceleration is a redeployment of archaeology. But deceleration is more than just a way to interrogate the metabolic quality of energy production and consumption.⁵² I am, and you are, a planet-user. If not yet, you will soon be as the energy transition takes place around the world. Accordingly, this project has a stake in the double bind of global political economy and planetary crisis which was outlined in the prologue—this project must *do something* to address this contradiction which is the source of so much angst today.⁵³ As was alluded to in the acknowledgements, this project deploys deceleration to implement a crucial observation from computer historian Tung-Hui Hu: that there is “a void in the apparatus of representation which cannot be filled by software tools, more data, or better algorithms.”⁵⁴ By taking a humanist approach to the global network, deceleration prevents us from merely replicating the network’s mode of exercising power, and in turn redoubling our anxieties about its scope.

At this point, the project is under tension. This is the precipice: its pent energy will soon be released. It will accelerate, propelled by genealogy, and reach a peak. Then, the reversal; a moment of hang. Archaeology will deploy, and it will decelerate to the ground.



⁵² Since its emergence in the late 1980s, the field of industrial ecology has concerned itself primarily with understanding the relationship between finite planetary resources and (sustainable) social and economic development. See Clift and Druckman, *Taking Stock of Industrial Ecology*, chap. Introduction.

⁵³ Dodds, “The Psychology of Climate Anxiety.”

⁵⁴ Hu, *A Prehistory of the Cloud*, 143.

Act Two: Release

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ACCELERATION: A Genealogy of the Planet-User

“We’re Tired of Trees”: *The Network as Liberation*

The planet-user is contemporary because they are defined by crisis—the double bind—unlike the pure user who is defined by optimism about the liberatory potential of the network. No term perhaps encapsulates the promise of a global network than ‘rhizome,’ which was coined in 1980 by poststructuralists Giles Deleuze and Félix Guattari to describe plant root systems and pack behavior in eusocial animals like rats, which they saw as topologically distinct from hierarchical tree-like structures.⁵⁵ They posited that “any point of a rhizome can be connected to anything other, and must be,” which crucially distinguished rhizomes from the centralized trees they derided, where branches must connect at the trunk.⁵⁶ By 1992, though, Deleuze’s optimism about the liberatory potential of the rhizome had waned.⁵⁷ Where he had once seen a way out of the constriction of bureaucratic hierarchy, he now saw a form of social control that was diffuse and individualized: the “self-deforming cast” of a credit score, rather than the discrete “enclosures” of the old order, like race, sex, or class.⁵⁸ Increasingly networked computing was the undercurrent to

⁵⁵ The high-countercultural prestige of this term is evident in the name of an important organization for the conservation and commission of digital art, affiliated with New York’s New Museum, which is called ‘Rhizome:’ Rhizome.org, “Home”; Deleuze and Guattari, *A Thousand Plateaus*, 6; Miller, “The Postidentitarian Predicament in the Footnotes of *A Thousand Plateaus*.” Miller takes issue with Deleuze and Guattari failure and/or lack of interest in critically evaluating the sources they use. Especially in their chapter about nomadism (“Nomadology: The War Machine”), Miller illustrates the radically un-rhizomatic colonial anthropological sources they use to critique those very forms of bureaucratic “arborescent” power.

⁵⁶ Deleuze and Guattari, *A Thousand Plateaus*, 7.

⁵⁷ The first edition of *A Thousand Plateaus* (French: *Mille plateaux*) was published in 1980, though Brian Massumi’s English translation I cite was not published until 1987. Deleuze’s essay “Postscript on Societies of Control” was published in 1992.

⁵⁸ Deleuze, “Postscript on the Societies of Control,” 4.

this thinking: what worried Deleuze more than the rhizome's actual forms of control was the possibility of "a computer that tracks every person's position" to make this control possible.⁵⁹

The next year, the internet became public.⁶⁰ In turn, interpretations of the allegedly rhizomatic global network mushroomed into the popular political consciousness—and diverged from Deleuze's dismal diagnosis. In 1994, The Progress and Freedom Foundation (PFF), a libertarian think-tank with ties to Newt Gingrich, published a manifesto which sought to discredit the then-pervasive "information superhighway" metaphor for the internet, which its authors understood as a "bioelectronic environment that is literally universal," in contrast to the centrally-planned space of the highway.⁶¹ In this space—"cyberspace"—the PFF imagined decentralized, free-floating connections that would result in unlimited knowledge, efficiency, and freedom: liberation from the stratified, bureaucratic "Second Wave" industrial economy.⁶² Though possessed of different politics, both poststructuralists and the PFF were "tired of trees." and saw the rhizome as a means of escape.⁶³

While the PFF and the poststructuralists posed the rhizome as a liberatory spatial arrangement, neither articulated what form this constitutive freedom would take. Countercultural art and architecture, though, did. Indeed, it is with this strain of network thinking that we can begin to understand how the planet-user escapes their double bind culturally as well as materially.

⁵⁹ Deleuze, 7.

⁶⁰ Ring, "30 Years Ago, One Decision Altered the Course of Our Connected World."

⁶¹ Dyson et al., "Cyberspace and the American Dream."

⁶² Dyson et al.; Rosenbaum, "I.R.S. Clears Foundation Linked to Gingrich's Ethics Dispute." As the manifesto was written, from 1994 to 1995, the foundation paid to televise Newt Gingrich's "Renewing American Civilization" course at Reinhardt College, contributions which drew attention from the House Ethics Committee and the IRS in 1997. Quite apt to the subject of the manifesto, the subject of Gingrich's course was to make America an "opportunity society" rather than "welfare state."

⁶³ Deleuze and Guattari, *A Thousand Plateaus*, 15.

Materialities of the Liberating Network: Atelier Cyberspace, Ant Farm, and New Babylon

Since at least the time of PFF's manifesto, cyberspace has been virtual. However, in 1970, this could not have been further from the case: cyberspace was physical. In that year, two Danish artists working under the alias Atelier Cyberspace created physical installations that intended to "dissolve" spatial divisions like walls and windows to create free-flowing architectural environments.⁶⁴ Cyberspace meant open-endedness and liberation from barriers just as it would for PFF twenty-four years later, though for the duo this liberation was sensuous, organic: "We had this idea that sophisticated software might enable us to mimic the way in which nature creates products...All oak trees are oak trees, but no two oak trees are exactly alike."⁶⁵ Atelier Cyberspace would not be the only ones who imagined implementing the rhizome physically.



Image 5:
One of Atelier Cyberspace's *Sensory Spaces* (1970).
From the collection of Statens Museum for Kunst, Copenhagen.

⁶⁴ Lillemose and Kryger, "The (Re)Invention of Cyberspace," para. 12.

⁶⁵ Lillemose and Kryger, para. 23.

In the United States, the interstate highway system had radically increased the mobility of Americans by the 1960s, while the ubiquity of television enhanced the richness of communication across space which had not, until then, supported images. Groups of artists like San Francisco's Ant Farm and TVTV (Top Value Television) as well as Woodstock's Videofreex understood the expressive potential of the emerging telecommunications network. One project, Ant Farm's Truckstop Network, was imagined as a nationwide system of "access points" for "media nomads" where they could freely send and receive information while on the road in the form of television broadcasts and computing.⁶⁶

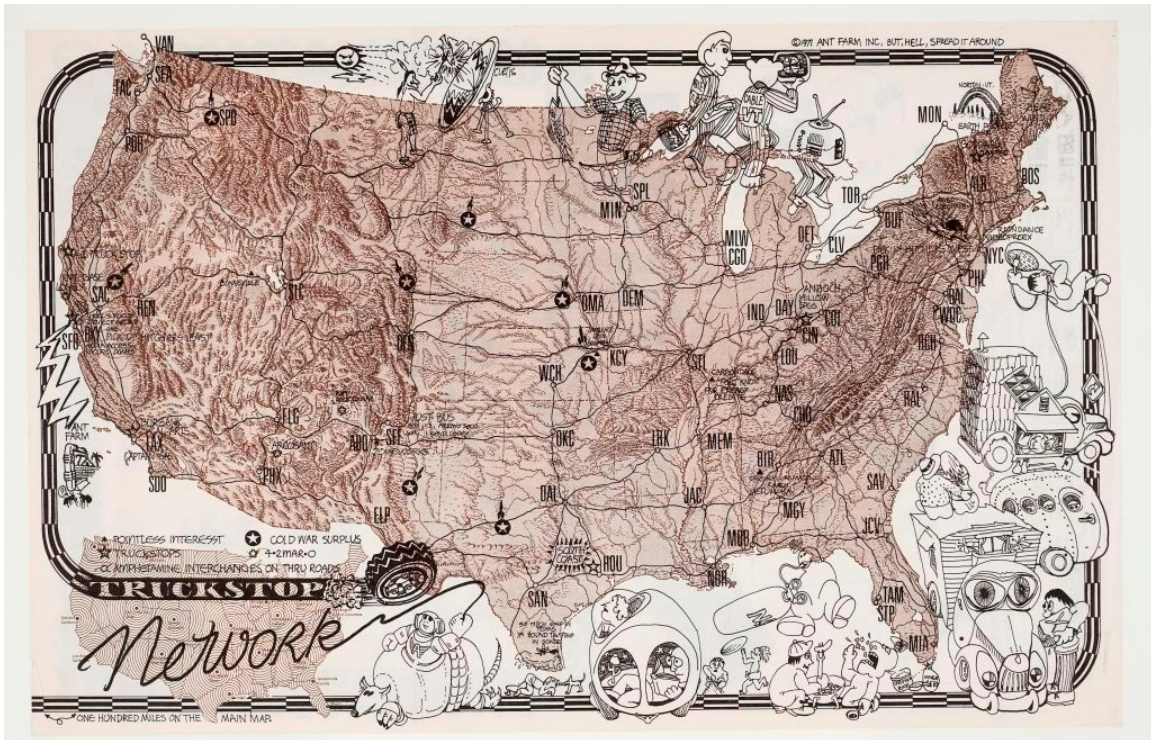


Image 6:
Ant Farm's Truckstop Network (1970).
From the collection of SFMOMA.

⁶⁶ Hu, *A Prehistory of the Cloud*, 28. Emphasis mine.

In the same period as Ant Farm’s physical interpretation of cyberspace, Dutch painter-turned-architect Constant Nieuwenhuys had a parallel vision of a material rhizomatic space *par excellence*. His utopian project, New Babylon, was composed of a globe-spanning network of megastructures called “sectors,” the interiors of which could be radically customized in form and in climate to accord with the desires of its inhabitants.⁶⁷ Constant understood this open-ended structure as necessary for humanity to fulfill its creative, playful potential as *Homo ludens*, who is free from work—he contrasts them to *H. faber* (“working man”), but *H. economicus* from earlier would do just as well.⁶⁸ Though gamification and game-theoretic rationality equip neoliberalism to capture play, these debased behaviors would have had no place in Constant’s utopian New Babylon, where utility only redounds to true play.⁶⁹

⁶⁷ Nieuwenhuys, “New Babylon,” 6, 9. In Constant’s words: “The basic elements of the network, the SECTORS, are autonomous units of construction, which nevertheless intercommunicate. The sector network is perceived from within as a continuous space. New Babylon ends nowhere (since the Earth is round); it knows no frontiers (since there are no more national economies) or collectivities (since humanity is fluctuating). Every place is accessible to one and all. The whole earth becomes home to its owners. Life is an endless journey across a world that is changing so rapidly that it seems forever other.”

⁶⁸ Nieuwenhuys, 2.

⁶⁹ For a typical illustration of gamification at work, see Hamari, “Do Badges Increase User Activity?”; For the relationship between games and economic rationality in the 20th and 21st centuries, see Amadae, *Prisoners of Reason: Game Theory and Neoliberal Political Economy*; Erickson, *The World the Game Theorists Made*.

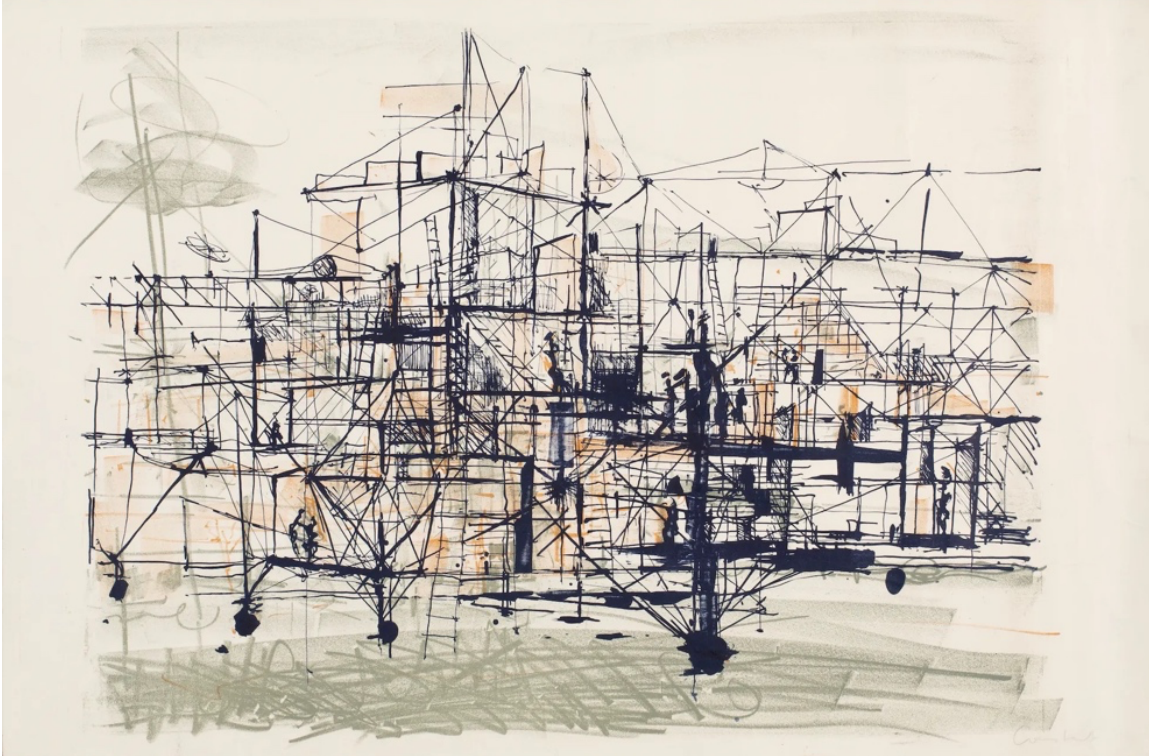


Image 7:
A 1961 sketch of New Babylon.
From the collection of the Academie van Bouwkunst Amsterdam.

Like the “dissolved” spatial divisions of Atelier Cyberspace’s installations, New Babylon was designed as a borderless utopia where “[e]very place [on Earth is] accessible to one and all.”⁷⁰ In this sense, New Babylon is a place to dwell without roots, as nomads are said to do.⁷¹ Art historian Tom McDonough situates New Babylon as a project which attempted to grapple with the great displacement of European populations after WWII, a problem which, at around the same time, philosopher Martin Heidegger proposed resolving through *Gelassenheit*. Translated as “open-endedness,” *Gelassenheit* means to accept the differences of our neighbors and yet respect the “mystery” of our encounters with these others.⁷² To Constant, no one embodied this openness

⁷⁰ Lillemose and Kryger, “The (Re)Invention of Cyberspace,” para. 12; Nieuwenhuys, “New Babylon,” 6.

⁷¹ Deleuze and Guattari, *A Thousand Plateaus*, 380; Nieuwenhuys, “New Babylon,” 1. Constant describes New Babylon as a “camp for nomads on a planetary scale.”

⁷² *Campo Nomadi*, 39:01–39:53. Translation courtesy of Jonah Estabrook, from a conversation on July 30, 2023.

to others better than *gypsies*, a chance encounter with whom informed the project directly. On a trip to Alba, Italy in 1956, he observed a Sinti Roma group hang their tents from the town market hall's rafters and repurpose barrels and planks left behind by the market to construct a dwelling, which they disassembled for the hall's livestock trade every Saturday. From this specific observation, Constant developed his material cyberspace as a “camp for nomads on a planetary scale.”



Image 8:
Mercato di Alba in 2006, though it has not changed since.
From Flickr user ritsch48.

The Network, The Nomad, and The Contemporary

In our search for the descent of the planet-user, the nomad and “gypsy” have emerged as the inhabitants of the network. While Nærbø addresses the planet-user in his promotion, and thereby casts the planet-user as the subject of contemporary virtuality, it stands to wonder: what kind of person is this planet-user? A *nomad*, it seems. Shocking though this may seem, according to the definition of genealogy, this method is liable to reveal “the heterogeneity of what was

imagined consistent with itself.”⁷³ As such, it should not, perhaps, be so surprising that this unexpected figure of the nomad embodies the planet-user, and in turn, that Nærbo’s cable is a technology of nomadism—though his company’s multinational capital *itself* certainly lacks the countercultural affect feigned by the planet-user. While the nomad may not feel “consistent” with a high-tech multinational investment like the Leif Erikson Cable or even with our notions of Labrador and Quebec, genealogy has nonetheless revealed the depth of their affinity, and in turn illustrated that present is interlaced with elements from the past and from the future.

So far, the planet-user has been posed as an essentially “contemporary” figure, but in the process of genealogy, it has become clear that the “contemporary” is not entirely coherent. While the blurry borders between historical periods like ‘medieval’ and ‘modern’ appear to indicate the folly of periodization, they in fact affirm that history is composed of successive ‘contemporaries’ which each constructed a specific relationship to the past and to the future.⁷⁴ Inevitably, these relationships result in the continuous flow between periods which historians observe and wrestle with. To be specific, any given present contains the past and the future in the form of residual and speculative elements that can be material or conceptual.⁷⁵ This year, for example, priests officiate weddings (residual-conceptual), racism animates politics (residual-conceptual), and the projected profitability of artificial intelligence motivates the actual design of new computer hardware at a company more valuable than Apple or Google (speculative-material).⁷⁶ The ‘contemporary’ of this project is no exception—it too is a hybrid of past and future elements. From the superficially incommensurable fields of nomad/“gypsy” cultural appropriation and Labrador’s cultural and

⁷³ Foucault, “Nietzsche, Genealogy, History,” 147.

⁷⁴ Williams, “Dominant, Residual and Emergent,” chap. 8; Bloch, “Nonsynchronism and Its Obligation to Dialectics”; Hensley, “Allegories of the Contemporary.”

⁷⁵ Koselleck, *Futures Past*, 233.

⁷⁶ “NVIDIA H200 Tensor Core GPU”; “Companies Ranked by Market Cap - CompaniesMarketCap.Com.”

environmental history, this view draws out their complementary, and sometimes overlapping lineages of dispossession.

At this depth, one thing is clear: the planet-user has a specific cultural affect, an affect rooted in the figure of the nomad and “gypsy” *as they have been appropriated by network counterculture*. This affect has long gone mainstream, though. As early as the mid-1990s, critics noted that counterculture had converged with libertarianism (as in the PFF’s manifesto) on a single understanding of the network as a space to which freedom inhered *because* of the network’s purportedly open-ended, decentralized structure.⁷⁷ It was in precisely this moment that semiconductor executive Tsugio Makimoto published the prescient *Digital Nomad* (1997).⁷⁸ While “digital nomad” has gained currency, the more uncomfortable term “digital gypsy” does not trail far behind, which *is consistent* with the intimate relationship between the network and these two figures that this genealogy of the planet-user has revealed so far.⁷⁹

But what do these two figures contribute to the planet-user? What is the relation between nomads and the Roma? For one, nomads and the Roma (“gypsies”) refer to very different people, though Roma are understood to be a type of nomad. However, the Roma have been present throughout Europe for centuries and, as “internal outsiders” of the West, have a quite different relationship to their mobility than do non-European nomads such as the Innu of Quebec and Labrador.⁸⁰ Specifically, as I will argue, “gypsies” supply the cultural affect of the planet-user while “nomads” like the Innu supply the spatial metaphor which structures the planet-user’s

⁷⁷ Barbrook and Cameron, “The Californian Ideology,” 5.

⁷⁸ Mancinelli, “Digital Nomads,” 421.

⁷⁹ While crude, simply searching “digital nomad” and “digital gypsy” in Google reveals that the two terms are in the same order of magnitude. At the time of writing, “digital nomad” yielded 64.7M results, while “digital gypsy” yielded 19.5M.

⁸⁰ Bancroft, *Roma and Gypsy-Travellers in Europe*, chap. 1.

mobility. Both figures must become residual in order for the speculative planet-user to exist, both materially and culturally.

“Gypsies” and the Cultural Affect of the Planet-User

“Gypsies” and nomads, though, do not merely have the conceptual relationship mediated by the planet-user which was just outlined. Instead, the two converge, physically—in Canada. This surprising return comes in the form of Canadian-born Roma activist Ronald Lee’s freewheeling 1971 fictionalized autobiography *Goddam Gypsy*. In it, Lee interrogates this relationship like no other text can: the protagonist, Yanko, is a Gypsy, and his wife, Marie, is Cree. Together, they get to heart of the spatial difference between nomads and “gypsies,”

First they [indigenous Canadians] had been pushed into *reservations* where there was nothing but cold, hunger, and unemployment. Then they’d come hopefully to the white man’s cities, only to be driven into the slum ghettos. The Gypsies were different. If they’d ever had a land of their own *it had been swiped so long ago that it had long since ceased to have any valid meaning.*⁸¹

as well as the difference in cultural prestige between the two:

‘Say,’ I [Yanko] told [Marie], ‘you’d do great as a fortuneteller on the reservations.’
‘No, I wouldn’t,’ [Marie] said. ‘We Indians don’t have any future.’⁸²

When the couple gets caught up in illegal activity and run out of goodwill in Montreal, they board a steamship to Europe to become expatriates:

⁸¹ Lee, *Goddam Gypsy*, 32. Emphasis mine.

⁸² Lee, 44.

I [Yanko] noticed that she [Marie] had done her hair in braids and was wearing her beaded Indian headband. Did she want to tell the people in Europe that Canada had gotten so bad, even the Indians were leaving?⁸³

Here, there is a clear sense that Roma culture is marketable, for fortune-telling might even succeed on a Cree reservation as Yanko suggests, while nomads like the Cree are only valuable insofar as they can be dispossessed of their territory. In his foreword, Lee identifies Gypsy culture especially with “the freedom of self-employment,” “a phobia about bulky possessions,” political disinterest, and “defiant joy.”⁸⁴ Meanwhile, self-proclaimed digital gypsy James Taylor identifies entrepreneurialism and “minimalism” in material goods as “trends” which are part of the appeal of this lifestyle. Redoubling this sentiment, Taylor reminds us that “being a digital gypsy is more of a frame of mind than genealogy.”⁸⁵ How deep does this sentiment go? After all, Lee stresses the primacy of cultural appropriation in a trifecta of co-constitutive forms of Roma dispossession which also includes poverty and persecution.⁸⁶

The digital gypsy’s cultural affect of self-employment, locational flexibility, and pervasive “ethos of freedom” is part of a lineage of Roma representation which has consistently associated them with worldliness, independence, improvisation.⁸⁷ Periodically, gypsies pass through the provincial town of Macondo in Gabriel Garcia Márquez’s *One Hundred Years of Solitude*, enacting well-worn tropes such as staging a carnival, snatching children, and being promiscuous.⁸⁸

⁸³ Lee, 211.

⁸⁴ Lee, ix–xi.

⁸⁵ Taylor, “Life as a Digital Gypsy.”

⁸⁶ Lee, *Goddam Gypsy*, x: “Of all the unwritten histories, that of the Gypsies is the most extraordinary. Our music, our art, our crafts, our fashions have been stolen to be presented in the concert halls and museums of the world as Spanish, Hungarian, Czechoslovakian, Russian, French, and so on. All that we have created through the centuries has been taken from us, and yet in popular myth we are the ‘thieves.’”

⁸⁷ Mancinelli, “Digital Nomads,” 426–27; Trumpener, “The Time of the Gypsies.”

⁸⁸ Trumpener, “The Time of the Gypsies,” 846; García Márquez, *One Hundred Years of Solitude*, 89–91; Ward-Jackson and Harvey, *The English Gypsy Caravan*, 25. Technically speaking, José Arcadio was not kidnapped by the gypsies, but ran away with them. According to Ward-Jackson and Harvey, Adam Smith was briefly abducted by a group of gypsies as a child.

Márquez sees “gypsy” worldliness as both positive and negative: the unbounded saturnine wisdom and breadth of experience of the crow-like Melquíades, and the unbounded hedonism, carnality, greed, and selfishness of the massive José Arcadio.⁸⁹ As two of the only characters in the novel with experience of the world beyond isolated Macondo, both have an outsized impact on the town; with this status, José Arcadio exploits the town, while Melquíades rescues it from a plague with his vaccine “of a gentle color.”⁹⁰ In either case, the “gypsy’s” flexible location endows them with an expanded, cosmopolitan culture—a global culture—which is unavailable to sedentary people, a notion resonant with the digital nomad dream of global citizenship.⁹¹

In addition to the digital gypsy’s utopian imagination of Roma cosmopolitanism as a kind of global culture, this culture is specifically identified as being improvisatory, flexible, and even playful, those “naturally entrepreneurial” qualities of gypsies.⁹² While Constant’s New Babylon located Roma improvisation in their mode of occupying space, which he extrapolated from his observations in the market hall of Alba, most outside observers have located Roma improvisation in their music.⁹³ The Western musical canon has historically associated improvisation with irrationality in contrast to the rational orchestra and its highly planned score. “Flight of fancy,” “fantasy,” “rave,” “ramble,” “to be delirious:” To hegemonic composers and critics, improvisation was pure imagination. It was, in essence, play with sound, much like the space-play of New Babylon’s *Homo ludens* inhabitants.⁹⁴

⁸⁹ García Márquez, *One Hundred Years of Solitude*, 72.

⁹⁰ García Márquez, 49.

⁹¹ Digital Nomads Nation, “Need of a Global Identity & Citizenship”; Karsten, “How To Become A Digital Nomad (And Work From Anywhere!):” Karsten espouses the benefits to one’s worldview which being a digital nomad offers (“broaden your mind through travel experiences”).

⁹² Taylor, “Life as a Digital Gypsy.”

⁹³ Nieuwenhuys, “New Babylon,” 1; Malvinni, *The Gypsy Caravan*.

⁹⁴ Malvinni, *The Gypsy Caravan*, 44; Nieuwenhuys, “New Babylon,” 2: *Homo ludens* is “playing man.”



Image 9:

The Hungarian Café of the 1893 World's Fair, which featured a “gypsy band” playing *style hongrois*, a type of Roma folk music which was popular in Budapest's cafés at the time, though it came to be known as “gypsy music” across Western Europe and North America despite its highly specific origins.⁹⁵

image from WorldFair1893.com, “Midway Plaisance”

Just as digital nomads identify locational flexibility—their ability to improvise their location—as the source of their liberation from the “the script” of the global political economy, classical composers of the nineteenth century sought to reinvigorate their scores with expressive power by writing in cadenzas to approximate improvisation within the hegemonic structure of orchestral music.⁹⁶ In this view, it becomes clear how New Babylon, insofar as it was a response

⁹⁵ Ward-Jackson and Harvey, *The English Gypsy Caravan*, 37; Malvinni, *The Gypsy Caravan*, 15.

⁹⁶ Mancinelli, “Digital Nomads,” 427; Malvinni, *The Gypsy Caravan*, ix, 49; Zdanevich, *Le Degré 41 Sinapisé (Lecture on Pearl Disease, Paris 1922)*: Georgian Futurist poet Iliazd would have characterized this desire to ‘reinvigorate’ one’s mode of expression using terms from outside its vocabulary as a response to “pearl disease.” Pearl disease is glossed as the problem of language preventing the expression of what is innate to the artist, but not able to be expressed in the mode available to them. Accordingly, reaching for improvisation is a way to respond to the pearl disease of hegemonic classical composition. In this view, the figure of the digital nomad is a response to the pearl disease of sedentary life; to express their internal desire for liberation, they feel compelled to imagine themselves as someone who they are not, i.e. a “gypsy.”

to the *unprecedented* displacement of European populations after WWII, identified the Roma as the source of a *novel* spatial solution: that of improvisation, speed, and flexibility, rather than the monolithic International Style housing projects Constant and the other Situationists saw as repressive and carceral.⁹⁷ Camps are ambiguous, though. They can be light and ephemeral, or they can be weighty sites of control and manifestations of permanent emergency—associations which should have all too salient to Constant, though they are conspicuously absent in New Babylon.⁹⁸ However, the extraction of concepts from nomads does not end with music and architecture. In fact, the very first term we came upon in this genealogy is prime among these concepts.

A Thousand Plateaus, the poststructuralist tome where “rhizome” originated, describes itself a work of “nomad thought.”⁹⁹ To its authors, “nomad thought” means they do not conceive of their text as an orthodoxy, and as such do not desire it to be read only its own terms; rather, it is an “open system” for interpretation which does “pretend to have the final word.”¹⁰⁰ As such, it is fair to wonder, especially in light of the authors’ anti-statist politics, why the text persistently cites French colonial anthropological studies of Asian and African nomads to derive their conceptual nomads the borderless “smooth space” they inhabit.¹⁰¹ The rhizome, it turns out, is the fruit of a tree—the tree that is the striated epistemology “nomad thought” desires to displace.¹⁰²

Clearly, gypsies and nomads are a site of significant speculation. For interpreters as disparate as classical composers, architects, and philosophers, but in all three cases, they served only a concept, a “timeless” spectacle of residual culture whose materiality must be displaced in order for future-oriented ideas to be extracted from them, such as New Babylon’s labyrinthine

⁹⁷ *Campo Nomadi*, 32:39; Nieuwenhuys, “New Babylon.”

⁹⁸ Hailey, *Camps*, 5–8.

⁹⁹ Deleuze and Guattari, *A Thousand Plateaus*, xiii.

¹⁰⁰ Deleuze and Guattari, x.

¹⁰¹ Deleuze and Guattari, xiii; Miller, “The Postidentitarian Predicament in the Footnotes of *A Thousand Plateaus*,” 10.

¹⁰² Deleuze and Guattari, *A Thousand Plateaus*, xii.

design or *A Thousand Plateaus*' intellectual project of the rhizome.¹⁰³ The figure of the digital gypsy, then, is merely the latest in a long lineage of abstractions of actual gypsies, though now it has been filtered through to a banal "lifestyle design" from its former position in high counterculture.¹⁰⁴

Innu and the Spatial Metaphor of the Planet-User: A Bridge to Archaeology

While it is the Roma who supply the digital gypsy with their emic cultural affect which emphasizes the pursuit of individual happiness through entrepreneurial improvisation, there has already been a slippage between this figure and that of the digital nomad. Where does this leave nomads like Quebec and Labrador's Innu in relation to the planet-user? As Yanko from *Goddam Gypsy* suggested, nomads like the Cree or Innu have *land of their own*, unlike the Roma, whose, he says, "had been swiped so long ago that it had long since ceased to have any valid meaning."¹⁰⁵ Though indigenous Canadian nomads may possess land by the standard of the Roma, settled European observers have always questioned the nature of this possession. Donald MacLeod, an anthropologist of Ottawa's National Museum of Man, was contracted in the summers of 1967–1969 by Brinco, the corporation responsible for the development of the Churchill Falls, to investigate the possibility that Innu would be displaced by the inundation necessary to create the project's reservoir. He concluded that because Innu "had to keep moving all year to wrest a living from their inhospitable surroundings," no one would lose their (permanent) home.¹⁰⁶

¹⁰³ Trumpener, "The Time of the Gypsies," 884; Williams, "Dominant, Residual and Emergent," 122; Nieuwenhuys, "New Babylon," 15–16; Deleuze and Guattari, *A Thousand Plateaus*, pt. Introduction: Rhizome.

¹⁰⁴ Taylor, "Life as a Digital Gypsy"; Barbrook and Cameron, "The Californian Ideology."

¹⁰⁵ Lee, *Goddam Gypsy*, 32; Yanko correctly diagnoses the issue of a Roma homeland. He is corroborated by the following: Bancroft, *Roma and Gypsy-Travellers in Europe*; Mirga, "Leadership, Representation and the Status of the Roma"; Ward-Jackson and Harvey, *The English Gypsy Caravan*.

¹⁰⁶ Smith, *Brinco: The Story of Churchill Falls*, 351.

From the perspective of power, mobility is liberating for the Roma, but oppressive for the nomad: to survive, the Innu *had to* move. Yet, for the Innu, the ability to make epic journeys around the rough terrain of Labrador and Quebec was historically a source of prestige, and today annual hunting treks are an important way Innu have maintained cultural continuity despite their displacement from Central Labrador.¹⁰⁷



Image 10:
Mikuan's father boards the QNSL north from Sept-Îles
Kuessipan (2019), 33:00.

In *Kuessipan*, the father of the protagonist, Mikuan, boards the Labrador-bound train from the port of Sept-Îles, Quebec. Each year, he travels north to hunt in the areas west of the Smallwood Reservoir, using the Quebec North Shore-Labrador railroad which was built to export iron ore to the coast, as well as hauling cargo for the construction of Churchill Falls during the 1960s.¹⁰⁸

¹⁰⁷ Loring et al., "The Archaeology and Ethnohistory of a Drowned Land," 46–47; *Kuessipan*, 32:06-33:00.

¹⁰⁸ Smith, *Brinco: The Story of Churchill Falls*, 343–44.



Image 11:
Francis takes Mikuan to listen to the powerlines outside Sept-Îles
Kuessipan (2019), 44:46.

Later, Mikuan and her admirer Francis drive out to the edge of Sept-Îles where they stand below the enormous powerlines, hearing the crackling sound of hundreds of thousands of kilovolts coursing overhead: “All that noise from something you cannot see,” he says.¹⁰⁹ As they stare down interminable clear-cut corridor for the transmission lines, there is the following exchange:

Francis: Did you ever learn why you all ended up on reserves? After owning all this land?

Mikuan: Yeah, sure. Didn't you guys?

Francis: No, just that I could buy you for a musket and two mirrors

Mikuan chuckles.

Mikuan: Cheapskate.

Francis: Why? Mirrors were expensive.

¹⁰⁹ *Kuessipan*, 44:46.



Image 12:
Clear-cut forest outside Sept-Îles as right-of-way for powerlines.
Kuessipan (2019), 45:05.

For the digital nomad, constant travel endows them with a global territory, just as the Innu’s mobility endowed them with the great expanse of Labrador.¹¹⁰ Though this mobility was largely an adaptation to the region’s seasonally shifting resources, the tradition of making long journeys for prestige demonstrates that environmental conditions did not *dictate* Innu movements.¹¹¹ But digital nomad mobility, which has no relationship to the shifting environment, requires the expropriation of actual nomadic lands in order to extract the energy which will increasingly undergird their existence.¹¹² Coincidentally, this kind of “double dispossession” of the actual nomad by the digital nomad has been noted in the displacement of Roma from their traditional neighborhoods in Cluj, Romania because of an influx of remote workers (“digital gypsies”) and their Airbnbs.¹¹³

¹¹⁰ Bryant, “A Journey to the Grand Falls of Labrador,” 15. Even the low estimation explorer Henry Bryant placed on Innu navigational abilities reveals that he understood them to occupy an extensive space, if only in statistical terms: “A vast extent of territory is covered by these natives in their wanderings.”

¹¹¹ Loring et al., “The Archaeology and Ethnohistory of a Drowned Land,” 46–47. Ironically, the ability to move far and fast is a shared sign of prestige for both digital nomads and the Innu, though obviously in radically different contexts.

¹¹² Mancinelli, “Digital Nomads,” 421.

¹¹³ McElroy, “Digital Nomads in Siliconising Cluj: Material and Allegorical Double Dispossession.”

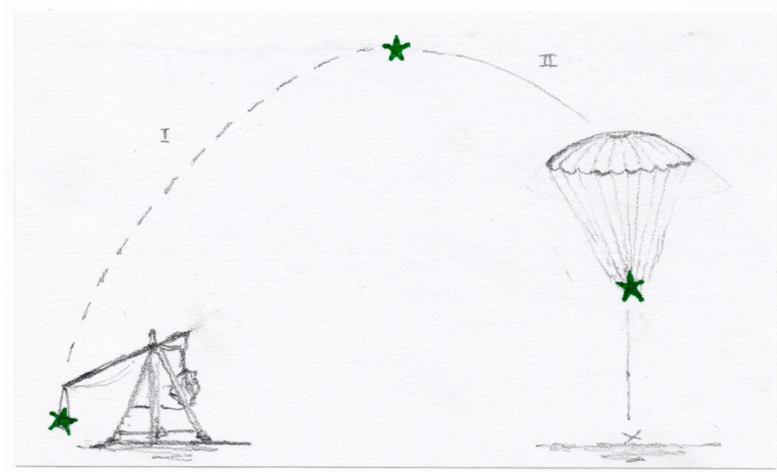
In the course of this genealogy, we have seen just how deep, diverse, and difficult the ideological underpinnings of the planet-user go. From avant-garde architecture to classical music, poststructuralist theory to wishy-washing “sensory spaces,” the nomad looms large in the cultural affect of the planet-user, who is not merely in vogue as one of Nærbø’s “global megatrends,” but the latest culmination of an extensive network of cultural production and misinterpretation.¹¹⁴

More data, faster than ever. How might we come down from the vertiginous pace of acceleration without crashing to a smoldering halt? Is the only way down *through*?¹¹⁵

¹¹⁴ *Creating Sustainable Solutions*, 0:26.

¹¹⁵ Shaviro, *No Speed Limit*, chap. 1, para. 2. This book reviews the controversial philosophy of accelerationism, which posits that “by exacerbating our current conditions of existence, we will finally be able to make them explode, and thereby move beyond them.”

POINT OF INFLECTION



I hope not. Here, at the top of this project's arc, acceleration becomes deceleration. If a genealogy of the planet-user has led to Labrador, archaeology is what will bring me to its heart. This journey comes as four "strata," a term borrowed from geology, which I have taken to mean a step in the process of decelerating. In the uppermost stratum, at the surface, change comes fast, but in each stratum below it, this evolution happens progressively slower. Likewise, each successive segment of the following archaeology is attuned to a slower infrastructure of the planet-user. The itinerary? In order: advertisement, surveying, construction, and then geology.

DECELERATION: An Archaeology of the Planet-User

Stratum 4

“Clean, Green, Sustainable”: Promoting Infrastructure as Investment

scale: photon, 10^{-54} kg, 50,000,000 pulses per second at 70% of lightspeed

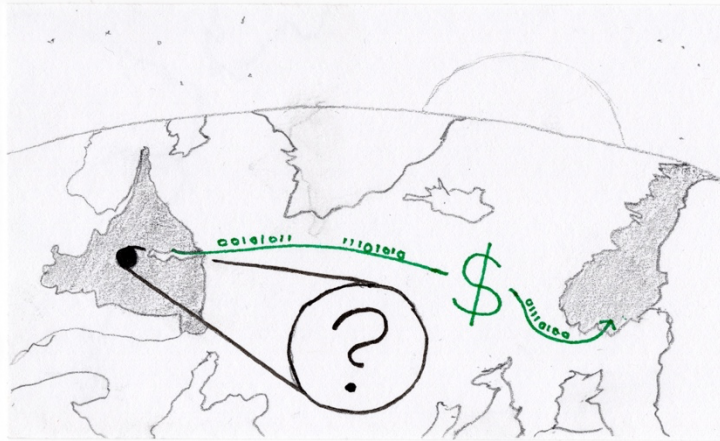


Image 13:
from *Leif Erikson cable system*, 0:43.

A man in a baseball cap, dark jeans, and a zipped-up black coat stands on a starkly monochrome rock jetty.¹¹⁶ Low, wind-whipped waves race toward the stones and crash

¹¹⁶ *Leif Erikson Cable System*, 0:43.

ineffectually, casting a bit of spray up, some droplets dampening his back. The sea's chop has been muted by the editor, leaving the man's voice clear but strained, asserting itself over the cold air which buffets his sturdy frame. What he says about the bay around him does not matter, really. For him, it is enough to simply *be* here: the grey sky, the wind's howl, and the barren outcropping are practically shorthand for remoteness. What brings a man to a place of such desolation?

In another shot, the water is still.¹¹⁷ From our oblique position, the bay reflects the sky, but the water may as well be transparent, immaterial, no longer the dividing line between two worlds. Its clarity affirms that submarine and terrestrial barely differ; water is but a tattered membrane draped over the rocky surface beneath it.

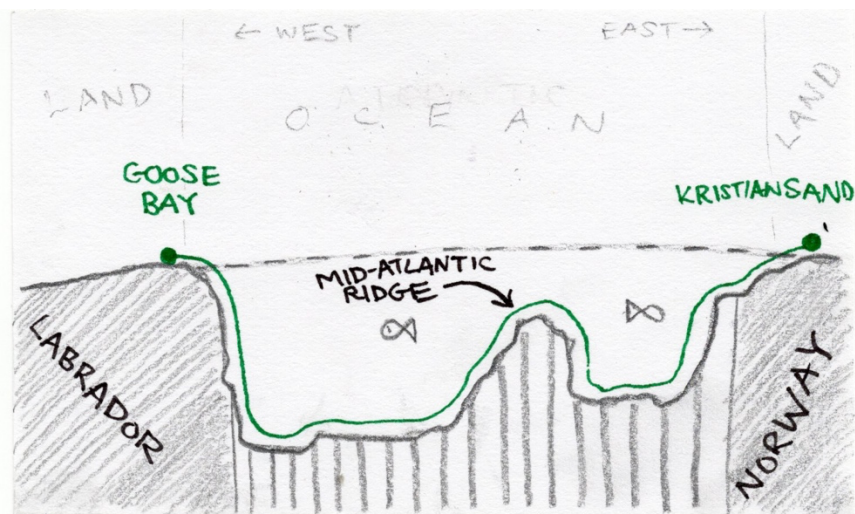


Figure 7:
The Atlantic Ocean.

The man is out of frame now, and instead a pair of rubber boats tend to a long line of floating orange spheres (Image 14, next page). In the distance, a blurred figure looms, placid and mechanical. Its distant shape is studded with protrusions, perhaps sophisticated equipment for a

¹¹⁷ *Leif Erikson Cable System*, 0:45.

specialized task. Might the two boats near us be crewed by sea farmers tending a plot of marine cabbage? Perhaps it is their titanic harvester blurred in the distance far behind them.



Image 14
from *Leif Erikson cable system*, 0:45.

We've met this man already. He is not a sea farmer, nor fisherman, nor adventurer, but Peder Nærbø. He stands on a rocky outcropping in Sheshatshiu, an Innu settlement on the shore of Lake Melville, the estuary where the Churchill River empties into the North Atlantic.¹¹⁸ It is precisely here, we are told, that the Leif Erikson Cable makes its landing after a long journey across the ocean floor. Although this part of Canada is, as the tern flies, the closest part of North America to Europe, the Leif Erikson is the only one planned to operate on this route in the near future, though the first two transatlantic cables (1858 and 1866) also departed from this region.¹¹⁹ However, technology quickly improved and costs decreased, and the longer routes to the U.S.'s densely-populated Mid-Atlantic region became the standard way cables traverse the Atlantic.

¹¹⁸ *Leif Erikson Cable System*, 0:41.

¹¹⁹ Rowe, *Connecting the Continents*. These cables landed at Come-By-Chance, Newfoundland, not in Labrador. But nonetheless, the same province and a very similar route.

Today, almost nothing has changed. The cautious cable industry tends to use routes whose safety has already been proven, a kind of path dependence which Nicole Starosielski studies in relation to the imperial geographies these cables continue to trace across the Pacific Ocean.¹²⁰ Though the Leif Erikson takes the same route as the first transatlantic cables, its path is not determined by distance like its low-tech precursors, but the promise of abundant renewable energy and a cool climate at both of its points of landing—“the beauty of the cold north,” as Nærbø puts it.¹²¹

This is the first installment of “Behind the Scene,” a twelve-part series of unusual promotional films released by Bulk Infrastructure in July of 2022 to the company’s YouTube page. The series is half travelogue, half investor pitch. Each installment is under ninety seconds, and each concludes with Peder Nærbø enthusiastically delivering the project’s tagline: “Clean, Green, Sustainable.”¹²² As the series’ title suggests, the videos visit the actual sites of energy production and use that appear as abstract dots and lines on Bulk Infrastructure’s diagram of the project. However earnest this effort is, the series merely provides the appearance of grounding the operation of the cable and the electrical grid. By idiosyncratically intercutting stock and actual footage as well as curating infrastructure imagery, the “Behind the Scene” promotional series reveals itself to be just another abstraction of the Leif Erikson Cable’s materiality, although it masquerades as an authentic account of the infrastructural conditions of Quebec and Labrador on which the project is premised.

¹²⁰ TeleGeography, “Submarine Cable Map”; Starosielski, *The Undersea Network*, chap. 1.

¹²¹ *Leif Erikson Cable System*, 0:29.

¹²² *Leif Erikson Cable System; Creating Sustainable Solutions; The Renewable Giants; Traditional Infrastructure Powering Our Future Generations; Millions of Creeks; Scalability of Hydropower; Transmitting Energy with Minimum Loss; Final Harvest; Into the River; No More Clouds; Hundred Years; Preparing for the Future.*

One frame before the image which introduced this project (Image 1),



was this one:



Image 15:
Adjacent frames from *The renewable giants*, 1:03

An instantaneous jump from floating streams of cyan numbers to a gloomy city street, this juxtaposition of stock footage with real life is especially obvious.¹²³ Like any typical business promotion, the “Behind The Scene” series intercuts this kind of imagery to illustrate and emphasize its message. However, unlike the almost comic visual cliché used to represent data processing in this intercut, another such moment uses the same technique to insidious effect.

¹²³ *The Renewable Giants*, 1:03.



Image 16:
Nærbø introduces the two “global megatrends”
from *Creating sustainable solutions*, 0:23.

When Nærbø introduced the two “global megatrends” of climate change and digitalization, he stood in company-branded high-visibility jacket in front of a Quebec City data center. To illustrate his point, drone footage of a charred forest appears on screen; a violent image to illustrate the urgency of Bulk Infrastructure’s corporate mission. The forest, however, is no casualty of climate change: it was scorched by the pyroclastic flow of ash from the eruption of the volcano in the background of the clip (see Image 15 below).¹²⁴ So, to Bulk Infrastructure, climate change seems less to be a specific material phenomenon, and more a metonym for environmental destruction of any kind. It is precisely the perception that the Leif Erikson Cable can “address” this destruction which sells the project. For Bulk Infrastructure, climate change, insofar as it is a causeless “trend” which bears on market dynamics, is an opportunity.¹²⁵ What appears on screen to be an earnest concern for environmental destruction turns out to be a moment of capitalist

¹²⁴ I could never have discovered this without Google’s machine learning algorithm, which identified the image I saw on screen as the forest adjacent to Tolbachik volcano in Kamchatka, Russia. I verified this conclusion by comparing Bulk Infrastructure’s stock footage with other images of the forest in Kamchatka.

¹²⁵ *Creating Sustainable Solutions*, 0:30.

“creative destruction:” the opening of the ‘green’ frontier, ripe for new investments and new chances to extract value from the Earth and its population.¹²⁶



Image 17:
Bulk Infrastructure’s stock footage of the burned forest beside Tolbachik.
from *Creating sustainable solutions*, 0:30.

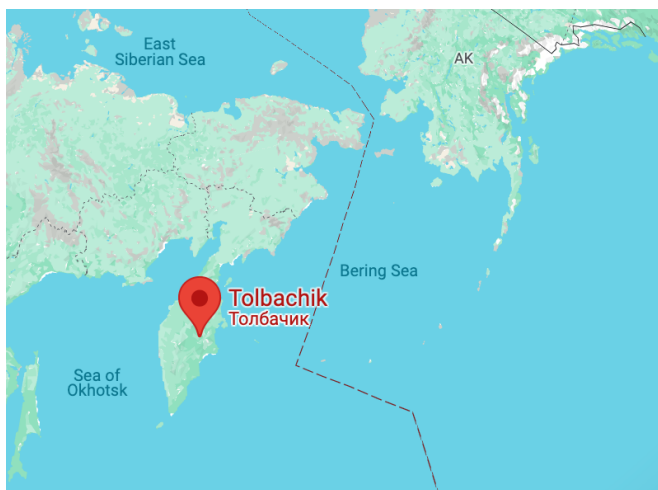


Figure 8:
Location of Tolbachik in Kamchatka, Russia.
Google Maps

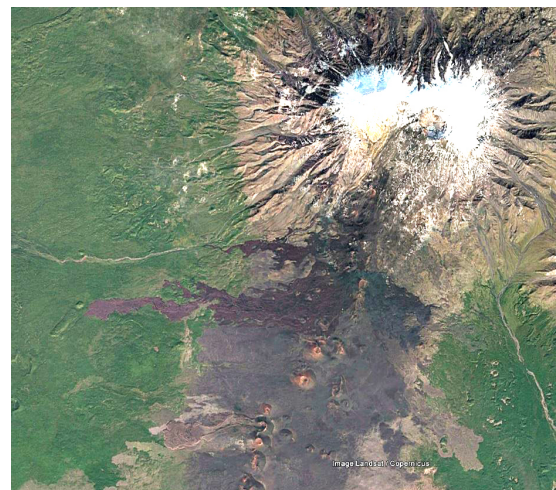


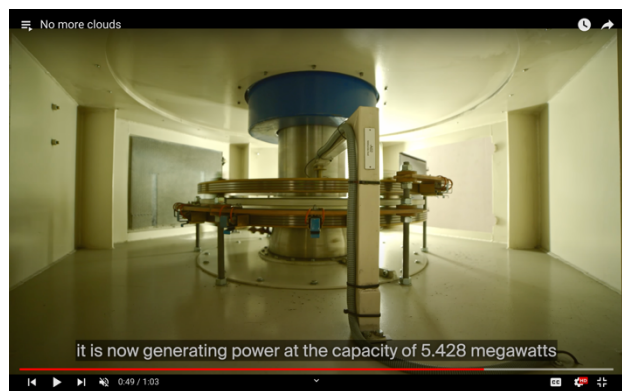
Image 18:
The burned forest (brown) from above.
Smithsonian Global Volcanism Program

¹²⁶ Harvey, “Neoliberalism as Creative Destruction,” 34.

In addition to this particularly egregious example of Bulk's use of overgeneralized imagery in its promotional series, there is also a more subtle slippage in the documentary travelogue that the videos purport to provide. The eleventh installment, *Hundred years*, takes Nærbø to the construction site of Muskrat Falls Generating Station, which lies about 170 miles downstream of Churchill Falls, much nearer to Lake Melville and the coastal settlements of Happy Valley-Goose Bay and Sheshatshiu. In his Bulk Infrastructure high-visibility jacket and Nalcor power utility hard hat, he describes the enormous Kaplan turbines which generate power here, which is illustrated by a clip of a metal rotor spinning inside of a stark white room, presumably within the concrete structure he stands talking in front of.¹²⁷ However, a clip of the same device appeared three installments earlier as a visual for his description of Churchill Falls Generating Station's 5,428 megawatt capacity, which are generated with Francis turbines.¹²⁸



Hundred years, 0:11



No more clouds, 0:49

Image 19:

Reused shot location used to represent different Churchill Falls and Muskrat Falls powerhouses.

In this slippage, the ground truth of the entire series comes into question: either the interiors of the two generating stations look identical, or Bulk simply took two shots of the same room at only one of the generators because *it does not matter what the infrastructure really looks like*. Even

¹²⁷ *Hundred Years*, 0:11.

¹²⁸ *No More Clouds*, 0:49.

couched in the series' documentary style, infrastructure is revealed to have no real interior, just the idea of an internal mechanism. Each power installation is but a dot in a diagram, a *node* in a network, a point with no dimensionality. Yet, as we will see in Nærbø's visit to a reservoir, these installations are also *landscapes* which are entirely dimensional, literally defined by their volume. The capacity of Churchill Fall's reservoir, the Smallwood-Ossokmaunan, is approximately 7.83 cubic miles—more than eight trillion gallons.¹²⁹

A true behind-the-scenes travelogue would not work as a promotion because it would be too mundane, too complex, and too specific. Promotion is a kind of speculation: both entail taking a risk today in order to gain in the future—producing “Behind the Scene” cost something, but may well help Bulk Infrastructure capitalize on greenness in a computing market which is increasingly concerned about its energy supply.¹³⁰ The relation between promotion and speculation deepens: while promotion connotes moving forward toward the future, ‘speculation’ has its roots looking from the watchtower, of seeing from afar.¹³¹ Promoting infrastructure, then, means selling its big picture—for Bulk, a greener, more connected, and better informed world—not its minutiae.

Though depicting two different types of turbines with the same clip suggests that Bulk Infrastructure's advertising department is inattentive to the imagery they choose to show, three earlier installments demonstrate that they *do* have command over how they represent energy infrastructure. First, Bulk Infrastructure portrays Quebec's Manicouagan hydroelectric scheme as a beautiful, low-impact realization of natural potential. After that, Bulk uses camerawork and sound design to encode apology (and apologia) into the aesthetic of their banal acknowledgement of hydroelectricity's environmental damages.

¹²⁹ About thirteen million Olympic swimming pools, to use the typical standard of volume comparison.

¹³⁰ Yang and Chien, “Large-Scale and Extreme-Scale Computing with Stranded Green Power.”

¹³¹ From the Latin: *speculari* (v.), from *specula* (n.) “watchtower,” from *specere* “to look” (v.).

But before they engage critically with the environment, Bulk delivers the sheer spectacle of monumental infrastructure. Great grey arches stretch to the sky, their edges darkened by irregular streaks of rain. They dwarf Nærbø, who, in this low-angle shot, traces their graceful forms with his arms, evidently awed by Manic-5, the largest arch-and-buttress dam on Earth.¹³²



Image 20:
Nærbø stands beneath one of Manic-5's thirteen arches.
from *Scalability of hydropower*, 0:30.



Image 21:
Nærbø at the shore of the Manicouagan Reservoir.
from *Millions of creeks*, 0:32.

¹³² *Scalability of Hydropower*, 0:30.

Later, as he emphasizes hydropower's cleanliness, we see the dam from the impounded side: placid water sits against a perfectly straight smooth wall, nestled in misty forested hills.¹³³ Not a man or road is in sight. The following installment finds Nærbo emphasizing the uniquely low-evaporation landscape of Laurentian Canada, delivering this account while standing on a sandy, pebbled beach which is ostensibly the shore of the Manicouagan Reservoir.¹³⁴ Low ripples approach the shore, distant black spruce jostle in the breeze, and the great buttresses are nowhere to be seen. This might as well be a natural lake. While his words declaim that this place is related to electricity and in turn data processing, this place clearly appears to be a planetary landscape, not a node in the global network.



Image 22:
Manicouagan Reservoir.
from *Millions of creeks*, 0:32.

Oddly, Nærbo, who has by now reminded his audience seven times that the Leif Erikson project is clean, green, and sustainable, stands immediately in front of the empty riverbed of the

¹³³ *Scalability of Hydropower*, 1:10.

¹³⁴ *Millions of Creeks*, 0:34. Nærbo's location was inferred from his location in the previous and subsequent installments of the series. Before this video, he was at Manic-2, a generating station downstream on the Outardes River in Quebec, and in the next installation, he is at Manic-5, which is further upstream on the same river. Accordingly, it stands to reason that in this installment, he was between the two locations alongside the impounded river which serves as Manic-2's reservoir.

Churchill River.¹³⁵ Bulk shows us, plainly, and expresses through Nærbø's speech, exactly what happened to the waterfall in order to create the generating station which undergirds their project's cleanliness, greenness, and sustainability. The camera cuts to a silent, slowed-down handheld shot which moves around Nærbø as he stands, visibly chilled, with a red nose and slight grimace.



Image 23:
Nærbø stands silently while his voice-over narrates
Bulk Infrastructure's defense of the Churchill Falls project.
from *No more clouds*, 0:33.

He appears to be reflecting, reminding us that he is not merely an excitable energy tourist, but a thoughtful interpreter of the history his company has inherited. In a voice-over, Nærbø tells us that “[t]hese are the things we need to do *locally* as we develop renewable energy in the future.”¹³⁶ Though the voice is Nærbø's, his lips do not move on screen, and this non-diegetic break makes it feel as though we are inside of his head—inside of Bulk Infrastructure's head. What we see is a carefully coded statement of acknowledgement, though the acknowledgement itself is profoundly banal in light of the violent image of the empty riverbed which the promotion provides. To avoid the *global* environmental destruction Bulk warned of with the image of the burned-out

¹³⁵ *No More Clouds*, 0:30.

¹³⁶ *No More Clouds*, 0:38. Emphasis mine.

Russian forest, particular *local* environments must be sacrificed, they seem to say. Here, Bulk Infrastructure's effort to be faithful to infrastructural realities almost goes too far. Until this installment, the promotions functioned as corporate speculative fiction about the "cold north" as an energy utopia, perfectly sited to capitalize on infrastructural adaptation to climate change in the form of data centers.¹³⁷ Though the tone of *No more clouds* is apologetic, it is really an apologia for the violence which undergirds this utopia—the ends justify the means, Nærbø might say.¹³⁸ However, the bluntness of this defense is easy to miss. Bulk Infrastructure has submerged it in an ocean of rhetoric which repeatedly underlines that the outcome of the Leif Erikson Cable project is clean, green, and sustainable. How could the means of achieving this be so different?

But Labrador did not always have the extensive energy infrastructure which appears in Nærbø's promotion. Between here to the next stratum is a jump in scale: from Bulk Infrastructure's view of Labrador as a node in the global network to the perspective of surveyors, for whom the province was a vast landscape of unknowns. Gigahertz data transmission is replaced by the hum of a seaplane, cruising at 150 miles per hour over a blanket of black spruce, never before placed upon a grid.

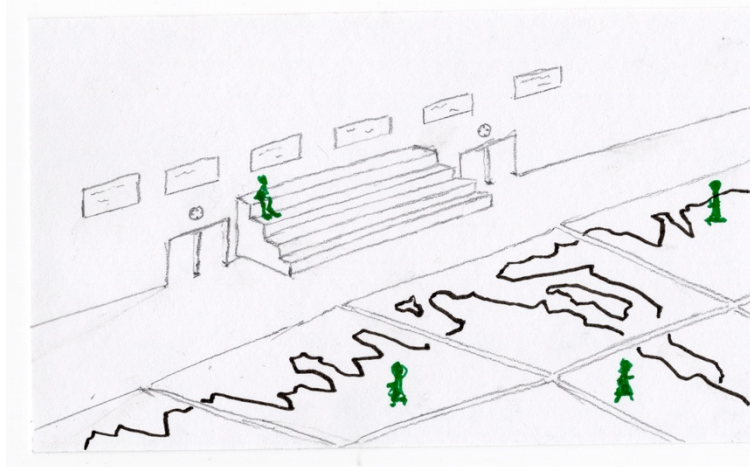
¹³⁷ *Leif Erikson Cable System*, 0:29.

¹³⁸ *No More Clouds*, 0:47: "Although the local environmental impact rerouting this river has made, it is now generating power at 5,428 megawatts."

Stratum 3

Surveying Labrador: A Complete View?

scale: 5,100 lb. De Havilland Beaver, top speed 150 mph; 1:50,000 topographic map



Tapped in 1953 to head the land surveying and mineral exploration arm of Brinco, the British Newfoundland Corporation, geologist Paul Beavan quickly engaged the corporation in a three-year, more than \$400,000 contract with Ottawa-based Laurentian Air Services, for the hire of two rugged De Havilland Beaver planes equipped with skis, pontoons, and aerial cameras.¹³⁹ Parties of trappers, amateur explorers, and even one determined widow had made forays into west-central Labrador, but none had produced information about the area sufficient for the accountants and engineers beginning to develop the Churchill Falls Generating Station.¹⁴⁰ These men needed hard figures, not the reverent naturalism of 1891 explorer Henry Bryant, who saw the falls' Innu name *Patshishetshuanau* (“Where Current Makes Clouds of Vapor”) as having a poetic quality

¹³⁹ Brinco (The British Newfoundland Corporation) was the contractor for the development of Churchill Falls, as well as mining projects in the province; \$400,000 CAD in 1953 is roughly \$3.6M in 2023 U.S. dollars; Smith, *Brinco: The Story of Churchill Falls*, 29; Metcalfe-Chenail, *For the Love of Flying*.

¹⁴⁰ Mina Hubbard's husband, Leonidas Hubbard, had perished from exhaustion during a poorly executed expedition to Churchill Falls in 1903. She completed his trek in 1905; Smith, *Brinco: The Story of Churchill Falls*, 45–46.

which would be “hard to improve.”¹⁴¹ But perhaps Bryant would have preferred the sky-high freedom of a Beaver to the confines of his unwieldy 18-foot riverboat to observe the otherworldly falls.¹⁴² These ‘bush’ planes, capable of short-length takeoff and landing, are the romantic vehicles of Canada’s northern frontier, delivering hearty woodsmen to pristine untracked environments of game, timber, water, and ice.¹⁴³



Image 24:
A De Havilland Beaver in its natural habitat.
from Flickr user Bill Murphy’s image *EPA CF-CDU Beaver 1950’s*.

But with their stabilized cameras trained on the forested nadir below them, the relationship between Brinco’s pilots and the air was not nearly so idyllic: agents of the survey, they were like human satellites, following methodical flight paths with minimum organic deviation. These surveyors and their equipment were the first step in Premier Joey Smallwood’s plan to industrialize Newfoundland and Labrador.¹⁴⁴ Though Bryant, and before him, John McLean (1839) as well as Bowdoin College graduates Austin Cary and Dennis Cole (1891), also sought to know Labrador

¹⁴¹ Innu First Nation, “Pepamuteiati Nitassinat,” 2008; Bryant, “A Journey to the Grand Falls of Labrador,” 38.

¹⁴² Bryant, “A Journey to the Grand Falls of Labrador,” 19.

¹⁴³ Dick and Patterson, *50 Aircraft That Changed the World*, 130; Murphy, *EPA CF-CDU Beaver 1950’s*.

¹⁴⁴ Hiller and Martin, “Develop or Perish: Smallwood’s Development Approach.”

by means of exploring, their interest lay in its isolation, natural beauty, and potential for adventure.¹⁴⁵ Rather than muscle a 500-lb boat up the river's edge alongside a waterfall and spot *Zapus hudsonius* jumping mice in the adjacent forest floor as Bryant did, Brinco's pilots flew to serve their camera's focal length, fixed at 5.2, 6, 8.25, or 12 inches, the standard for assembling aerial mosaics.¹⁴⁶ Though charting a yet-unmapped region, the Beavers flew their routes as if for the thousandth time: on a grid of tightly delimited points such that their exposures would overlap by at least 25% for the sake of the composite.¹⁴⁷

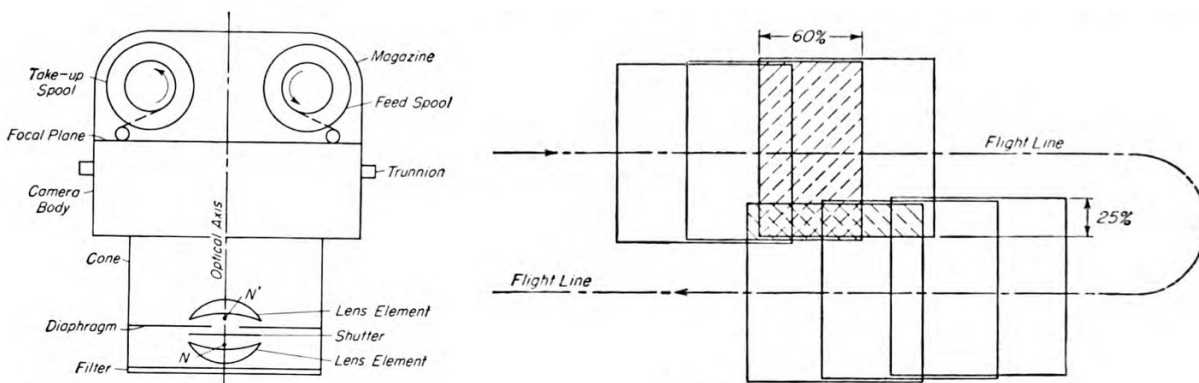


Figure 9:
Diagram of aerial camera (left) and ideal overlap of photographed areas (right).
from *Photogrammetry*, 427, 436.

According to a 1959 land surveying textbook, “[b]ecause of the wealth of detail which can be seen in a spatial model, the resultant photogrammetric map will be *more complete* than will a comparable map produced by ground methods.”¹⁴⁸ In order to build the generating station, and thereby finish the work which nature had begun, to *complete* Labrador, the region had to first become *known*—as series of 9” square negatives in a canister, buzzing over the province’s leafless

¹⁴⁵ Smith, *Brinco: The Story of Churchill Falls*, 45–46.

¹⁴⁶ Bryant, “A Journey to the Grand Falls of Labrador,” 19; Bouchard and Moffitt, “Photogrammetry,” 427.

¹⁴⁷ Bouchard and Moffitt, “Photogrammetry,” 436.

¹⁴⁸ Bouchard and Moffitt, 455. Emphasis mine.

early spring terrain at 150 miles per hour.¹⁴⁹ More than twenty years later, after Premier Smallwood’s eponymous reservoir had filled, and stands of forest had drowned at its banks, another kind of surveying project took shape. The 1980 LAMAP (“Labrador Mapping Project”) project was an effort to know Labrador as it had been known for generations before Brinco’s Beavers hopped around the region, snapping photographic tiles from high above.

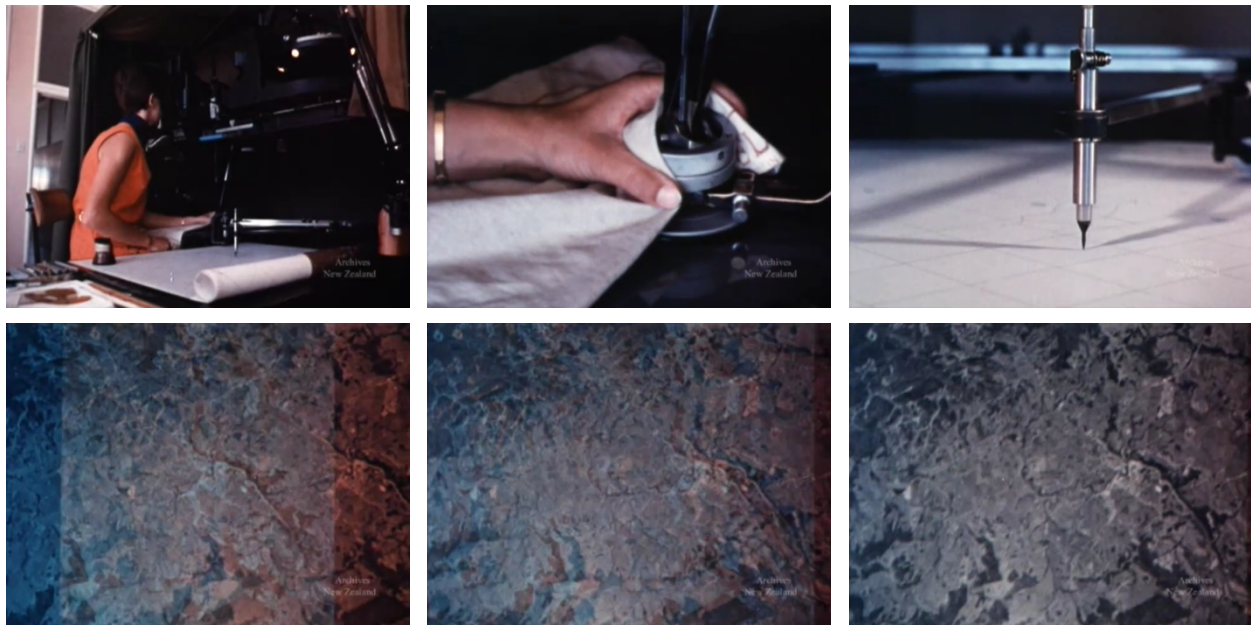


Image 25:

The process of creating a topographic map from stereoscopic tiles captured by survey aircraft. The scope operator views the three-dimensional image through specialized lenses, and traces over it with a handheld device linked to a pen which marks the map to scale on a separate piece of paper.

from *An Inch to A Mile* (1971), New Zealand National Archives, National Film Unit

On the floor of a school gym in Utshimassit/Davis Inlet, an Innu settlement along Labrador’s fjorded east coast, enormous maps of the province served as a carpet. Presumably,

¹⁴⁹ Smith, *Brinco: The Story of Churchill Falls*, vi: paraphrasing “By shaping the native rock and the debris left by retreating glaciers into a mere forty miles of strategically placed dykes, he has finished an engineering feat fortuitously begun by nature and created the third-largest reservoir in the world.”; Bouchard and Moffitt, “Photogrammetry,” 451: Early spring is the best time of year to take aerial photographs for measuring topography, since there is little snow and still few leaves on the trees to obstruct the ground.

shoes were removed in advance of stepping on the large, delicate sheets at 1:50,000 scale—approximately 16 by 20-meter rectangles. Invited to the event were old men of the settlement, many of whom had moved there as they had aged, and could no longer hunt in the forests as they once had.¹⁵⁰ From the aerial perspective of the large sheets, these men were able to recall something grounded: they annotated the maps with places they used to visit, what they did there, and what those places were called. Far from the abstract blur of the forest's canopy below a puddle-jumper's window, these men, hunters, fishermen, gatherers, saw this land as abounding in detail. Which brook had trout in it? Which pond hosted ducks? Where do the spirits dwell? Which places were old, and which were new? The men disagreed on much of this, and the resulting admixture of memories traced out on the blank sheets were a reminder that this land is rich with interpretation, irreducible to the single “objective” bird’s-eye view of Canada’s National Topographic Survey (NTS) map series which LAMAP’s leaders used to prompt the participants’ memories.¹⁵¹

Instead, LAMAP’s inconsistencies bear witness to the shifting landscape and its persistent inhabitation; alongside the caribou, fish, and plants which sustained them before they were gradually coerced into settlements in the 1950s, Innu people came and went across Labrador.¹⁵² Although European observers perceived the Innu as leaving no traces on their territory, the difficulty in reconciling the toponyms collected by LAMAP reveals that Labrador is a highly interpreted cultural landscape, marked and marked again in a great palimpsest of names.

In 1994 and then again in 2004, LAMAP was updated with more toponyms and a protracted effort to reconcile the inconsistencies of the first iteration of the project in 1980.¹⁵³ Although the

¹⁵⁰ Innu First Nation, “Pepamuteiati Nitassinat.”

¹⁵¹ “About The Maps.”

¹⁵² Penashue and Yeoman, *Nitinikiau Innusi*, xviii.

¹⁵³ Armitage, “The Labrador Toponymy Project and Its Relevance to Archaeologists,” 48. The 1994 phase (“INNUTOP”) was conducted by Montreal linguists José Mailhot and Anne-Marie Baraby, while the 2004 phase (“LABTOP”) was conducted by anthropologist Peter Armitage as well as linguists Mailhot (again) and Marguerite MacKenzie (Memorial University of Newfoundland, St. John’s).

additional data has enriched the depth of Innu occupation of coastal areas and along the Churchill River, these phases have not necessarily provided a more complete account of Labrador as an Innu cultural landscape. Furthermore, these biases are easily glossed over when the toponymy information is displayed on an ‘objective,’ interactive online map such the Innu First Nation’s website.¹⁵⁴ Specifically, the 1994 phase was conducted at Sheshatshiu, the Innu settlement near Goose Bay where the Leif Erikson cable is slated to land, and accordingly increased the density of information available in that coastal region of Labrador.¹⁵⁵ Another kind of bias was introduced in the 2004 phase: due to a lack of resources, the researchers were only able to inquire about toponyms in the East-Central portion of Labrador, which excluded about half of the province’s area, especially along the border with Quebec, where there is ample evidence which supports Innu occupation—an accordingly, countless missing toponyms.¹⁵⁶

¹⁵⁴ Innu First Nation, “Pepamuteiati Nitassinat.”

¹⁵⁵ Armitage, “The Labrador Toponymy Project and Its Relevance to Archaeologists,” 48; *Leif Erikson Cable System*.

¹⁵⁶ Innu First Nation, “Pepamuteiati Nitassinat,” sec. Introduction, para. 13; Loring et al., “The Archaeology and Ethnohistory of a Drowned Land,” 48–52.

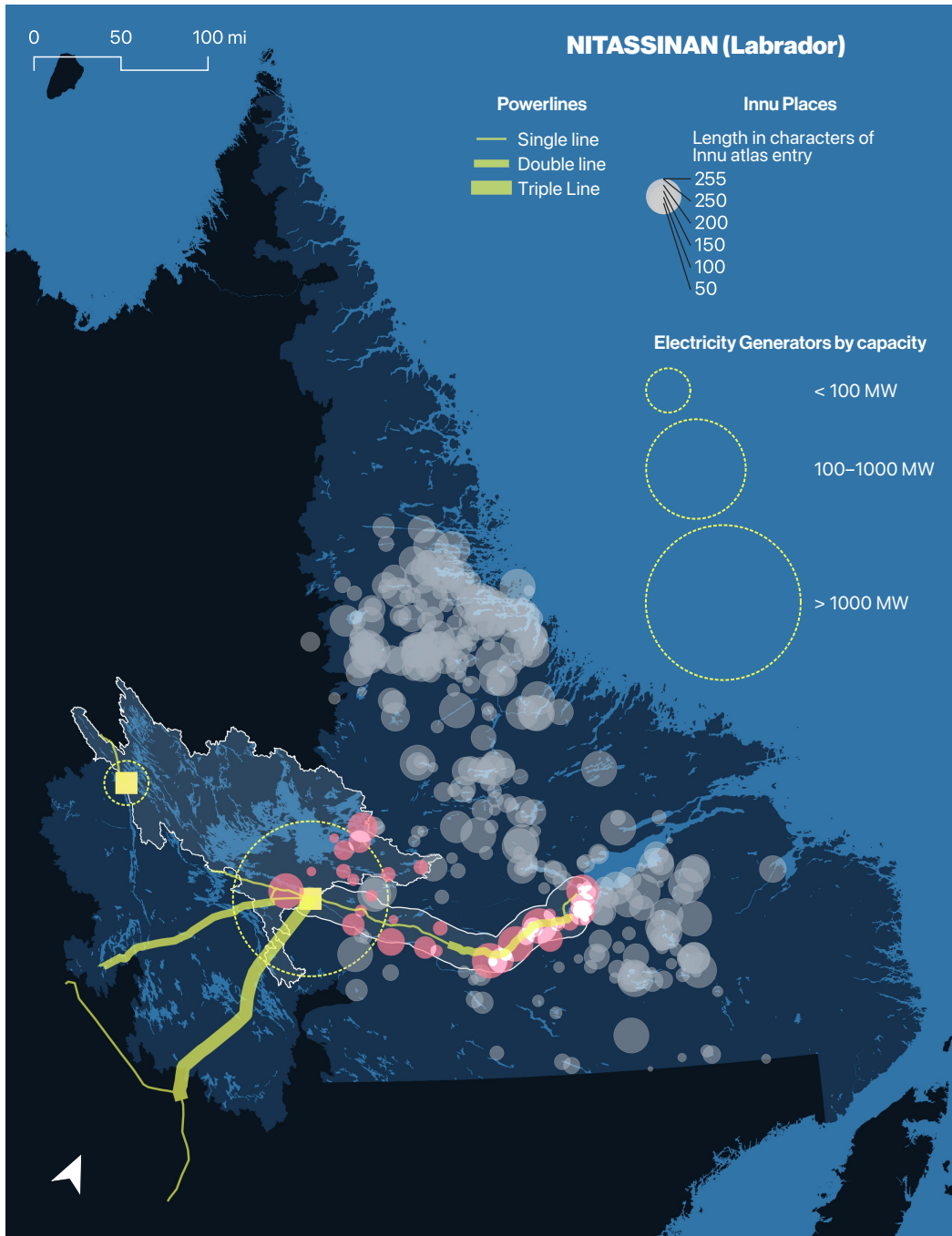


Figure 10:

A map of Innu toponyms scraped from the Innu Nation’s online “Pepamuteiati Nitassinat” index. The size of each dot crudely depicts the amount of information captured by the toponymy projects, using the length of each place’s entry as a proxy for the detail collected about it. Pink indicates that a place is within Labrador’s landscape of energy extraction, which I have suggested to be Smallwood Reservoir’s watershed and the land within ten miles of the powerlines which connect Churchill Falls to Goose Bay. Areas of Western Labrador inundated for the reservoir conspicuously lack Innu toponyms, according to the compiled atlas.

Although toponyms challenge the globe-like, extraction-oriented view constructed by Brinco's aerial surveys, the project ultimately has crucial biases toward the coast and the Churchill River. Because the source of the information was from Innu who had settled in these locations, the recorded "authentic" Innu toponymy cannot be truly separated from the extraction which led to the displacement in the first place. As such, it remains of utmost importance to continue to counter-interrogate the space of Labrador through Innu oral histories and the grounded explorer narratives of the early 20th century in order to see the province as a planetary, human landscape, rather than the vacant, global node of energy and mineral production as Brinco saw it.¹⁵⁷



Image 26:
A surveyor assembles a mosaic.
From *Photogrammetry*, 439.

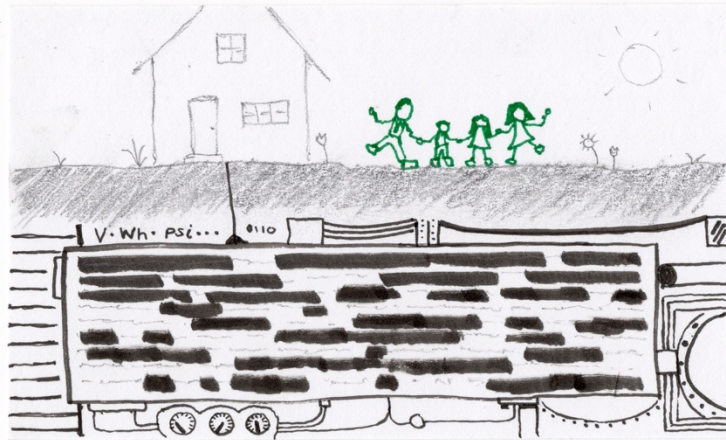
¹⁵⁷ Spivak, "Planetarity," 72.

Now, a jump down in speed and in scale. The summer's team of surveyors zipping overhead will be replaced by legions of all-weather laborers, who will hew immense caverns from granite bedrock, working continuously for more than four years to convert Churchill Falls into a permanent source of energy. Above them, a small town and its first generation will spring from the lakeside's rocky podzol soil.

Stratum 2

The Great Indoors: Churchill Falls and Subliminal Infrastructure

scale: 6,300 workers; 1,800,000 m³ of granite excavated; 53 months until first power generated



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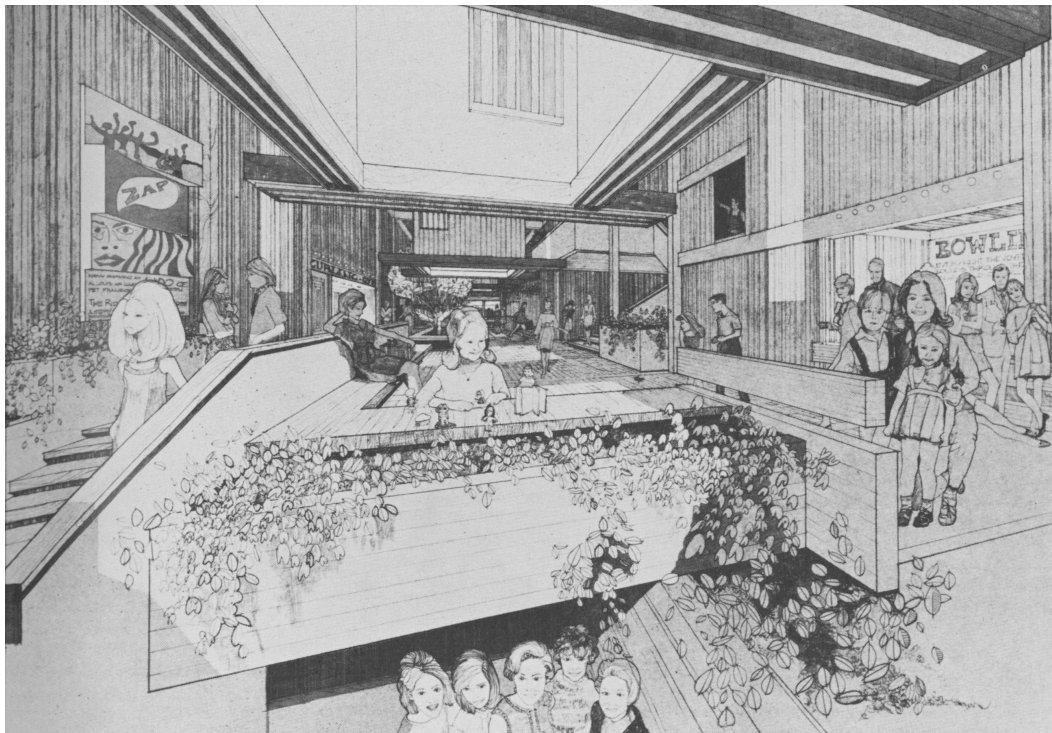


Image 27
from "New Town for Churchill Falls," 21.

Sixteen eyes smile at us from beneath perfect blonde coifs. Ten from a quintet of what look like housewives and six from a warm trio of mother-and-child-and-child.¹⁵⁸ Of the twenty-eight figures visible, only four appear to be men, all of whom are in the company of their wives. Prominent vine-like plants overflow their planters and a round puff of tree catches rays from a skylight. At the vanishing point of the image, another woman sits relaxed with her hand behind her head, and a smiling girl plays with four dolls and a book on a low wooden bench. If this Northern company town has “nine prostitutes, twelve bootleggers, and a permanent floating poker school” like so many others, we certainly will not find them here.¹⁵⁹ This 1968 artist’s rendition assures us that after its inauguration, the hard, violent, and earthly labor which produced Churchill Falls will become subliminal—no longer the grand spectacle it was during construction.¹⁶⁰ In its place will be the “great indoors” of the Donald Gordon Town Centre, a social space of comfort and control which Churchill Falls’ architects, like those of other Northern settlements, felt was a necessary accommodation for the town’s women who would otherwise be living in what they saw as a harsh, wild environment.¹⁶¹

¹⁵⁸ “New Town for Churchill Falls,” 21.

¹⁵⁹ Pearson, “Recreational Land Use Planning,” 11.

¹⁶⁰ Larkin, “The Politics and Poetics of Infrastructure,” 336; *Power in Perpetuity*: This 1967 documentary epitomizes the spectacular quality of Churchill Falls during its construction phase.

¹⁶¹ Hemmersam, *Making the Arctic City*, 95, 177.



Image 28:
Excavation of the Churchill Falls powerhouse.
from *Brinco*, photo insert 1, page 10.

However, despite putting most of the town's services under one roof like other notable cold settlements, architect Edouard Fiset remarked that moving to Churchill Falls is not like "going from one planet to another, as you are...when you go to the Arctic."¹⁶² For all its peculiarities—its isolation, its ambiguous economic status as neither truly extractive nor regenerative, and its monopolistic employer—the town of Churchill Falls is remarkably mundane, plainly of this Earth. 1968 plans include apartment housing in twelve-unit, two-story buildings with detached garage structures and basements, built of concrete, insulated with asbestos, and clad in wood planks.¹⁶³

¹⁶² For example. Whittier (Alaska), Udachny (Siberia), Radisson (Quebec), Frobisher Bay/Iqaluit (Nunavut). See Hemmersam, *Making the Arctic City*, 177–79; "New Town for Churchill Falls," 20.

¹⁶³ "New Town for Churchill Falls," 20.

The private homes, just uphill to the north, were planned in five models, either one or two stories, up to four bedrooms, with a maximum size of 1,540 square feet—spacious by contemporary standards.¹⁶⁴ Despite this small luxury, both the apartments and private homes were as unexceptional as other suburban-style developments happening around Canada in this period.

What unique adaptations to the subarctic climate Churchill Falls’ plans did have were subtle and could be easily mistaken for mere choices of style. Garages protrude from the front of the private homes to cut down on driveway snow shoveling, and streets only have homes on one side, so plows can push snow away from entrances rather than into them. Although compact enough to walk, the planners note, their town design accommodates the car because it “has become an essential accessory,” as if leaving the house without one was like leaving naked.¹⁶⁵ A small semi-enclosed area is formed between each home and garage and the next, which faces south to receive sunlight as a “private play area” for young children.¹⁶⁶ Altogether, the effect is like a subdivision anywhere else in North America, save for each front lawn’s patient, veiled snowmobile.



Image 29:
An apartment.
from Google Earth, *1801 Ressegieu Drive*.



Image 30:
A private home and snowmobile.
from Google Earth, *1 Jackson Avenue*.

¹⁶⁴ In 1975, the average size of a house in Canada was 1,050 square feet. See Banerjee, “Our Love Affair with Home Ownership Might Be Doomed,” para. 3; “New Town for Churchill Falls,” 20, para. 13.

¹⁶⁵ “New Town for Churchill Falls,” 20, para. 12.

¹⁶⁶ “New Town for Churchill Falls,” 20, para. 14.

At Frobisher Bay on Baffin Island, more than 700 miles north-northwest of Churchill Falls, the Canadian Department of Federal Works had proposed a radically modern vision of a Northern settlement in 1958. 4,500 residents would live in eighteen silo-like towers around a central dome that contained a wide array of urban amenities including a church, fire station, restaurants, and funeral parlor.¹⁶⁷ In a hillside beyond, an underground nuclear reactor would power the entire settlement, presumably fueled by yellow-cake uranium mined at Makkovik on the east coast of Labrador.¹⁶⁸



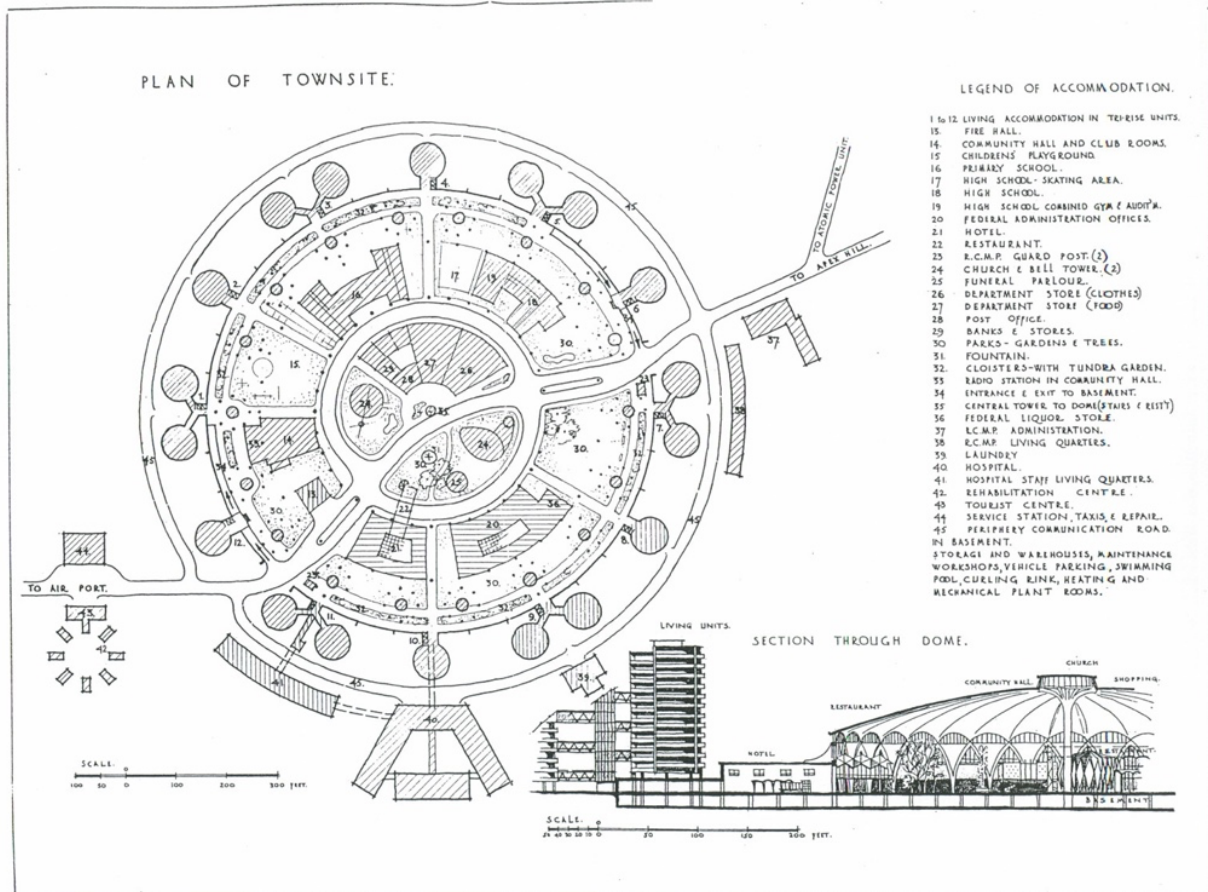
Figure 11:
Frobisher Bay and Makkovik
from Google Maps.

Ten years after this proposal, Churchill Falls Generating Station was already under construction, its vast underground powerhouse blasted out from solid granite more than a thousand feet underground. Yet, at the surface, conventional wood-paneled homes lined one side of weather-exposed streets designed for snowplows. Someone's front lawn is where the dome's perimeter might have been. Streets named for Brinco executives—Johnson, Lethbridge, and Cattle Avenues,

¹⁶⁷ Hemmersam, *Making the Arctic City*, 95.

¹⁶⁸ Hemmersam, 96; Smith, *Brinco: The Story of Churchill Falls*, 76–77.

plus Ressegieu Drive—might have been Otto St., Bubner Ave. Tange Wy., or Arup Blvd, those great, if hubristic, visionaries of architecture's high modernism.¹⁶⁹



THE TOWN SITE PLAN ILLUSTRATING THE VARIOUS BUILDINGS WITHIN THE SCHEME. NOTE THE REASONABLE AREAS ALLOWED FOR PARK DEVELOPMENT.

Figure 12:
1958 plan for Frobisher Bay.
from Gardner and Fancott, "Frobisher Bay: The Design of Accommodation for a Community of 4500 People," 5.

¹⁶⁹ Hemmersam, *Making the Arctic City*, 180. These architects and engineers are Frei Otto, Ewald Bubner, Kenzo Tange, and Ove Arup. Together they proposed an even more strikingly futuristic Arctic city in 1970, which would be enclosed by an even larger dome.

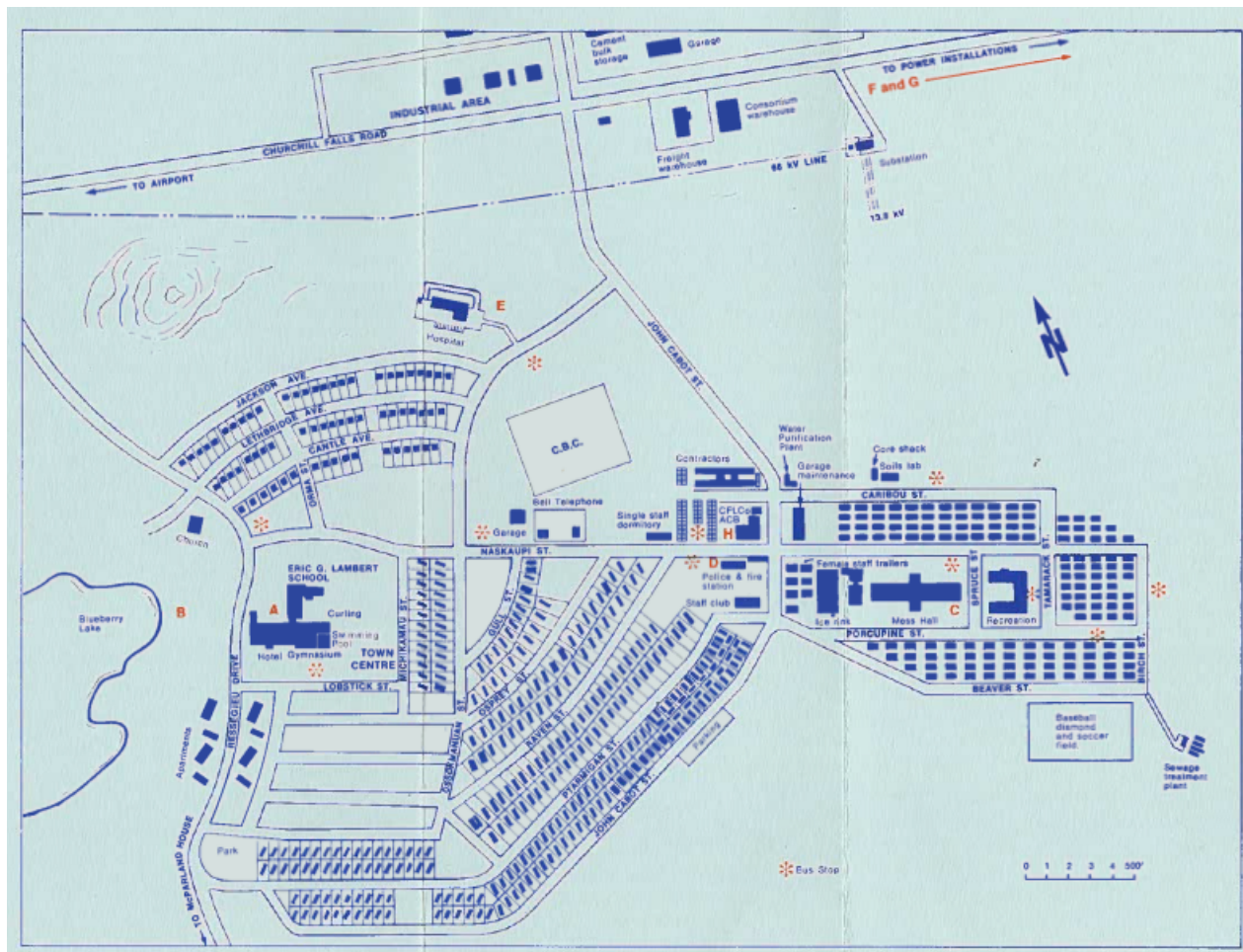


Figure 13:
Map of Churchill Falls in 1972.

from *Churchill Falls Power Development Inauguration* (Churchill Falls: CF(L)Co., 1972).
courtesy of the Memorial University of Newfoundland St. John's Center for Newfoundland Studies.

Churchill Falls is not nearly so otherworldly. In fact, as the town's architect assured us in the promotional article, it is decidedly *not* another planet, though he tells us not to imagine growing a southern Ontario garden here.¹⁷⁰ The houses are wood-paneled, not polymer-clad, and the town center is a blocky office-like building, not a streamlined dome. The streets are laid out to accelerate the snowplows, for it is the warm car seat rather than the enclosed walkway which connects the

¹⁷⁰ "New Town for Churchill Falls," 20, para. 9: "You are not going from one planet to another, as you are, in effect, when you go to the Arctic and the permafrost....Nevertheless, you should not kid yourself—you can't expect to grow the same kind of garden at Churchill Falls as you would in southern Ontario."

town's structures, just like any good car-centric suburb.¹⁷¹ Both Frobisher Bay and Churchill Falls were planned with the assumption that their populations would work for a single entity—a military airbase and the power generation facility, respectively—yet only the former reflects this panoptic social dynamic in its centralized urban plan (Figure 12).¹⁷² Churchill Falls' detached housing is intended to provide privacy for the domestic spaces of social reproduction crucial to its capacity as a renewable extractive settlement.¹⁷³ The resulting decentralized form masks the town's infrastructural function as a generation *node* in the electrical grid (Figure 13).

A great source of energy lies hidden just beyond the town, entombed in the granite below, replete with great boards of blinking lights, long echoing hallways, and enormous unstoppable machines rumbling within. Below the linoleum, though, it is only cold lake water which rushes past the turbines, not high-tech steam heated by a uranium fuel element like Frobisher Bay's underground nuclear reactor.

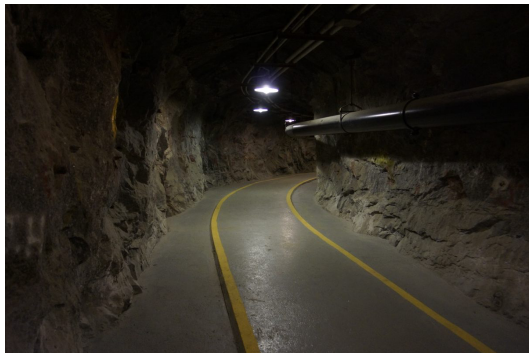


Image 31:
Vehicle access tunnel
Escape Tunnel by Rob Tallia



Image 32:
Powerhouse turbine hall
Interior of Churchill Falls Powerhouse by Kevin Bisset

¹⁷¹ “New Town for Churchill Falls,” 20, para. 12: “Although the community will be sufficiently compact for people to walk everywhere, planners say that the automobile has become an essential accessory to most people and they have provided for its use in Churchill Falls.”

¹⁷² Gardner and Fancott, “Frobisher Bay: The Design of Accommodation for a Community of 4500 People,” 5.

¹⁷³ “New Town for Churchill Falls,” 21, para. 10; Eric G. Lambert School, “Junior High (Gr. 7, 8, 9) Supply List.” Note that the social reproduction of labor is evident in Churchill Falls' school supply list, where steel toe boots are required for “Skilled Trades” classes which begin in the seventh grade.

Those close to the Churchill Falls project were aware of its limited visibility, and perhaps even anxious about it. In a 1970 session of the provincial House of Assembly, which mostly covered relations with the labor unions who represented the workers and engineers of the project, M.P.P. John Crosbie noted, as an aside, that “[w]e are not going to be able to see the Falls, once the power, once everything is ready and power production starts, Churchill Falls will disappear.”¹⁷⁴ While Crosbie refers here to the actual waterfall, which at this point was a small-time tourist attraction to be seen from a bush plane, there is an acerbic ambiguity to ‘Churchill Falls’ in his statement that was surely calculated to irk his interlocutor, Premier Joey Smallwood.¹⁷⁵ The two had an icy relationship: Crosbie was an upstart politician who challenged Smallwood’s authoritarian inclinations, especially with regard to the Churchill Falls plant, which was the Premier’s grand pet project.¹⁷⁶ In this aside, Crosbie reminds Smallwood that there is a slippage going on between the waterfall and the infrastructure project; ‘Churchill Falls’ stands for ‘Churchill Falls Generating Station.’ Both the waterfall and the construction project end simultaneously, silence replaces the crack of dynamite and the gush of rapids. When the system works, it becomes subliminal.

¹⁷⁴ M.P.P stands for Member of Provincial Parliament. It is equivalent to a member of a U.S. state’s general assembly. “Verbatim Report,” Tape 1241, page 7. In online PDF, it is page 16.

¹⁷⁵ Canadian equivalent to a U.S. state’s governor.

¹⁷⁶ Maher, “John Crosbie, Newfoundland and Labrador Political Giant, Dead at 88.”



Image 33:
Premier Joey Smallwood fishing in his eponymous reservoir,
the second most extensive on Earth.
from *Brinco: The Story of Churchill Falls*, photo insert 2, page 10 (top)

Unlike the science-fiction-esque plans for other Northern settlements whose utopian designs explored the “form-generating potential” of the boreal landscape and climate, engineers of the town of Churchill Falls considered their task “like construction anywhere else” and merely a problem “of logistics.”¹⁷⁷ According to the 1968 promotional article about the town, the availability of abundant and reliable electricity offered “unusual opportunities in planning the new community.”¹⁷⁸ That is, the unusual opportunity of energy abundant enough to build a typical Canadian town of suburban homes, yards, and school buses in a location which, many architects imagined, would otherwise require sophisticated climatic adaptations to reduce energy consumption—domes have a minimal surface area for the volumes they contain.¹⁷⁹ However,

¹⁷⁷ Hemmersam, *Making the Arctic City*, 181; “New Town for Churchill Falls,” 20, para. 15.

¹⁷⁸ “New Town for Churchill Falls,” 20, para. 2.

¹⁷⁹ Eric G. Lambert School, “Town Map for Bus Routes”; Hemmersam, *Making the Arctic City*, 168.

Donald McParland, president of CF(L)Co., the Churchill Falls development corporation, saw things exactly the opposite: ““The new community will mark a milestone in the ability of Canadians to *adapt* to northern conditions.””¹⁸⁰ Climatic adaptation is ambiguous. Does the Churchill Falls project adapt Labrador’s landscape to serve ‘Canadian’ conditions? Or do the town’s inhabitants adapt to Labrador’s conditions? At what scale does a structure stop adapting to and start shaping its environment? Perhaps the generating station and network of reservoirs are not so different from the high modernists’ domes. There is, in effect, an invisible dome over Churchill Falls, composed only of charged electrons which heat homes and keep the mall’s lights on.

What makes the town of Churchill Falls a site of exception makes it appear completely unexceptional, compared to the traditionally alien sites of energy like offshore oil rigs, high dams, wind farms, and fields of solar panels. The town is an erasure of an erasure: its inconspicuous suburbanism erases the peculiarity of the generating station which it supports, a generating station which in turn erased the waterfall on which they all rely, for name and existence.

Dug into the ground, Churchill Falls prompts a turn to geology, the final stratum of this investigation. Human time ceases to register here, and the coherence of a “globe” collapses in this realm of fragmentary geochemical activity. At the surface, information travels in billion-of-a-second pulses; here, millions of years bleed into billions.

¹⁸⁰ “New Town for Churchill Falls,” 19, para. 2. Emphasis mine.

Stratum 1

From Cloud to Ground: Requiem for A Private Jet

scale: 6,000,000,000 kg of iron ore per year, 1,000,000,000 years



~

Churchill Falls' executives never saw this erasure, though. At 6:32pm on November 11, 1969, a jet carrying Brinco's president and his executive assistant, the vice president of finance, the vice president of construction, the general manager of construction, the assistant general manager of construction, a pilot, and his copilot flew into the excavated terraces of an open-pit iron mine.¹⁸¹ All eight died instantly.

The next day, the province's acting Premier Dr. Fred Rowe made an official statement that "the tremendous amount of knowledge in the heads" of the men who had perished "would not be easy to replace." Immediately, he came under fire for such a cold statement of grief, though the sentiment was shared by others, who simply had the tact not to put it into words.¹⁸² While it was a jet that had crashed, Rowe's statement would apply just as well to a computer: he implied that the specific men who led Brinco were not really individuals, but fungible units of information storage

¹⁸¹ "Brinco Chief, Businessmen Killed in Crash"; Smith, *Brinco: The Story of Churchill Falls*, 321.

¹⁸² Smith, *Brinco: The Story of Churchill Falls*, 323. Joey Smallwood on vacation in Panama at the time.

whose personal qualities had little bearing on the masterminded project which was inevitable anyways, for Churchill Falls merely “finished an engineering feat fortuitously begun by nature.”¹⁸³



Image 34:

A DH125, Brinco’s executive jet. Top speed, 500 mph. from BAE Systems, “HS125 Srs1B G-511”



Image 35:

“Smallwood’s Mine” at Wabush. from Gateway Labrador, “Wabush”

The ambiguous meaning of “finish” becomes clear in the aftermath of the crash: did the generation station project *complete* the work of nature, or did it finish off—*kill*—the work of nature? Was the powerhouse not the demise of Churchill Falls? In a memorial service for the widows and now-fatherless children of Brinco’s executives, the new president of the company consoled them with the epitaph “*Si monumentum requiris, circumspice:*” ‘If you want a monument, look around you.’¹⁸⁴ With just four words, the entire landscape of Labrador that supplies the project with energy in the form of flowing water was cast as a site of mourning. However, the sepulchral quality of the project was latent from its inception. In his first visit to the site, Prime Minister Trudeau Sr. remarked that Churchill Falls was “[b]igger than the Catacombs...and I suspect...a lot more

¹⁸³ Smith, vi; Sullivan, “Drop the Mouse and Step Away from the PC,” para. 11. According to a 2005 NBC article about computer crashes, ‘crash’ refers to when the head mechanism of a hard drive ‘crashes’ into the spinning metal disc which physically stores the data.

¹⁸⁴ Smith, *Brinco: The Story of Churchill Falls*, 323. Sir Val Duncan, the successor, was quoting Sir Christopher Wren’s epitaph, which is on the floor of St. Paul’s Cathedral in London.

useful.”¹⁸⁵ According to nineteenth century explorer Henry Bryant, the Innu believed that two women-spirits dwelled beneath the original Churchill Falls, who were condemned to toil dressing deerskins there because they had fallen over the edge while searching for *firewood*—for energy.¹⁸⁶ While the provenance of Bryant’s account is weak, it nonetheless resonates with the official translation of Churchill Falls’ true name, *Patshishetshuanau*, “Where Current Makes Clouds of Vapor.”¹⁸⁷ In the place of clouds is *the cloud*. Bulk Infrastructure’s node global network exists in Goose Bay on account of this place’s sacrifice for the higher purpose of energy extraction.

The day after the crash, the *Montreal Gazette* chided Brinco for overlooking the risk of having its executives fly together. However, they acknowledged that the radios and instruments that typically guide aircraft often fail in Labrador, according to “any businessman or reporter who has made a number of trips” there. Without them, the pilot must “drop below the clouds to see if he was where he thought he was.”¹⁸⁸ On November 11, he was not. Mistaking the end of the runway for its beginning, pilot Jack McLeod descended through dense fog by instrument alone, unaware that he had overshot his destination. He landed one hundred feet below the surface, into the terraces of open pit mine.¹⁸⁹ The smoldering wreckage of the jet scattered over iron ore deposits which formed in the late Precambrian, when the earliest forms of life emerged on a dead planet.¹⁹⁰

¹⁸⁵ Smith, 338. Note the nod to Quebec-France solidarity.

¹⁸⁶ Bryant, “A Journey to the Grand Falls of Labrador,” 38.

¹⁸⁷ Innu First Nation, “Pepamuteiati Nitassinat,” 2008.

¹⁸⁸ Finn, “Most Firms Have Curbs on Flying,” para. 16.

¹⁸⁹ Smith, *Brinco: The Story of Churchill Falls*, 321. Ironically, the mine was known as “Smallwood’s mine,” in reference to the province’s enterprising leader, Joey Smallwood.

¹⁹⁰ Klein Jr., “Mineralogy and Petrology of the Metamorphosed Wabush Iron Formation, Southwestern Labrador.”



Image 36:
Wabush grunerite iron ore, age 1,000,000,000.
from The Hudson Institute for Minerology, “Smallwood Mine, Labrador, Canada”

Jack McLeod may not have been where he thought he was, but are we? Must a return to the ground be violent, even with this archaeology’s careful rappel? Have we truly reached the ground, or are we still in the cloud? Sandwiched between two news items about the aftermath of the crash, there is a peculiar photograph of “Mlle. Honeywell,” a woman dressed as a robot, with the painfully dated caption “THE PERFECT WIFE?” (Image 35).¹⁹¹ She stands on the convention floor to advertise Com-Share Canada Ltd., a firm which used a teletypewriter, coupler, and telephone to route data to a central processing facility in New Jersey, enabling those without their own computers to compute. For just \$45 per month, the article says, a small business like a gas station can be “relieved of the chore of book-keeping” by means of storing their transactions offsite in a system like those that would evolve into today’s cloud.

¹⁹¹ Wilson, “Time-Sharing for All.” Worse yet is the last line of the caption: “Is she a girl or a robot? Only her electrician knows for sure.” For more on the gendered quality of time-sharing technology in this period, see “Intimacies of the User: From Stolen Look to Stolen Time” in chapter 2 of Tung-Hui Hu’s *A Prehistory of the Cloud*.

Borden fills the gap

Henry Borden took over today as chief executive officer of British Newfoundland Corp. following the death of president Donald McParland on the Labrador air crash yesterday.

Work at the site has passed the quarter-mile with more than 1,600 men in the field.

McParland was enough by itself to create large problems.

'Falls will be their monument'

Henry Borden, chairman of British Newfoundland Corp., today expressed shock and sorrow at the death of Donald McParland and other company executives.



THE PERFECT WIFE? She can operate computers, do the bookwork, and will then stand quietly in the corner awaiting her next order.

Manhattan decision next year

NEW YORK — The decision on whether or not to build giant gas-burning oil-burning plants in Long Beach will be made by mid-1970, M. A. Wright, chairman of Humble Oil, told a press conference on returns of the Manhattan to New York City today.

T takeover bid

Negotiations are going on between SNA, a Quebec auto processing and communication company, and Orix Films of Montreal, for the takeover of the film company.

Port Colborne men fight Inco peace

Ballotization has been held by Port Colborne. A 1,700-member local of the steelworkers' union has rejected an International Nickel contract proposal already accepted by leaders of the industry.

Most firms have curbs on flying

By PATRICK FINN. The jet crash in which six top executives of the Churchill Falls project died yesterday may encourage many Canadian firms to review, or at least take another look at, their rules about executive flying.

Business flying is essential, of course, especially in Canada, where distances are so great. But many firms feel that certain safety precautions must be taken so as not to cripple the entire organization.

Store bonds carry 9 1/2%

The \$15 million bond issue planned by the Simpsons Ltd. store group is coming forward now. It is a 20-year issue with a 15-year period feature, carrying a coupon of 9 1/2% and offering a second year of a 10% underwrite.

Continental Can Company of Canada Paper Products Division Appointments



WILLIAM J. BYERS and BARRY W. SMITH. Two senior appointments in the paper products division of Continental Can Company of Canada Limited have been announced by George L. Urdahl, vice-president, paper products.

Sales finance criticized

OTTAWA — Consumer Affairs Minister Joe Starnoff yesterday criticized Canadian sales finance companies on several points contained in their brief to the committee studying high interest rates and inflation.

Canada Packers Limited

Dividend Notice. NOTICE is hereby given that a quarterly dividend of 14¢ per share has been declared on the shares of Canada Packers Limited for the period ending December 31, 1969.

Time-sharing for all

Telephone, all data is processed through a central computer located in New Jersey. "It is hoped, the company says, 'to eventually have a computer centre in Canada.'"

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Image 37: Business section of the Montreal Gazette on November 12, 1969, from Newspapers.com.

Although coincidence placed Mlle. Honeywell and the crash on the same page, their conjunction raises the crucial question of ambivalence in this project's effort to ground the cloud. Should we enter the doomed loop of Mlle. Honeywell's virtualization? Should we concede that the that the *only* planetary subject is the digital subject? Or should we turn our backs on the planet-user, and bore into ever lower strata in search of a pure planetary subject?

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