

Meditations on Montréal Stone

by Levi Bruce

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Levi Bruce

Abstract

This thesis is a meditation on the potential of stone. Meditating means looking beyond the so-called practical use of stone in order to explore its ephemeral, cultural and other properties. My thesis explores the history and possibility of Montréal stone and its potential to act as an architectural and programmatic agent beyond conventional contemporary properties of the material. The Phi Center - an arts institution in Montréal - and the island of Tiohti:áke itself are used to test this project and focus on a local understanding. Through site analysis and research at a geological scale, we open up to more significant landscapes and larger frames of time, a way of seeing beyond the parameters of an architectural brief. The thesis brings forward three ways of looking at stone: first, by analyzing what is forgotten; second, by accumulating and processing lithic data; and finally, by proposing experiential methods to engage with the material.

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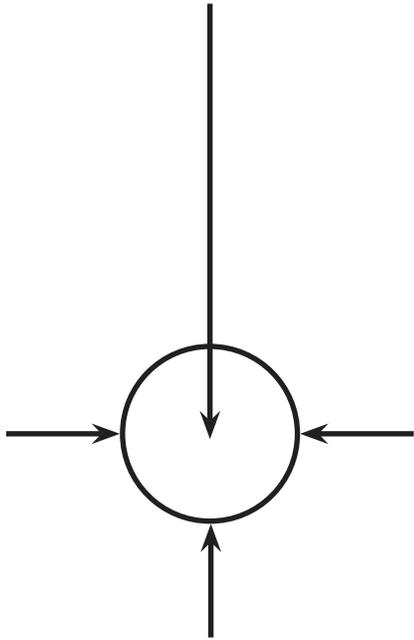
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Introduction [First Meditation]

Backwards and Inwards



Introduction [First Meditation]

I have a deep, personal connection with stone. Veins and strata of this connection trace back to my upbringing and the surrounding environments. This personal history is the catalyst for this thesis. This lithic history is tied to me through the geological landscape of my hometown, the art practice of my grandfather and my own creative work outside the realm of architecture. Stone carries and works with deep time. Stone remembers and is tied to our own memory and histories.

I grew up in Grey County Ontario along the Niagara escarpment, a limestone cliff formed through uneven erosion, which runs through Ontario and up into the Bruce Peninsula. The town I lived in, Owen Sound, faces this stone formation, which I encountered on a daily basis. Owen Sound is built around its imposing features and requires you to descend and then reascend to traverse the town. The power of stone and geology was ever-present in the city's day-to-day life, a ruler in the form of time and earth. The escarpment running through my hometown acts as what Gianni Pettena, an Italian architect, artist and theorist prominent in the avant-garde movement, calls non-conscious architecture¹. This notion can be seen in his work and documentation done in the American midwest in the 1970s, artworks that force the viewer to face the relationship between nature and earth, man and architecture, and the blur between these elements.

I must also mention the work of my grandfather, John Bruce, a Philosophy professor who, in retirement from the 1980s to 1990s in Southgate Ontario, explored many artistic mediums, but primarily stone masonry and poetry. On his rural property outside of the town of Durham, he constructed two buildings through self-taught masonry techniques and with salvaged stone. The first is a two-story abbey with a pitched roof and bell completed in the late 1980s, and the second is a stilted pigeonier, also known as a dovecote, completed sometime in the 1990s (Fig. 3-5). Additional to these buildings are stone extensions on his cottage and various stone walls around the property. I spent time inhabiting these structures, touching them, and investigating their oddness as a child. I was fortunate to feel their warmth and cold, smoothness and roughness in detail. This **was** research; I intuitively and discreetly learned about stone through my one-on-one experiences with these buildings. I grew up with stone. I remember

Introduction [First Meditation]

through it, too.

As Suzanne Ewing, a professor of architecture at the University of Edinburgh who specializes in theory of field work, notes “Site is a place to practice in/on/with, and field is a place to learn from/in...”². It is important to understand that there is much to learn at the scale of 1:1 for understanding sites, materials, and history as Ewing suggests. The opportunity of being around these structures as a child and often through play allowed me to engage with material in a manner that showed me alternative perspectives.

Lastly, I need to acknowledge my own practice of stone stacking and balancing that I have been actively engaged with over the past couple of years as a meditative and artistic practice (Fig. 7). A technique that also has merit as an anarchistic architectural practice, an idea I presented as part of Queen’s university’s Context & Meaning conference in January 2022, which was titled and focused on Art and the Anthropocene. My stacks and works of balance appear as sculptural works, but in reality they are more so interventions and performances. Like in the work of Gianni Pettena I am playing and intervening within the site’s landscape. As I release my hands on the stack of rocks I hand back the work to nature, to chance, to possibility. As it is released the works quiver, they may fall momentarily or in hours or even in days. As I am constructing these works I am also using them as a tool to investigate and map the site’s fabric. I get to understand the different pieces of this world, how they work, how they feel, how they look and how they interact. It is a way to understand that nature and earth are not untouched as conservation can lead you to believe. As I inhabit and act on the landscape I am implicit in how the space unfolds and becomes intertwined in its existence. My stacking acts as my way of acknowledging this intervention. I attempt to get dirty within the site, ignoring the divide between human and nature. I am playing, exploring.

My history with stone prompted this thesis: to explore its potential, and to begin with what has been lost, hidden or forgotten. I explore stone in its local framework, understanding its past, present, and future: how it is formed, how it is manipulated, and how it will age within the site of its quarry, the site of the building, and everything in-between.

Introduction [First Meditation]

The thesis is broken and structured into three chapters. The first addresses stone's potential, addressing its forgotten elements and future possibilities through theory and precedents. The second addresses stone in Montréal, where I reside, through research and the production of an index/atlas. The third chapter uses the proposed site of the new Phi Centre's arts complex as a stage to explore the ideas of stone architecture through a series of architectural and programmatic proposals of interventions. This thesis becomes an active meditation, a method of thinking on and through stone, an ongoing and incomplete atlas of how to navigate this material, how to find oneself within it, and how to commit to what it naturally demands. This thesis looks to allow stone to speak and tell its story just as it allows me to tell mine.



Fig. 1 - Niagara Escarpment

Fig. 2 - Diagram of Niagara Escarpment across Ontario and the United States

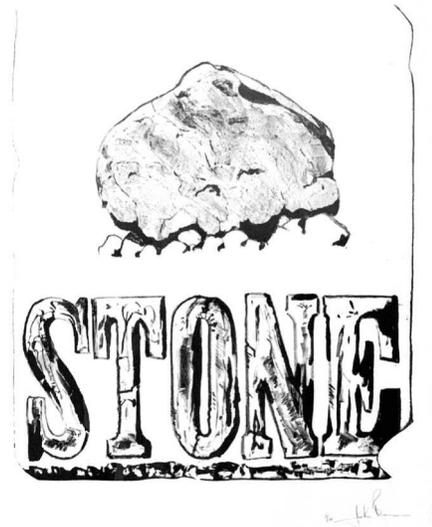
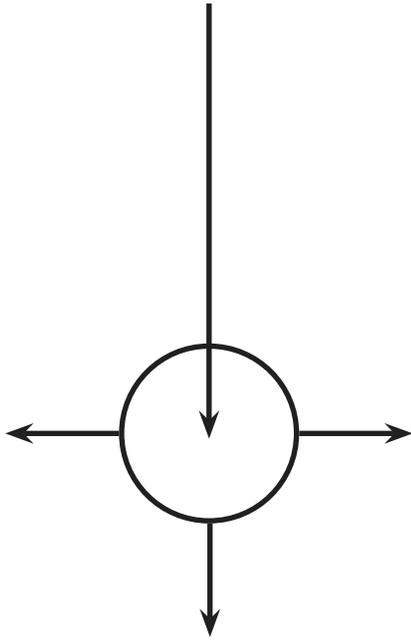


Fig. 3 - Pigeonnier by John Bruce
Fig. 4 - Stone Abbey by John Bruce
Fig. 5 - Detail of Stone Abbey by John Bruce
Fig. 6 - Stone print by John Bruce



Fig. 7 - Rock Stacks by Levi Bruce



Stone, often, is seen as something that needs to be tamed and manipulated to function our human and capital needs. The majority of contemporary buildings that employ stone as a material do so in a manner that strips the material of many of its natural properties as well as its ephemeral properties and aura. In most cases, stone is cut into thin sheets and employed as part of a rain screen, or it is used in a luxurious manner such as highly polished, mirror-like marble counters or floors. Many of stone's most beautiful and exciting attributes have been forgotten despite their architectural merit. Although overlooked, we can still find traces of these conditions and retrace their importance. Stone contains its own unique permanence, which allows us to reflect and find the material again in a state of its true potential. It is clear looking at the old quarters of cities like Montréal where I reside, among many other historic cities, that stone has been embraced fully as a material in the past, but elements of its potential have not sustained into the present.

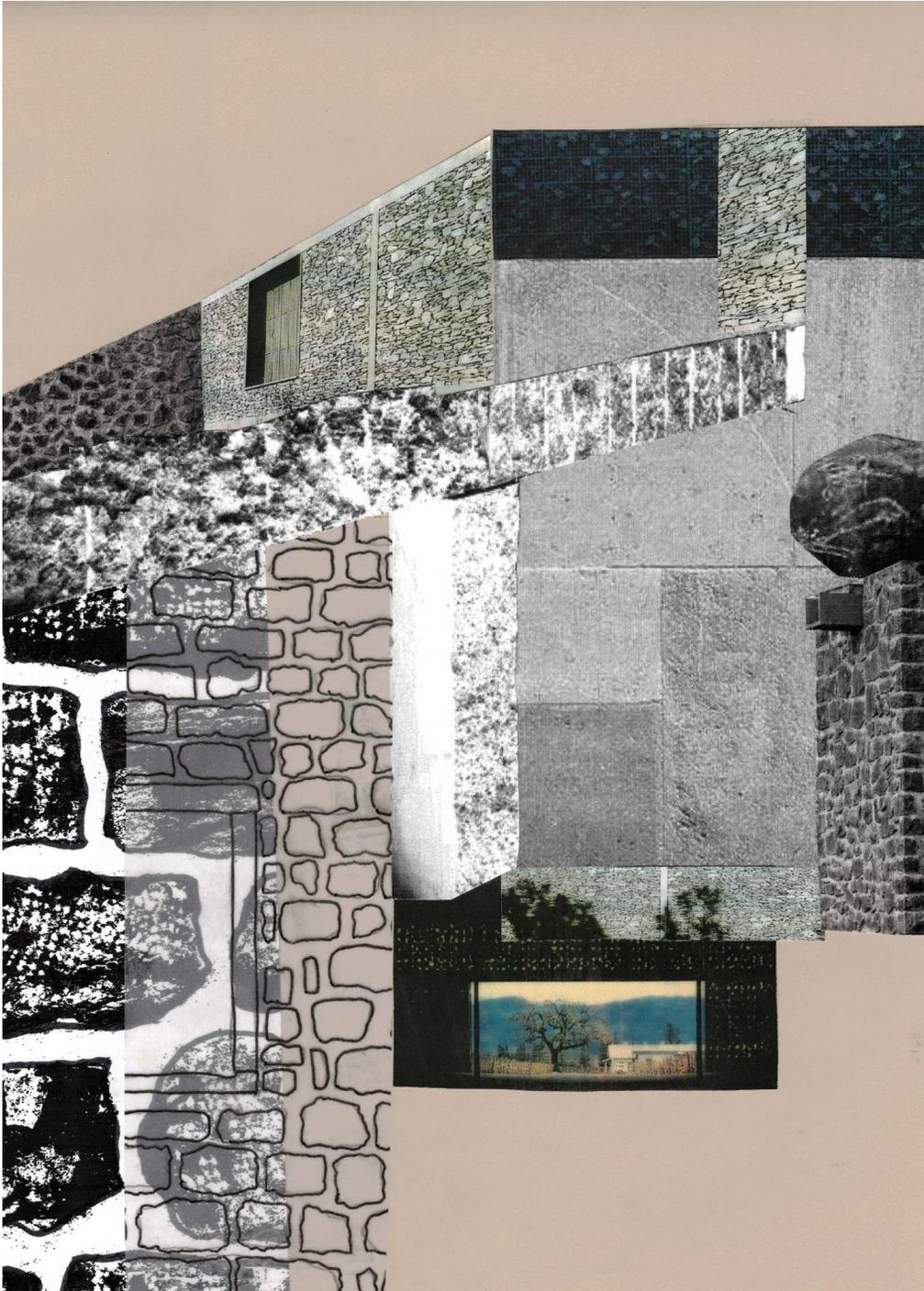


Fig. 8 - Exploratory investigation into new ideas of stone through collage, using the medium to break from traditional perspectives and scales.

To embrace stone means to embrace its subtleties, grains, and structures, which in turn present us with the beauty of its history and a representation of time itself. In this sense, stone is a beautiful tool to acknowledge a history before us, our existence and effect on the world. Stone and time or more appropriately lithic time as a concept to embrace in the realm of architecture can be approached in two manners. First to acknowledge its geology and deep time as a manner of time traveling millennia before us. As well as, to recognize stone and stone architecture as artifacts and ruins, and the potential in acknowledging this idea of stone as perpetual ruin. We can look at time from the point of view of Bruno Latour, a French philosopher and theorist known for his work on the subject of technology and culture, to understand its importance in stone and stone architecture. Latour states that the past is not simply “surpassed” and put behind us, but it is something that is “revisited, repeated, surrounded, protected, recombined, reinterpreted and reshuffled”³. This idea is ever-present in stone and in its potential. In its strata, we can see many of the ideas that Latour suggests, and in architecture, we can see others. Stone is a beautiful tool in this sense to understand our earth’s past, present and future.

This idea is exemplified in Dan Hanganu’s work, a Romanian born Canadian architect, Pointe-à-Callière Montreal Museum of Archaeology and History; a project that revisits, reshuffles, protects and reinterprets stone and history in Montréal (Fig. 11-12). Hanganu uses stone as the link to this history in the museum’s design, splitting the building into three elements. The first and oldest element is the fieldstone crypt, the second is a former masonry customs house, and the final, new section - the Ephron - is built using the iconic Montréal grey stone. To understand the idea of using stone as a method to time travel and acknowledge history, we can look to Johnathan Hill, professor of architecture and visual theory at the Bartlett School of Architecture, and his concept of architecture as a monument and a ruin. A vision in which architecture attempts to “envisage the past, the present and the future” in one⁴. In the description listed on Hanganu’s website, the Montreal Museum of Archaeology and History is noted as containing six centuries of history. Considering that it is a piece of architecture that utilizes stone we can say, rather, that the building includes a much more extensive background that contains **millions** of years of history.

In this sense and scale, the six centuries of history are the present, and the monumentalizing and museumification of this present is what can become the future.

Alongside the functional work of Hanganu we can study the works of Robert Smithson, an American land artist who investigates time and geology through his installations and large scale earth works. His pre-eminent work “Spiral Jetty” asks us to consider our relationship and approach to the earth in connection with lithic time (Fig. 9-10). At Spiral Jetty, Smithson highlights how our agency as humans is just a “brief moment in the earth’s deep history”⁵ through a project that explores nature and its power. He wants to signify the power of earth and stone, and contemplate time’s layers in the physical materials and strata. There is knowledge to be obtained through recognition of the earth’s immense existence in geological time. In the case of stone and architecture and inspired by Smithson, we can understand that by using the earth in its native manner of existence, we can manipulate it to speak of its history, power, and feeling.



Fig. 9 - Spiral Jetty by Robert Smithson

Fig. 10 - Construction of Spiral Jetty by Robert Smithson



Fig. 11 - Pointe-à-Callière foundation and Museum
Fig. 12 - Pointe-à-Callière Museum by Dan Hanganu

“Stone must be allowed to make its own impact.”

Peter Zumthor

Atmosphere is something that we understand intuitively. It is a feeling and base understanding of space, building, or piece of architecture that comes to us naturally. Peter Zumthor, a Swiss architect known for his minimal and experientially focused work, expands on this idea in his short but succinct book *Atmospheres: Architectural Environments. Surrounding Objects*, Zumthor explains *atmosphere* as an immediate response to a space, the quick reaction of our feelings to the environment. This understanding is almost like magic - the magic of thought, as Zumthor explains⁶. It is an understanding of how you feel within a domain and how light, sound, weight, texture, and temperature move you. This idea is easily understood through music, a medium known for atmospheric and auric sensibilities that move a listener in a specific manner. This idea is transferable to understanding environments but is more complicated as it goes beyond a single medium. Zumthor believes that architecture should embrace this sensibility - much like a composer - attempting to touch and make the audience feel the space and understand it through the atmosphere.

Stone is a beautiful material whose atmospheric qualities are essential for its potential. Each individual stone can contain its own unique aura and its own atmospheric possibilities. Stone speaks on its own, telling its personal story in its exceptional fashion. To understand the importance of atmosphere and its application in the world of stone, we can look at Zumthor's Therme Vals in Switzerland, a project that emphasizes the potential of stone through its material aura and atmosphere (Fig. 13). Zumthor utilizes the local material of stone in its design, embracing its weight, colour and light throughout the project. Zumthor recollects the sudden feeling of seeing and feeling the stone in the town of Vals, and describes the grey Augen Gneiss that is ever-present in the town, on roofs, scattered quarry cut stone, boulders resting on the slope, and rock faces cut out of the landscape⁷. Zumthor, following the pull of the stone, began looking and feeling the material further, finding some of its unique properties like mineral structures, iridescent tones, and the Augen Gneiss's white eyes⁸. Zumthor acknowledged the stone's power of the atmosphere, fully embracing it

as the primary focus, letting the stone speak. This is evident, too, in the project documentation. Stone is paired with water and light, and one can quickly understand the feeling of an atmosphere that Zumthor utilized in his design of the baths.

As Zumthor states, we need to let stone speak on its own, allowing its atmospheric potential to emerge⁹. Ferdinand Cheval, a French postman who spent over thirty years building his “Palais idéal” out of found stones, understood this idea (Fig. 14). He explains it as such: “I said to myself: since Nature is willing to do the sculpture, I will do the masonry and the architecture”¹⁰. His “Palais Idéal” started simply with a stone speaking to Cheval. In the simple act of picking up a small rock and acknowledging its potential, his outstanding and long project with stone began. The Palais Ideal is an eclectic construction built and designed by hand without traditional plans or drawings, where we can see Cheval embracing each stone individually and utilizing it in the appropriate place. In this project stone is once again a ruin, the fallen stone is an architecture before it becomes a building under the hand of Cheval.

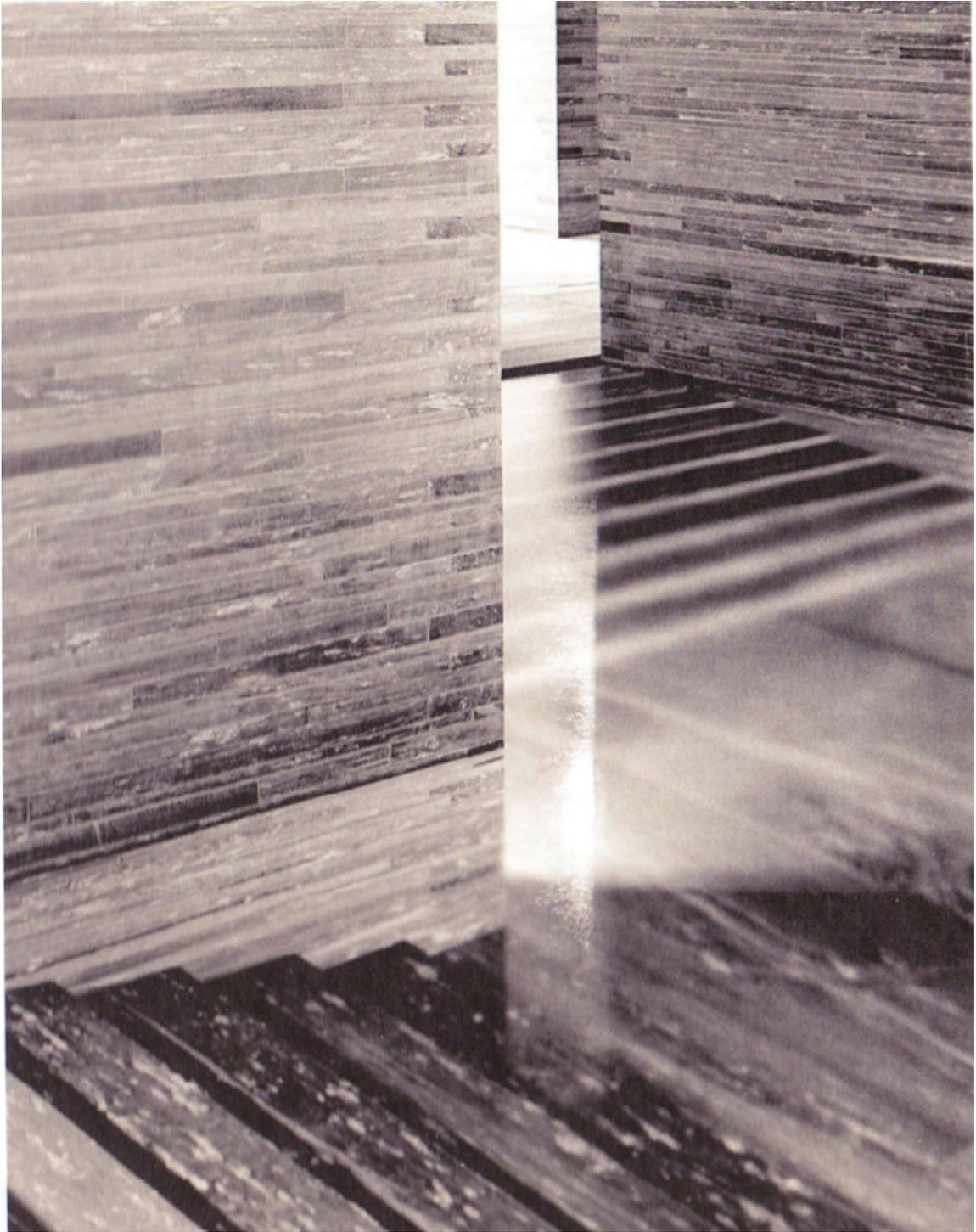


Fig. 13 - Thérme Vals Interior by Peter Zumthor



Fig. 14 Palais Idéal by Ferdinand Cheval

Stone is a naturally generating structural entity, displaying its potential in many forms across the earth. It is morphed, moved and manipulated by the earth itself alongside the human hand into unique forms of architecture. We see this in escarpments, quarries, dykes, mountains, and plateaus, where nature reflects human architecture, and where human interventions mimic nature. This form of architecture operates on its own, a non-conscious architecture. We can once again return to Gianni Pettena's 1970s documentation and artworks performed in the western United States of America to emphasize this idea. His documentation of Monument Valley's wind-formed architecture paired with that of indigenous people's houses highlights this idea (Fig. 15). There is an inherent potential of stone as a structural material, one that is beautifully seen in gothic cathedrals, mosques, renaissance architecture and many other past movements, but does not seem to be seen as much in contemporary architecture. Although stone structure is mostly addressed in restoration projects, its potential in new buildings has begun to be championed by some European Architects like Gilles Perraudin in France. He emphasizes utilizing the material for the structure of his buildings in a cooperative relationship with the quarry and its workers, shown clearly in projects like his Cave des Aurelles in Nizas and Logements Sociaux Collectifs (Fig. 16).

Stone has a long history as a building material, and as an architectural product. In contemporary architecture we see it primarily in use as a rain screen, and as a structural element it appears primarily in historic buildings and neighborhoods. In the panel discussion on structural stone put on by The Building Centre, a London based institution focused on study of the built environment, Edinburgh's historic center is brought up as an important example where all the building's stone derives from a single quarry¹¹. This panel and the exhibition that ran in conjunction discusses recent research into its sustainable attributes and structural potential, stone is a potential alternative to steel or concrete structural systems. At its core, stone is a natural and sustainable material, one that is an almost unlimited and renewable resource. According to Perraudin, using stone is a method to re-use material generated by the earth, utilizing its natural waste and its natural architectural potential¹². Perraudin believes in a spiritual approach to stone, alongside its potential as a sustainable

material. Compared to that of concrete and steel employed in the same structural manner, stone drastically decreases the embodied carbon of a building. Research by consultancy offices such as Group Work, Eight Associates, and Jackson Coles for The Building Centre in London shows that, in certain situations, a 30 storey stone building could decrease embodied carbon by 95% of the same building done with concrete or steel¹³. Although this research is theoretical with few examples of large-scale stone buildings, the sustainable potential of stone is promising. Buildings are beginning to follow this trajectory, such as works by Amin Taha's 15 Clerkenwell Close (Fig. 17-18) and Studio Lada's Office du Tourisme à Plainfaing. Perraudin states that the relationship between the architect and the quarry is key to the process of making stone architecture successful. He says, "Talk with the quarrymen. They are often passionate men who love their work. listen to them"¹⁴. The potential of structural stone is lost and is contained in the stone itself and those who work with the material intimately. Perraudin explains that in most cases, a quarry's method of "producing and developing the product is not suited" for a project intended for structural stone¹⁵. Another other issue with implementing stone as a structural material is the higher cost in comparison to options like steel and concrete. Architects Carl Fredrik Svenstedt, Gilles Perraudin and Christophe Aubertin all mention this being an issue with some of their completed projects but also note that looking at cost in terms of its lifecycle. The benefits of using stone can heavily outweigh the initial cost benefits offered with similar options in concrete or steel. Once again, they also mention that the current quarry industry is not equipped to support these projects except in direct collaboration and through custom processes, which directly affects a project's cost.

Through these three topics, covering stone's forgotten possibilities highlights its need for a re-engagement with the material. Through precedents mentioned through the sections we can see how artists and architects have holistically engaged with the material beyond its face value as an architectural product. These attributes and examples propose stone as an inspiring material to work with in an architectural framework. These projects show us a global view into the ways in which stone can be utilized, but to further this essay and focus in on stone aura, we need to address it locally as Zumthor did with *Therme Vals*.

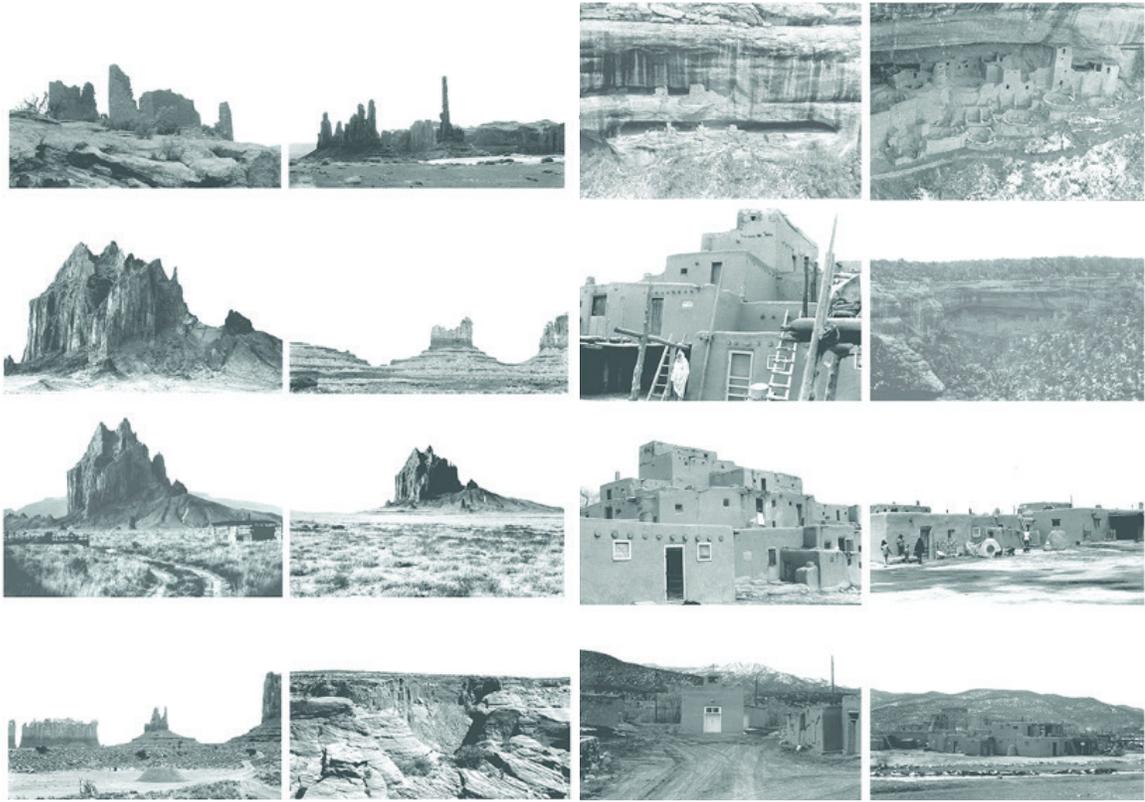


Fig. 15 - Non-Conscious architecture documentation by Gianni Pettena



Fig. 16 - Logements Sociaux Collectifs by Gilles Perraudin, a structural stone 3 story housing project in France.

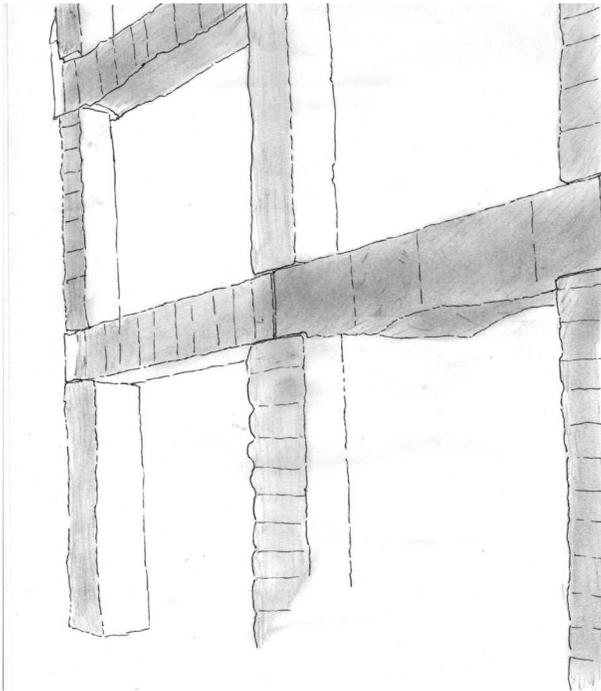
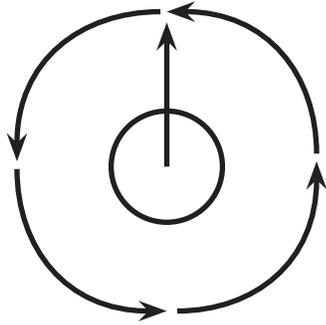


Fig. 17 - 15 Clerkenwell Close by Amin Taha/Groupwork, A mix-use six story structural stone building in London UK.

Fig. 18 - Drawing Study of the natural limestone used in 15 Clerkenwell Close



“In order to build, we mine. Therefore, we work on at least two sites: the place of sourcing our raw material and the place of building construction. All places in between, where the material is worked on and transformed, could be considered as sites as well.”

Anne Holtrop

Stone is inherently a local material, and its source is an inseparable element of its constitution. To know stone, it is essential to understand where it is taken from, and how it is cut, manipulated and used. To know where it comes from is to know its history and to know how the human hand utilizes it is to know its potential, its present, its future. Stone’s trace time, they imprint their handling, they read the earth. When stone is used in architecture, we need to acknowledge not only the site of the project but also where the material comes from and the land in between to embrace it fully as a material. It is important to do so to be able to understand the stone’s entire ecosystem, its place in the world and the elements that it touches. As I am located in Tiohti:áke, also known as Montréal, it is essential to understand the island’s relationship with stone. Montréal’s connection with stone and quarrying is evident throughout and beneath the city, starting 450 million years ago with the earth forming the sedimentary ‘grey limestone’ synonymous with Montréal’s historic buildings.

I developed an atlas of Montreal stone in order to collect and process information, and to serve as a tool for analysis. Taking inspiration from Theo Deutinger’s book *Handbook of Tyranny*, rendering data, information and ideas through illustrations and graphic representations can provide us with insights not otherwise available through descriptive text. In the introduction to his book, Deutinger explains how through the medium of an atlas or handbook, the illustrations help the reader grasp an overview and the essential details¹⁶. In the case of his book, he highlights the spatial implications of atrocities of tyranny around the world. As Anne Holtrop idealizes and Zumthor employs in his *Therme Vals*, it is essential to link the urban context, the building, the quarry and the geology with its rock formations as sites with the same material presence. This atlas of stone seeks to provide a macro view of geology on the island of the mountain alongside a micro view of the material and ephemeral details held in Montréal’s stone.

The first section of the Atlas project focuses on the history of stone quarrying and the geological formations that run through the island of Tiohti:áke. It is important to note what type of stone exists and what and how it was removed. Historically quarrying on the island was primarily a two-part industry. The first was the production of dimensioned building stone primarily quarried in the Mile-end and Rosemont–La Petite-Patrie neighbourhoods as well as on the island of Laval, also known as Île Jésus. The second industry was the production of lime and gravel, which continued on the island until the late 1980s in areas like Hochelaga. Tracing these geologic and industrial strata gives us a macro level of knowledge of the construction of the earth that Montreal lies upon, as well as the first cuts and manipulations of this landscape. It is important to know what we stand on, who has manipulated it and how they have done so.

Traces of these quarries and their impact on this city are present not only in the buildings that still stand in the Old Port quarter, but also in the infrastructure of the city, specifically la Rue Carriere, that winds and curves through the otherwise rigid grid of streets. This road serviced what was known as the Mile-End group of quarries, the largest producer of dimensioned stone within the bounds of the city¹⁷. Like the rest of the quarries on the island and surrounding communities by the first world war any that remained switched from dimensioned stone to crushed stone. The island of Montreal is made up of layers of limestone from the Trenton formation, the Chazy formation and the Black River formation. A vein of the Black river and its limestone on the island winds through the Plateau neighborhood towards villeray through the mile-end group. This vein lies between two faults which presents quarries to access Trenton, Chazy and the Black River formations from various depths in the excavations of the quarry¹⁸.

Tracing these formations, cutting out the extracted geography and mapping this data across the island gives us insight to a world that exists at a different pace and life to ours, peeking its head and allowing us to take a small piece of it before it takes its million year action of disappearing (Fig. 19).

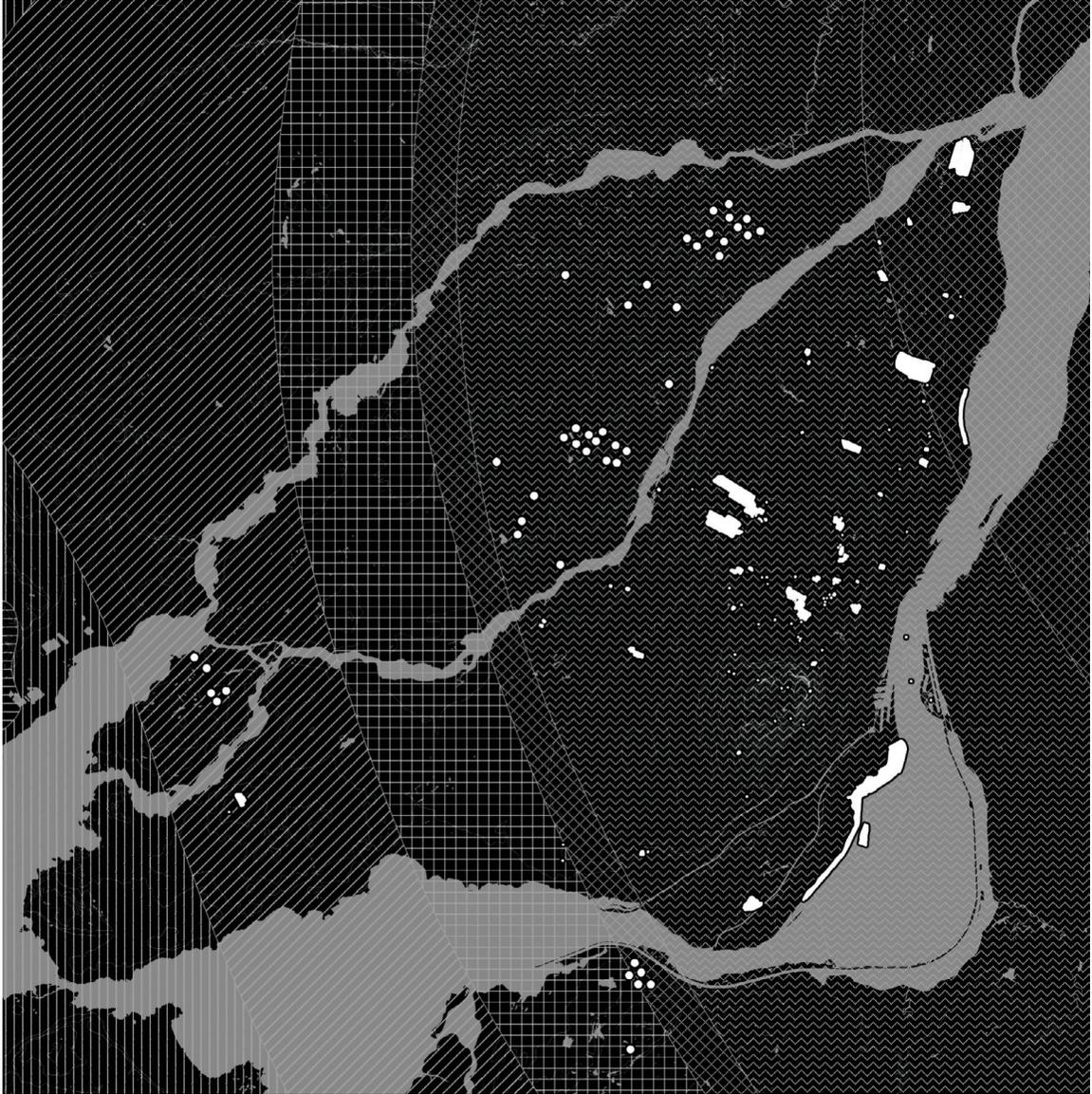


Fig. 19 - Mapping Montréal's geology, understanding the formations that run beneath my feet, and the makeup of each one. As well as their connections to industry and quarrying on the island. This map shows the formations in bands running through the island and underneath the rivers. Removed from the land masses in white are the quarries.

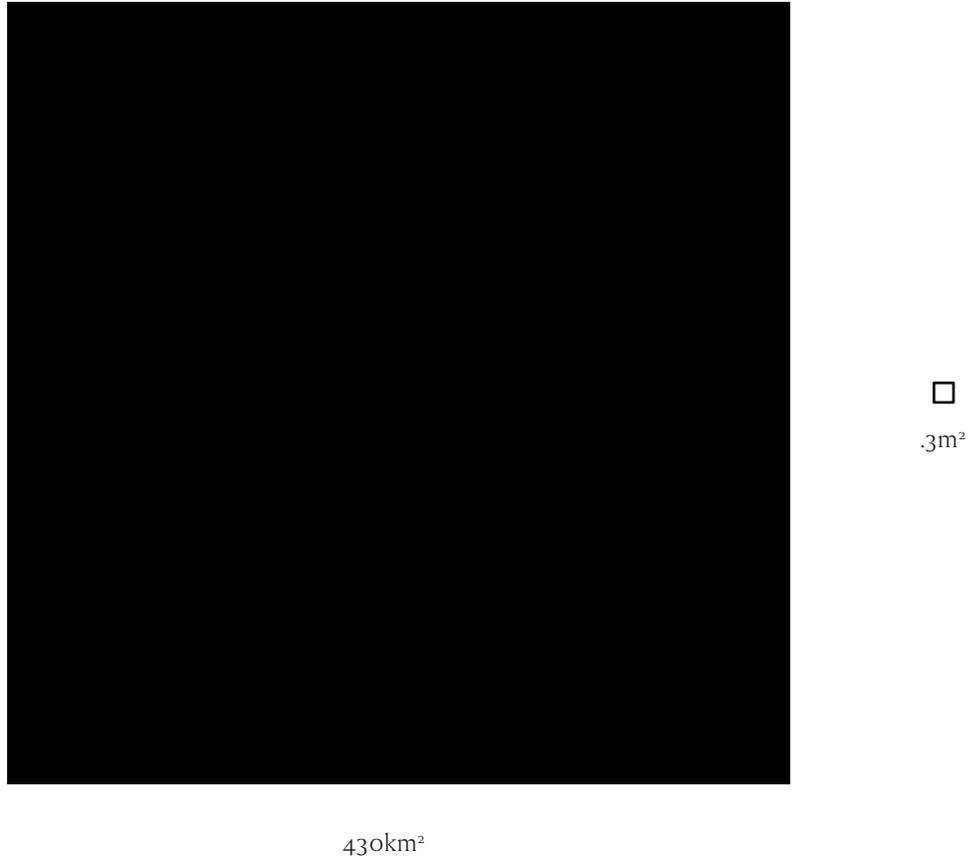


Fig. 20 - Comparison of the Area of the Island of Montréal and the historical records of area quarried on the island

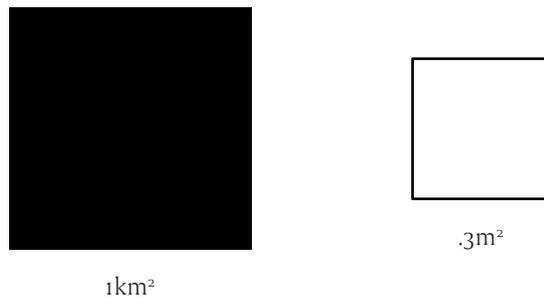


Fig. 21 - Comparison of the Area of Vieux Montréal and the historical records of area quarried on the island

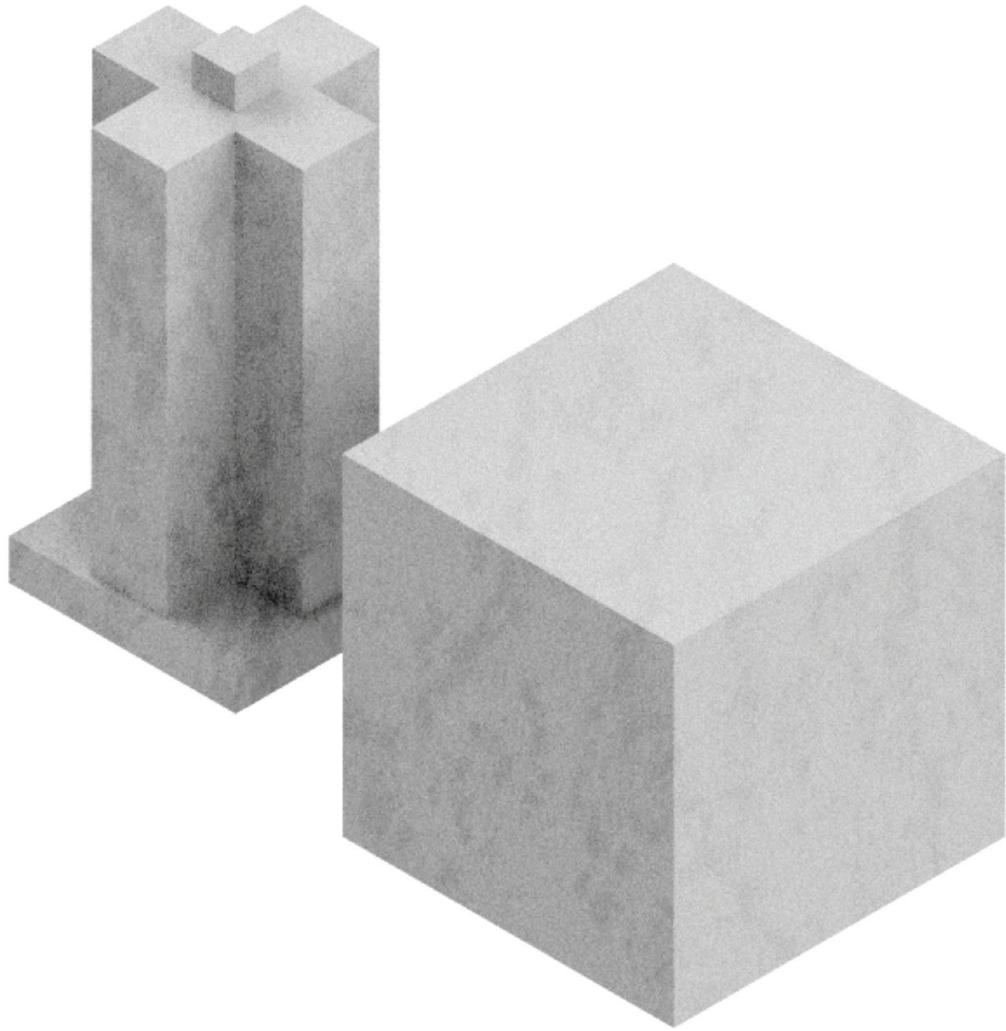


Fig. 22 - Comparison of the Place Ville Marie and the estimated and averaged volume of stone quarried on the island of Montréal

| | | | | | |
|---|---|---|---|---|--|
|  | C10 - 395m ² Chazy Formation Fossilized Grey Limestone <i>Adenai St-Denis</i> |  | C20 Trenton Formation Limestone, syenite <i>Carriere de la Stinson Reeb Bullder Supply Company</i> |  | C27 N/A N/A <i>Ollvier Limoges</i> |
|  | C11 - 12375m ² Chazy Formation Crystalline Limestone <i>United Stone Products Ltd Incorporated, JR Polls</i> |  | C21 N/A N/A N/A |  | C29 Mile-End Formation, Chazy Formation Leray Limestone, Lowville Lime- stone <i>La Montreal Quarry</i> |
|  | C14 - 590m ² N/A N/A N/A |  | C22 Chazy Formation Limestone <i>H. Cousineau, la compagnie des chemins de fer nationaux du canada, lapointe, demers et laframboise, RT Smith et com- pagnie</i> |  | C30 N/A Calcaire Batard, Calcaire Gris, pierre pesante <i>Carriere Martineau, O. Martineau et Fils</i> |
|  | C16 - 1850m ² N/A N/A N/A |  | C23 Chazy Formation Limestone <i>E. Lecavaller, St-Laurent et la Municipalite de Montreal, Jos. Lagace, Paul Chartrand, G. Cler- mont et E. Bergeron.</i> |  | C31 Trenton Formation "Banc Rouge" Limestone <i>Le Groupe De Lorimier, Keegan et Dillon</i> |
|  | C17 - 6600m ² N/A Gabbro, limestone, dark dyke rock, nepheline syenite. <i>Breches de la Carriere de la Cor- poration a Montréal</i> |  | C24 N/A N/A N/A |  | C32 Trenton Formation roche volcanique tinguite, Lime- stone <i>Le Groupe de Lorimier, Morrison Quarry Co., O. Martineau et Fils</i> |
|  | C18 - 1095m ² N/A N/A N/A |  | C25 Chazy Formation, Black River Formation Calcaire magnesien, calcaire calcique <i>Institut des Sourds-Muets</i> |  | C33 N/A N/A N/A |
|  | C19 - 1035m ² N/A N/A N/A |  | C26 N/A N/A <i>Carriere St.Urbain/Beaubien</i> |  | C34 N/A N/A <i>Le Groupe de Lorimier, Morrison Quarry Co., O. Martineau et Fils opérateurs</i> |

Fig. 23 - A sample of catalogued quarries on the island of Montréal using historic documents provided by the Government of Quebec. Upwards of 150 are recorded.



Fig. 24 - Sketch of Francon quarry, a crushed limestone quarry in operation until the 1980's

Fig. 25 - Illustration of the Francon quarry rock face

“The act of cutting and taming stone is one of intimacy and violence”

Pierre Bidaud

Dressing is the act or process of surfacing and shaping blocks of stone and is often broken into various steps; sizing, shaping, planing, finishing and polishing. In a more ephemeral and philosophical manner it is a craft requiring “love and immersion” and allowing all five of your sense to develop over years¹⁹. This relationship is one that acts in both directions, the stone pushes back on you as you cut it, dulling your tools and muscles. Stonemasons are intimately aware of stone, the material as a sacred object. In conjunction quarrymaster they work hand in hand following the stone’s natural flow cutting where it asks, feeling its push or pull. This relationship holds knowledge beyond the postmodernist victims of rainscreen cladding as Pierre Bidaud states in his personal essay on stone²⁰.

With Bidaud’s idea in mind, in the atlas it is important to investigate dressing and masonry, both as a whole and locally. Through aggregation of methods and styles of dressing I can see the possibilities and visions of stone. Retracing and visualizing the tools helps to engage with a very tactile process. In local action, the production of photographic details and rubbings are a method to engage with the dressing process on a more intimate level (Fig. 26-27). Getting close to the stone to see all the micro patterns and veins, and feeling and touching the stones through the rubbings. This process does not align me directly with what it means to dress stone, but it assists with understanding the intimate nature of working with stone, the small details only a stonemason or quarrymaster understand.



Fig. 26 - A collection of cut stone details, exploring different stone and different methods.

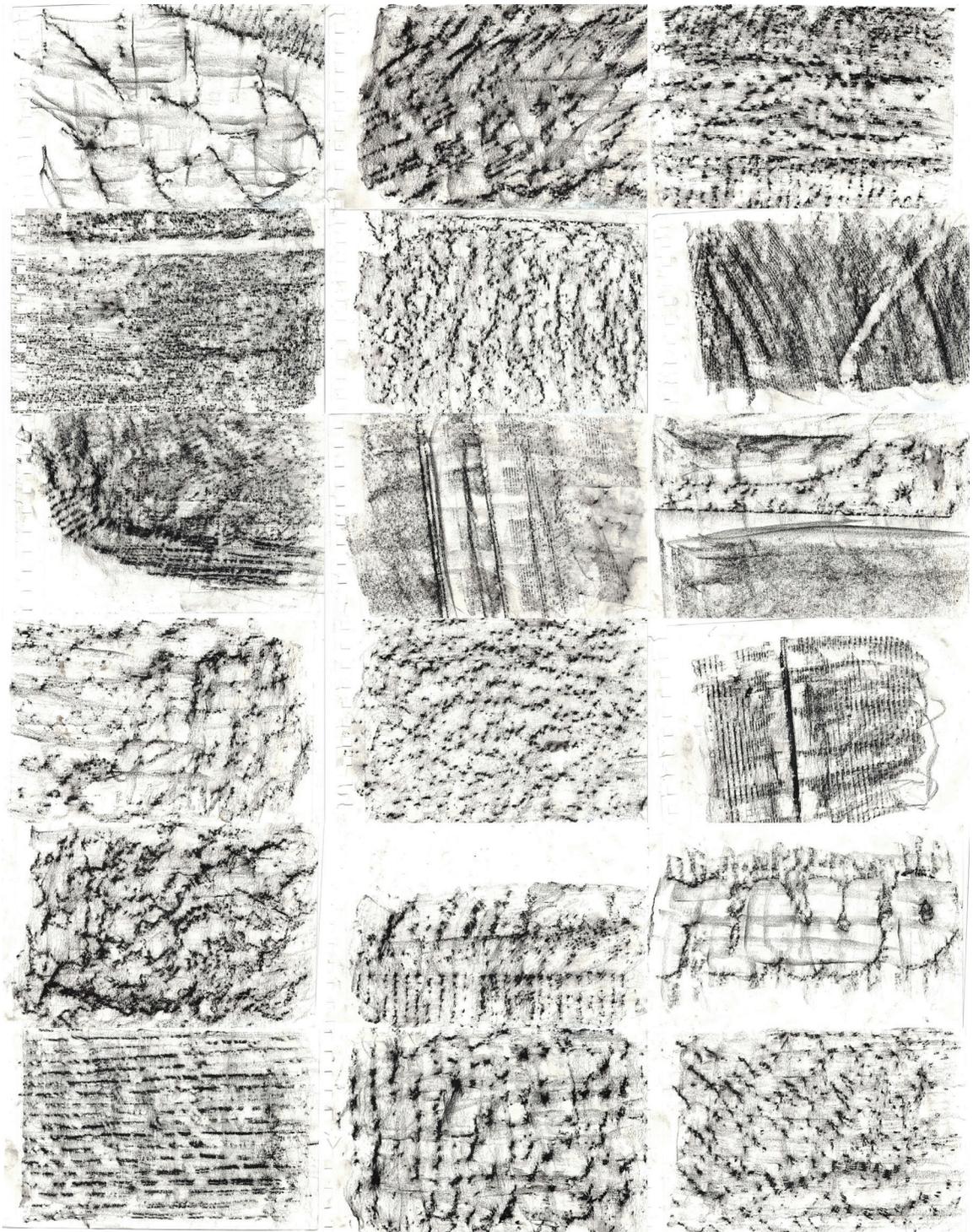
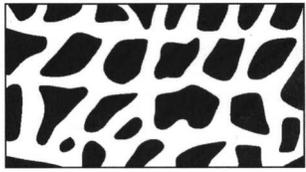
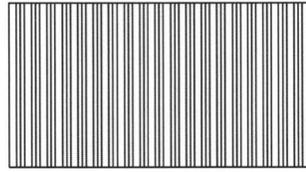


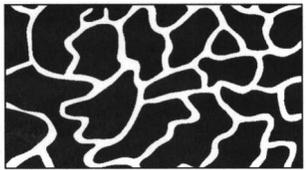
Fig. 27 - A collection of stone rubbings, exploring different stone and different cutting methods.



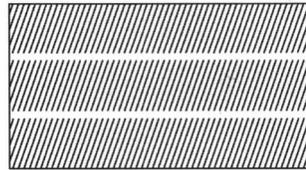
Reticulated finish



Furrowed Dressing



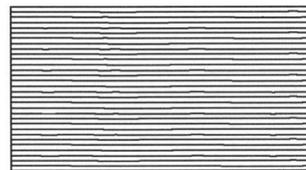
Vermiculated finish



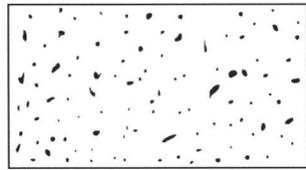
Boasted or Droved finish



Pitched dressing



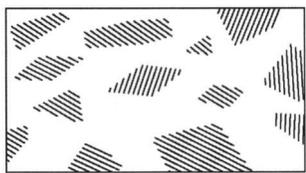
Rough Tooling



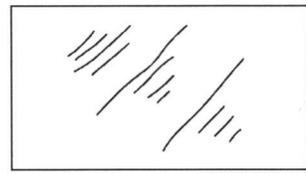
Picked Dressing



Sawn Dressing:



Hammer dressing:



Polished Surfaces:



Combed finish



Fig. 28 - Categorization and Illustration of the historic methods of dressing stone.

“In their durability, stone monuments assume and entrench unchanging values, both moral and aesthetic”

Arianne Shahvisi

It would be remiss not to mention the old quarter of Montréal, generally known as the Vieux-Port, in a survey of stone in Montréal. A district full of stone buildings constructed across a couple of centuries, showing a gamut of different approaches to using stone, from early fieldstone buildings to contemporary grey stone condo buildings. The area is the site of the original settlement of the french colonialists in the late 17th century, at the time under the name of Ville-Marie²¹. The area is littered with buildings and ruins dating from this era through to the 20th century when stone buildings started to become more expensive to construct. Buildings like the Pointe-à-Callière and Marguerite Bourgeoys museums allow public access to see these first stone building foundations, both situated underneath stone buildings built on top of them in a later century²². What is important to note is that this is the history that remains through stone, but that in fact there are traces that pre-date that of the colonial settlement. Archeological investigations show the presence of the indigineous people, the iroquois nation, on the land dating back 4000 years²³. It is important to note this history, that the stone ruins and architecture that remains is just a small part of the story of the area. The use of stone in a manner obstructs a full history, acting as an impenetrable, unchanging, conservative force.

In the atlas the act of tracing these different periods of history in the Vieux-Port allows us to see what remains and what has morphed, changed, resisted. This process shows stone in architecture being used to solidify a position and claim on land. The stone, whether standing or in rubble highlights a specific history and context of the area, in the case of the Vieux-Port it is that of French colonialism and the settling of Canada.

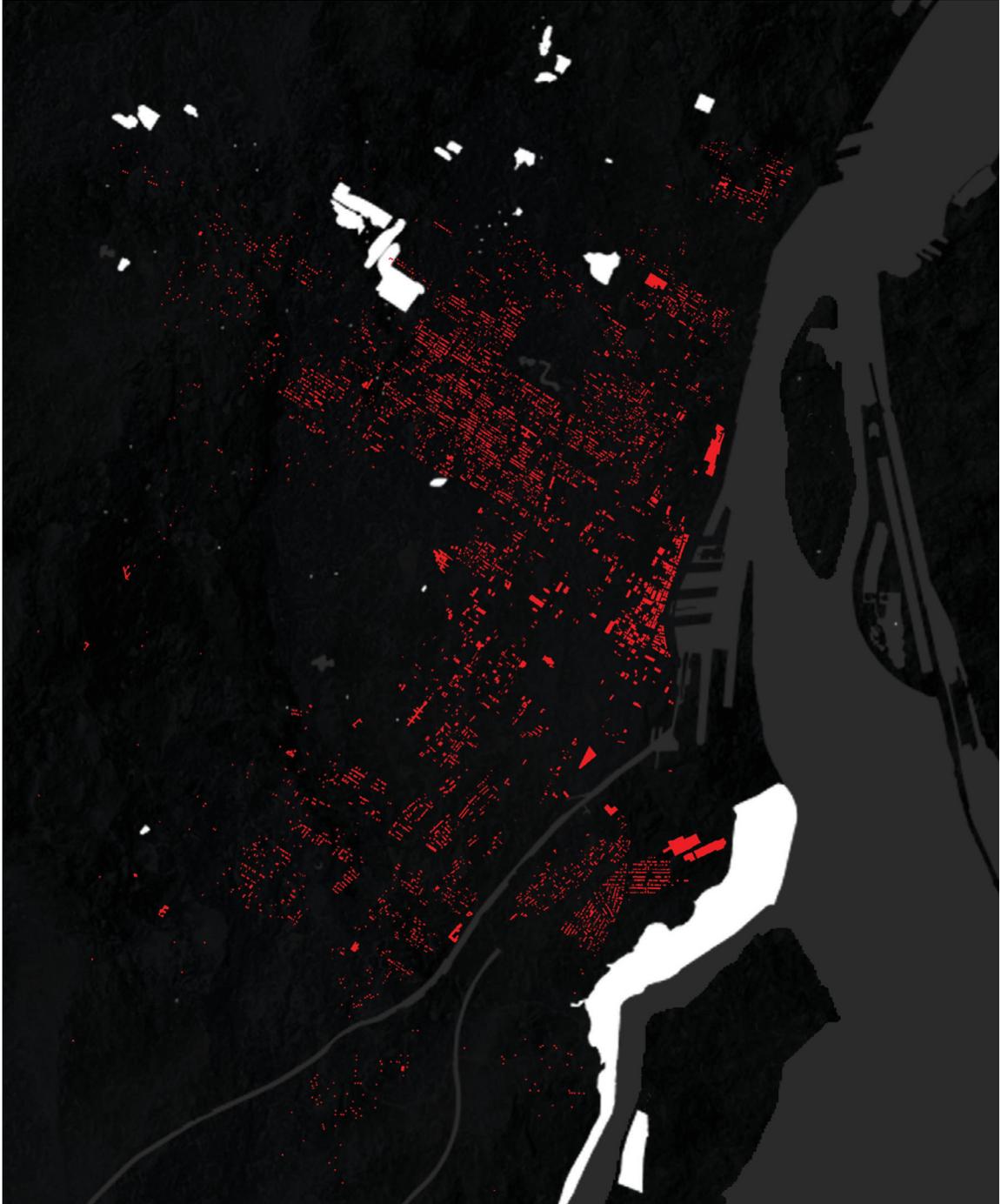


Fig. 29 - Mapping exercise to observe the relationship of quarries (in white) to that of buildings in contemporary Montréal built prior to 1900 (in red)



Fig. 30 - Mapping exercise to compare buildings constructed prior to 1900 (in red) and buildings built after 1900 (in grey)

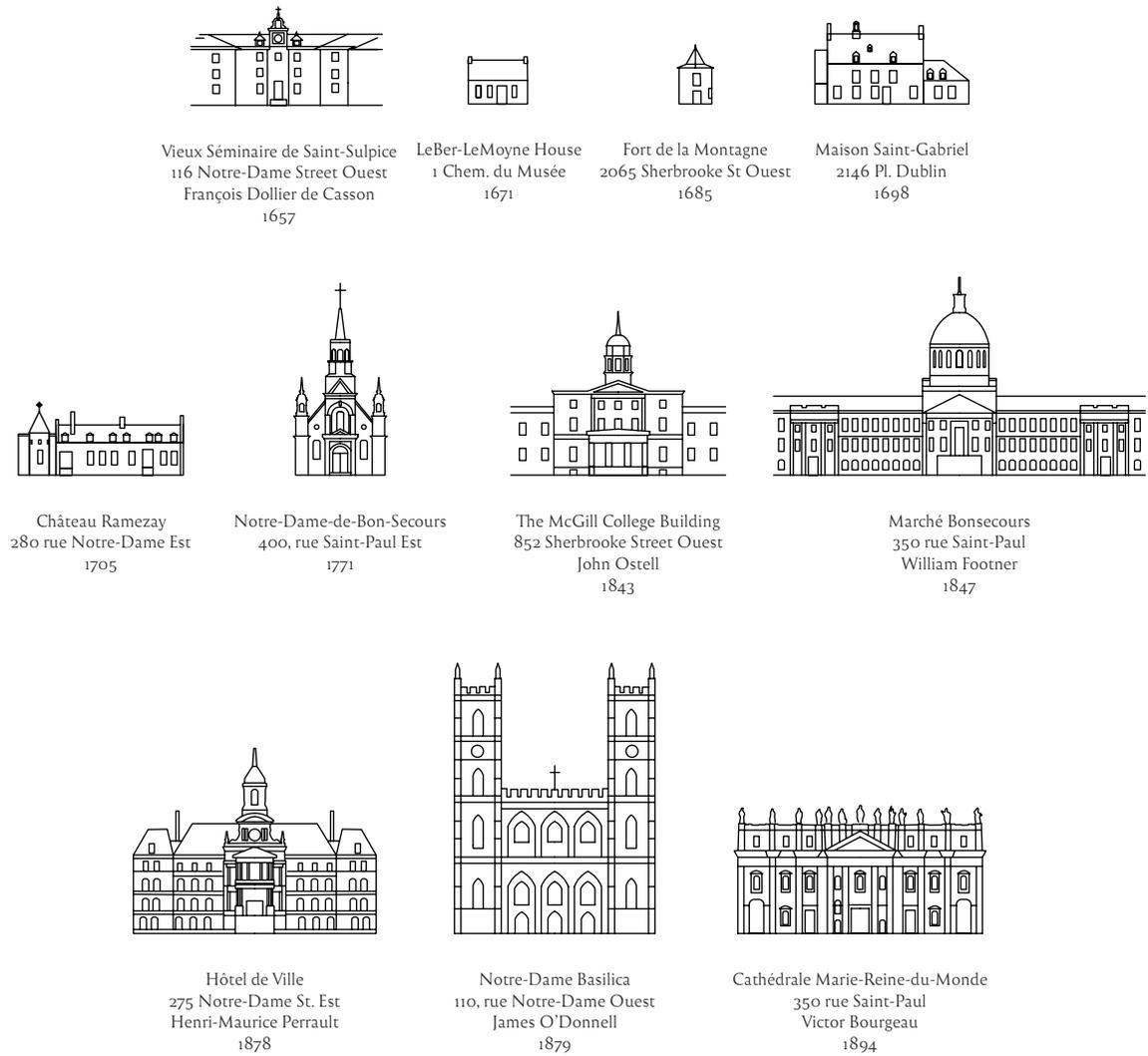


Fig. 31 - Illustrations of notable historic stone buildings in Montréal



Fig. 32 - Illustrations of Lime Kilns in the Plateau neighbourhood of Montréal
Fig. 33 - Illustration of Lime Kiln interior

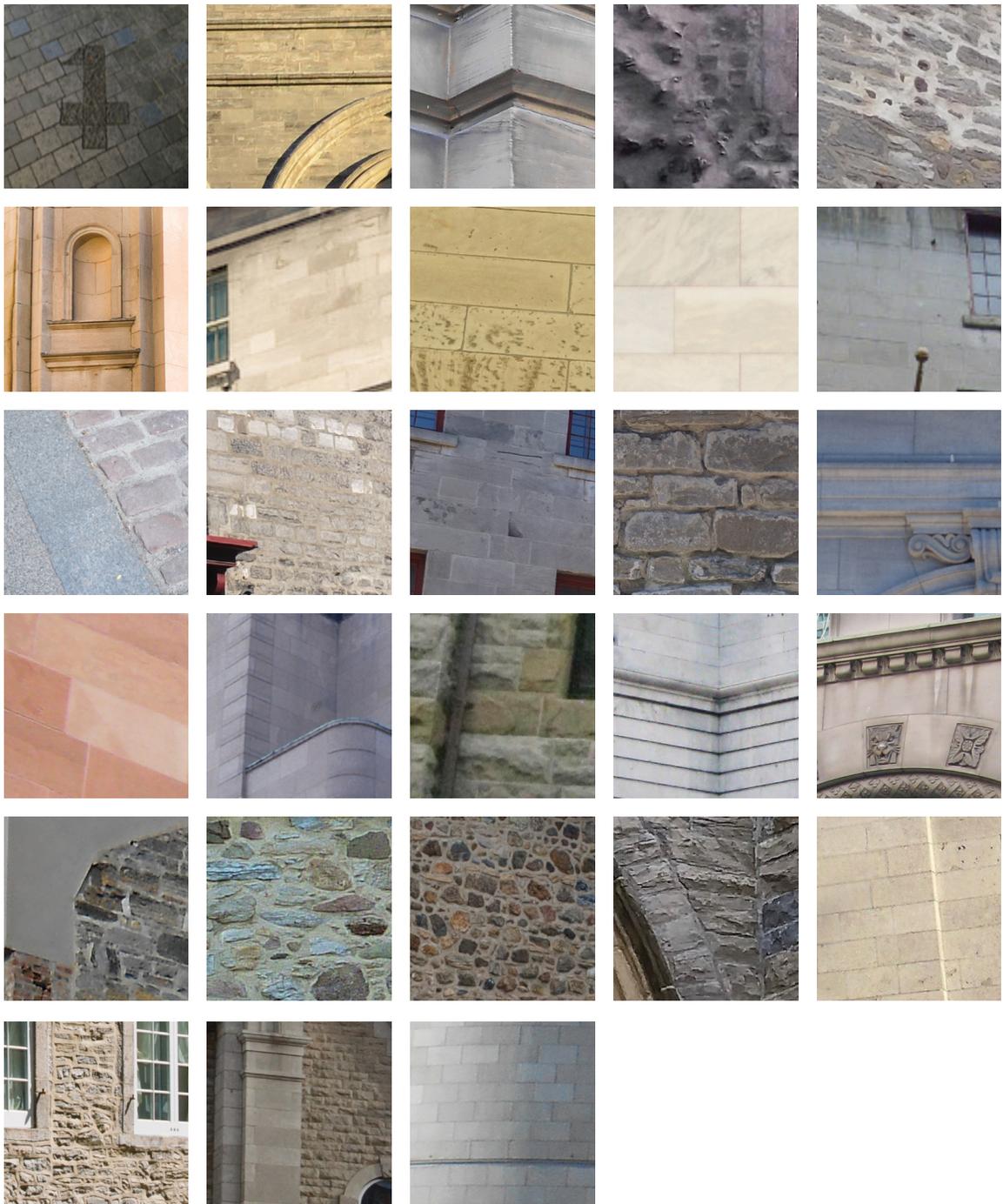


Fig. 34 - Selected details of stonework found throughout Montréal ranging from the 1650s to 2010s.

“Conceiving a building as a dialogue between a monument and a ruin intensifies the already blurred relations between the unfinished and the ruined and envisages the past, the present and the future in a single architecture”
- Jonathan Hill

In 2021 PHI in Montréal announced an international architectural competition for the design of PHI Contemporary, a cultural institution to “consolidate, extend and intersect” the institution’s pre-existing community, cultural production and public engagement into a single complex. The site for this competition is located in Montreal’s historic old-quarter like the institution’s other two pre-existing buildings. The competition brief asks for a fuller engagement with the local environment. As such, it is impossible to ignore the stone architecture on the site. The program requests an extensive list of facilities: studios, galleries and performance spaces. The final, selected design will be a complex artistic facility with the ability to embrace many facets of cultural and public engagement. The brief requests an extensive list of requirements and ideas to be featured in the final design, one that requires a full-fledged studio to tackle properly. In the case for this thesis I am embracing the core elements of what is set out in the competition brief and exploring my ideas into realms beyond that of practical architecture.



Fig. 35 - Illustration of pre-existing site set for the future PHI Contemporary
Fig. 36 - Floor plan study of pre-existing site buildings



Fig. 37 - Selected documentation of site visit

PHI Contemporary's international architecture competition presents a site ripe for exploration using stone as a material component. The site asks the designer to address the pre-existing stone that exists on its site and surroundings, and the new open space allows for engagement with new stone architecture. Furthermore, it provides for addressing the historical aspects of stone, alongside new ideas and engagements. This chapter offers exploratory proposals that address the importance of working with stone, an attempt to reconnect with the material and understand where it comes from, how it behaves and what power it holds embedded in its slow moving body. These proposals seek to engage with both the core of the practical program suggested for the PHI centre and experimental ideas of architecture. My design proposal hovers between the practical/functional and the experiential/speculative. There is value in exploring non-traditional approaches to this thesis in regards to the site. As my research and work leading up to a true design element has explored many facets of stone beyond that of practical applications it is important to employ this in a design methodology. Instead of working some of the research and potency into an architectural program, these designs instead allow pieces of the program to filter into ideas of stone as much more than an architectural product.

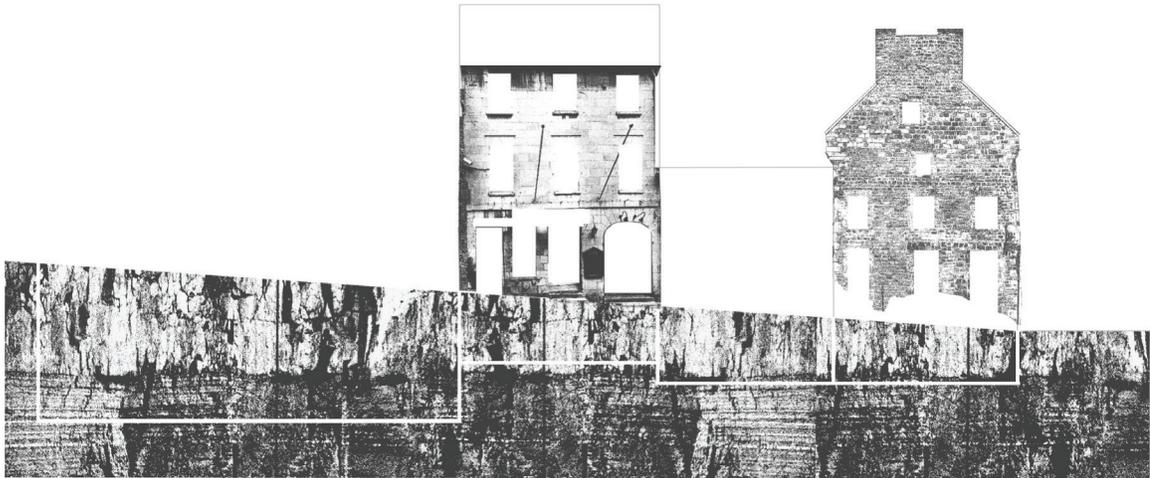


Fig. 38 - Illustration merging the stone of the island with the pre-existing buildings. Acknowledging the two elements of stone that already exist on site.

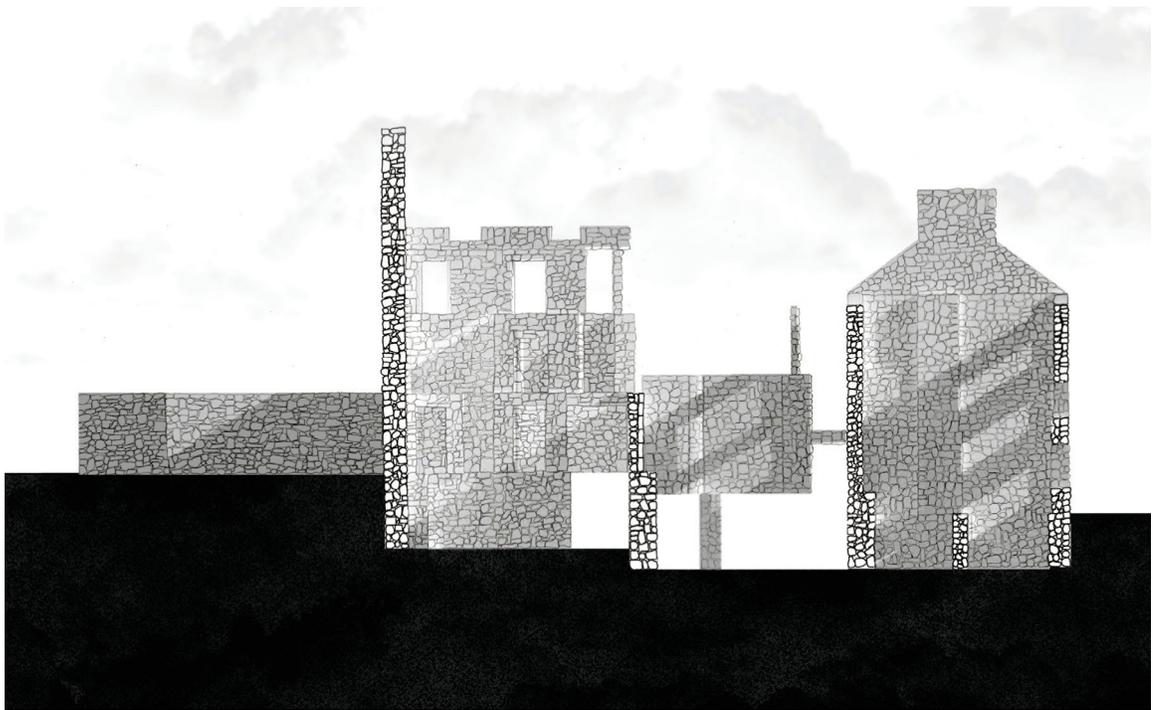


Fig. 40 - Section illustration further exploring the stone skeleton of the pre-existing site structures.

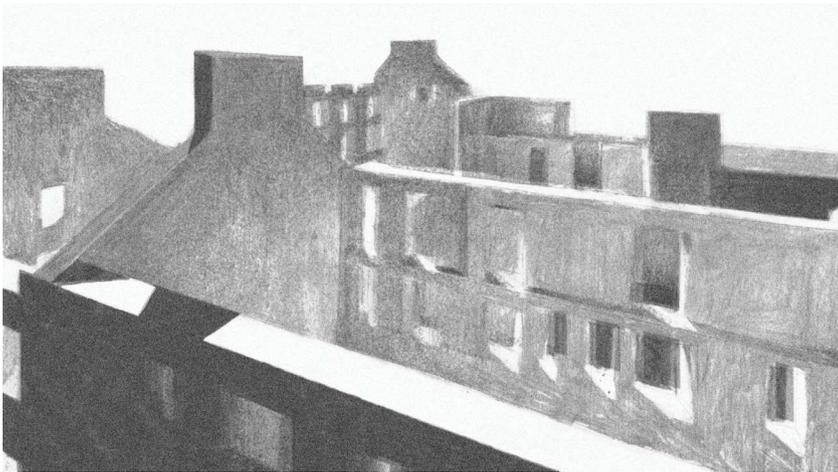
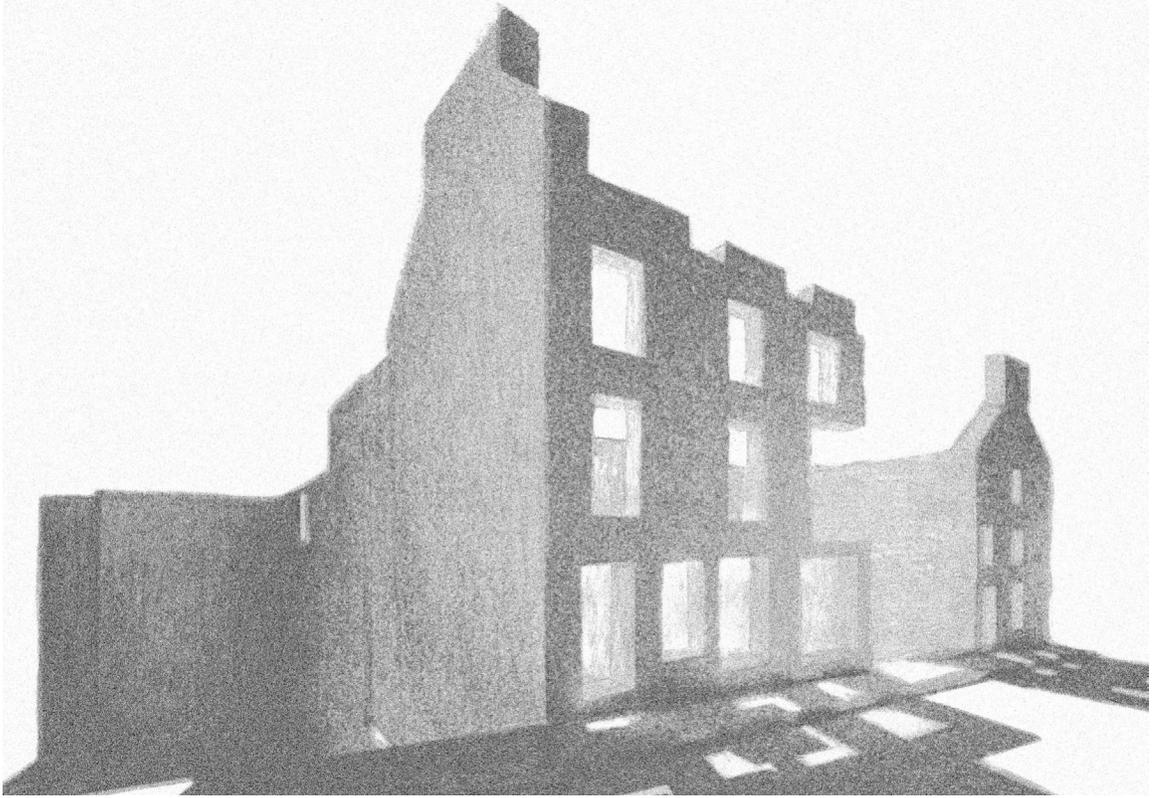


Fig. 41 & 42 - Drawings imaginaning this skeleton as a ghost or spectre, the remaining 'spirit' of the building, it's core and its stone soul.

By investigating architects engaged in artistic practices such as Walter Pichler, Robert Smithson and Gianni Pettena, we can find new methods to engage and understand our relationship with the earth, nature and stone. All three of these artist/architects practiced a radical architecture, one that could be labeled as *Anarchitectural*: a practice not against architecture but a method to propose new vantages and ideas. Marco Scotini defines this as acting at the scale of 1:1 within the site with no preconceived plan or conclusion²⁴. It is to be an Architect without Architecture. It can be seen as the inverse of architecture, the inverse of working at scale and completing a fully complete conclusion before acting. Whether in sculptural or performance form, these architectural works invite humans to engage with their environment and ask them to participate in its architecture rather than just act as works of strictly theoretical exercises or static onlookers.

Pettena is a good example of this, as part of the radical Italian architecture movement of the 60s, he sought to push the boundaries of architecture through non-traditional means. In the 70s, along with his move to the United States, his work shifted into a practice that falls under the umbrella of Anarchitecture. In his work, Tumble Weeds Catcher, Pettana allows the wind to dress a structured wooden tower in tumbleweed (Fig. 43-44). This project explores how working at a distance can transform architecture into an evolutionary process, opening it to change and the unknown. This work offers a beautiful interplay between nature and humans, where humans may manipulate nature-made, and nature manipulates the human-made. The work oscillates between worlds and shows that the earth is irreversibly, infinitely and cyclically modified.

Alongside Pettena we can take another look at Robert Smithson's work as inspiration for potential investigations and interventions. In his project titled *Non-Site*, a series of sculptures and installations, Smithson is engaging with both stone and quarrying. The installation involved extracting raw earth material from natural sites of interest, like that of slate from the Bangor quarry, and placing the material in a box frame within a gallery (Fig. 45-46). Smithson's *Non-Sites* transform the elements of a landscape and earth into the gallery, and re-package the organic and geologic time anew in the exhibition space²⁵. Unlike his

earthworks that arouse a sublime emotional state in their presence, the *Non-Site* works to remove the viewer's experience of the sublime. Smithson refers to this process as "de-architecturing", we must address the material, the earth and lithic time outside of the realm of powerful emotions that nature can induce²⁶.

The work of Assemble Studio presents a powerful, contemporary precedent. Their work operates in a temporal state, where the architecture is impermanent and sits lightly within a site to quickly engage the site and the public in the space. Their project, *Folly For a Flyover*, sited in a disused underpass, is transformed into an arts venue and public space, through simple frameworks integrated into the site's infrastructure that allows for the respective community to engage with it in their own manner (Fig. 47-48)²⁷. What is powerful with this project and other work from the studio, is the lightweight and flexible system of architecture in comparison to the heavy and full cultural impact the works have on the communities they address. There is power in providing a minimal system for actors to inhabit and fill the space with questions, art, community, play etc. In our case with stone and the PHI we aim to engage the community both artistic and touristic to become involved in the site and the material, to engage directly without having a system or institution that is too burdensome.

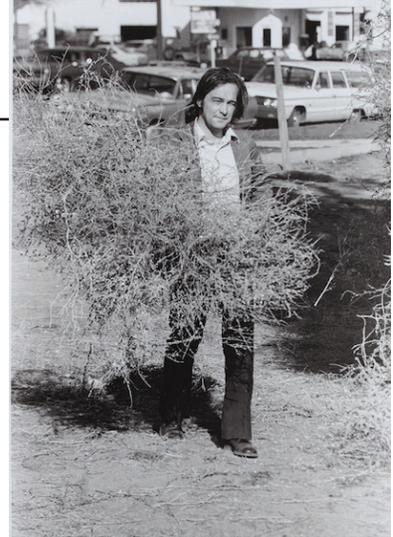


Fig. 43 & 44 - Gianni Pettena and his Tumble Weed Catcher



Fig. 45 & 46 - Robert Smithson's Non Site Installation and the artist collecting stones.



Fig. 47 & 48 - Assemble Studios project Folly for a Flyover facade and community film screening.

My approach to considering the PHI Contemporary competition is to view it as three components and propose conceptual interventions through evocative imagery rather than descriptive. These proposals and concepts do not seek to complete the requested program listed in the competition but instead act as new ways to understand the site and its roots in stone by embracing some of the core elements.

The first component is about lithic performance -exploring architectural actions like quarrying, removal and displacement, industrial context, and sonic potential - all derived from my studies of stone. This first intervention focuses on extraction and quarrying, creating an empty space and designating a ruin through manipulation of the pre-existing buildings on the site. The site would be split into two wings, where each undergoes inverse processes. First, the empty lot becomes quarried, removing the earth and stone and leaving a void. Then, the pre-existing stone buildings invert this process by excavating everything deemed non-stone, leaving a skeletal monument and ruin of the pre-existing context. The void would act as a performance hall, functional through a temporary skeletal structure similar to scaffolding. Entrance and support to this hall would be accessed through a weaving path between the ruin of the stone buildings at grade down into the earth. To explore this design and ideas, the medium and action of (digital) collage is a method that fits ideologically well with the intervention proposals. At its core, collage is a method to use predetermined material in new manners, exploring new ideas by splicing, extracting and combining material in new techniques; it is an experimental method looking **beyond**. Alongside this theoretical approach, there is a metaphor to recognize the act of quarrying and extraction in the world of stone that relates to cutting and extracting elements from images in the collage process. Leaving hard cut edges, crumbling qualities and dustiness in the images reflect this connection.

01. Action / Performance

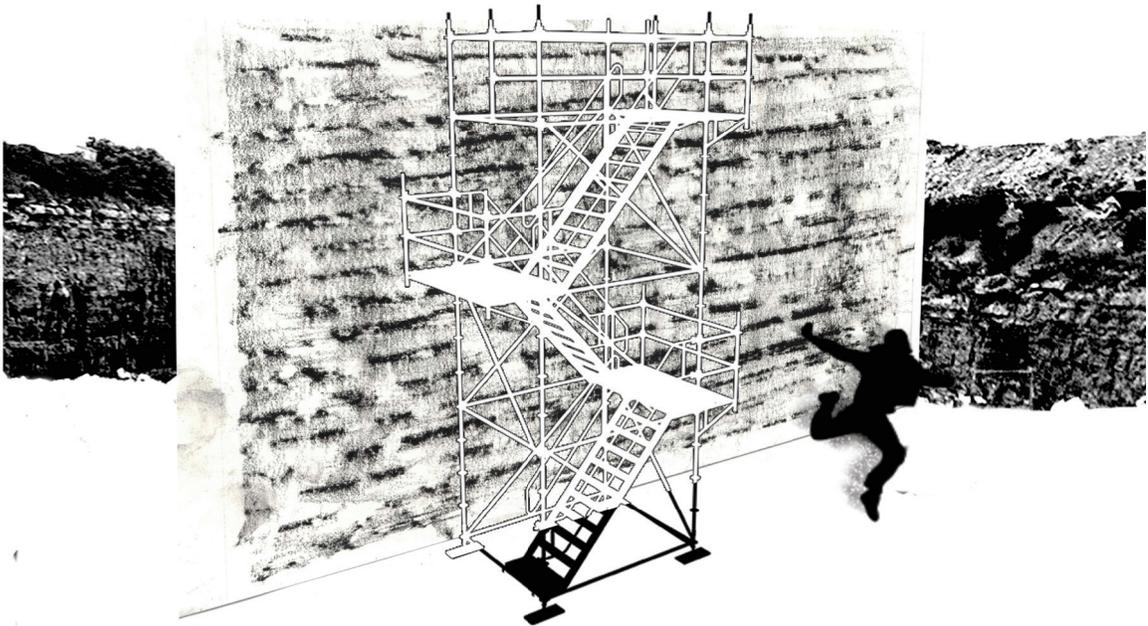


Fig. 49 - We begin with a descent into the new quarry/hall, a journey of play and performance 1:1 with the raw surface of cut stone. We dance, touch, and explore the stone as we descend into the venue, an excursion with limited restrictions.

01. Action / Performance

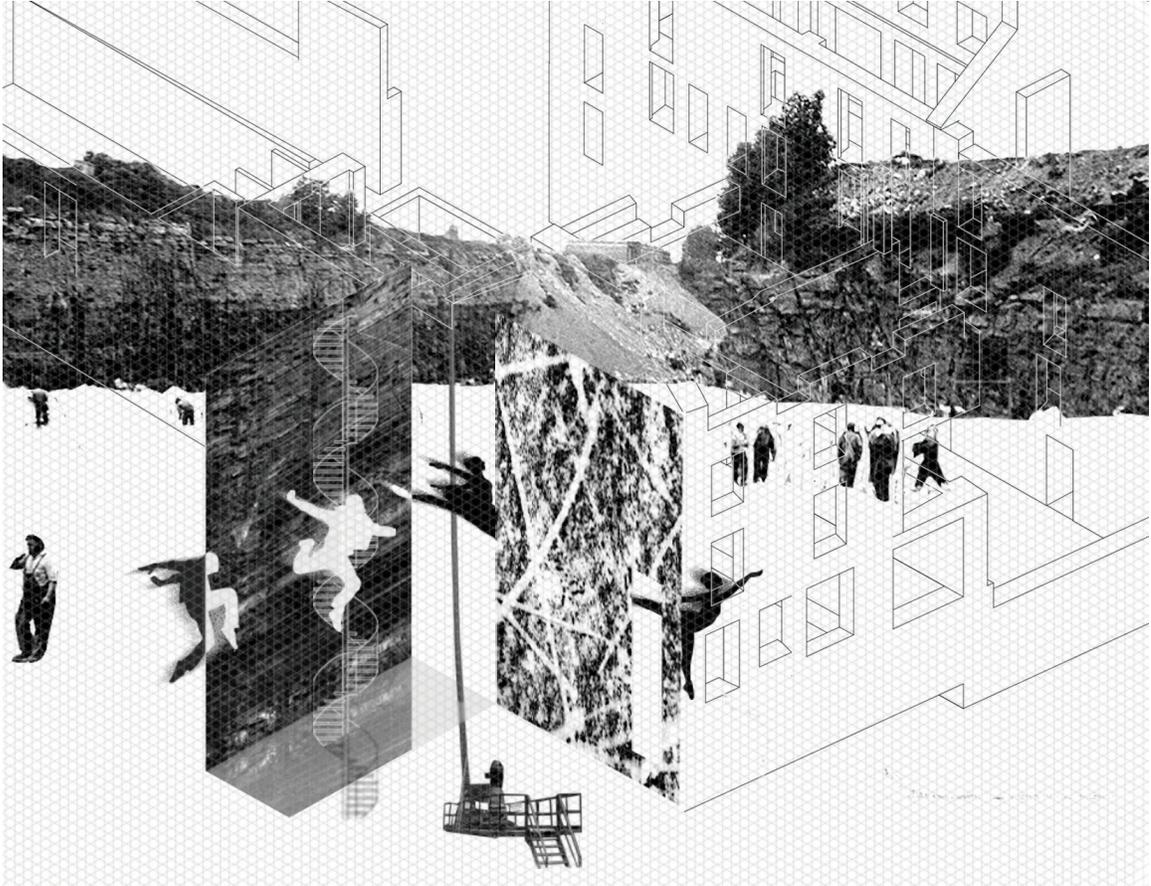


Fig. 50 - As we enter the quarry and venue, we are gifted a connection with the earth and the stone skeleton of the pre-existing builds. We are welcomed into the open stone space where simple screens, entrances and circulation are open for storytelling, dance and sonic performances. It is a low-tech space that encourages engagement through simple limitations.

01. Action / Performance

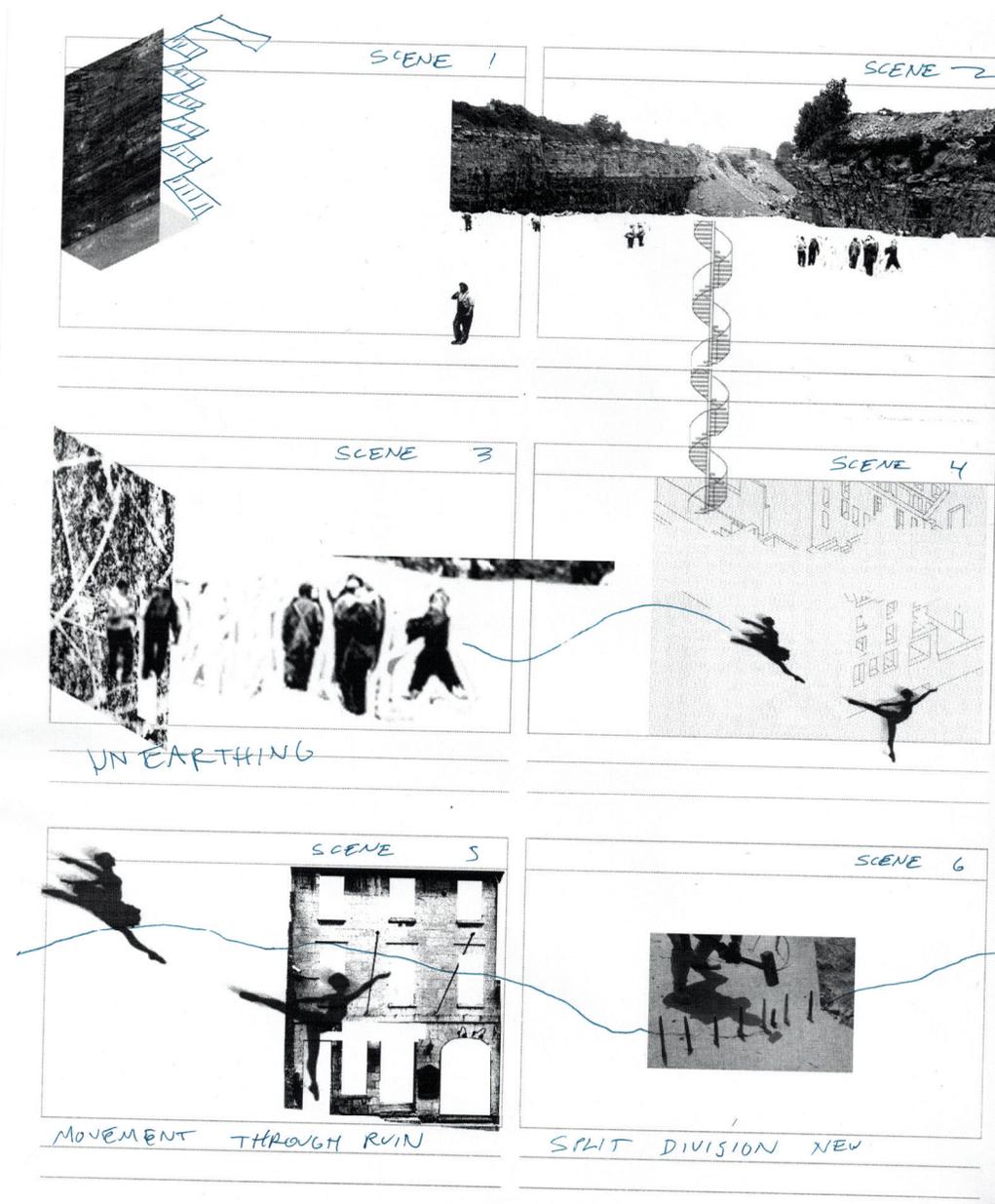
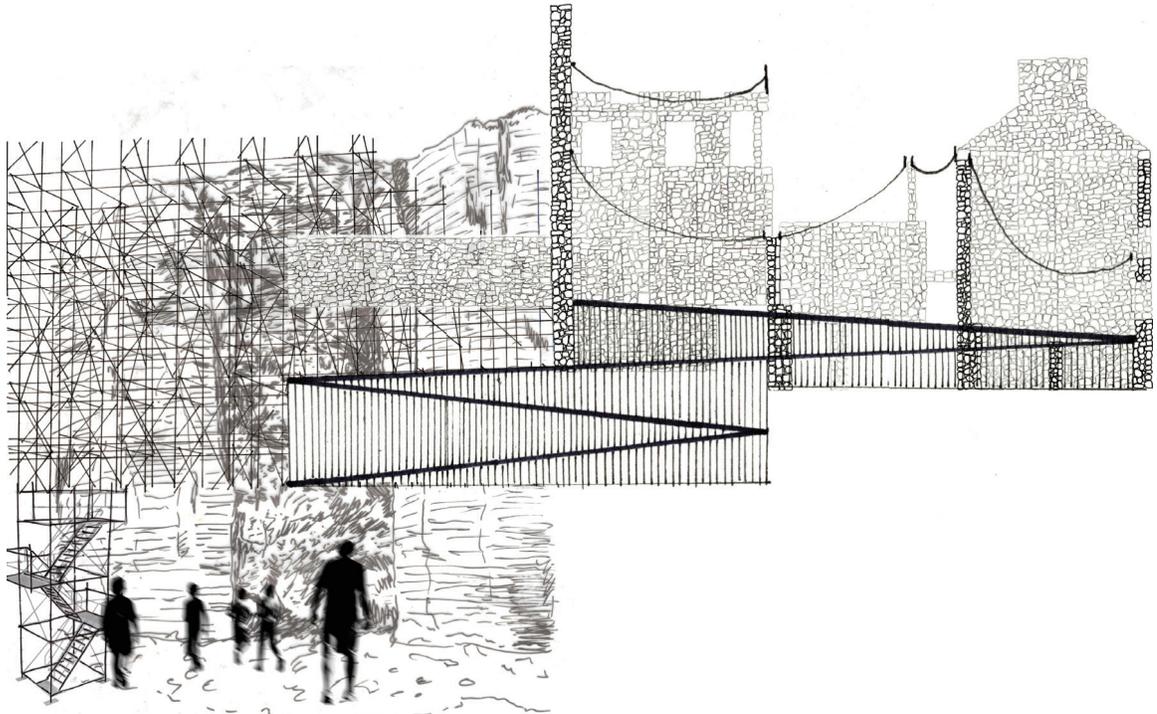


Fig. 51 - The new quarry is a blank template/sheet/storyboard to be filled in and choreographed.

01. Action / Performance



The second component is focused on addressing the cultural and colonial state of the site through insertion in the pre-existing buildings and exhibition of artwork that addresses the settler-colonial state of Montréal and the power and violence held within stone. The intervention starts with the insertion of the white red cubes between the stone walls of the french colonial-era buildings. These white red walls do not remain matte and empty like a traditional exhibition and gallery space and instead become opaque and show the stone and structure behind them. This unique space is an event and site inviting artists to directly engage with the tint of colonial structures in the context of Montréal. It also hopes to invite indigenous artists and designer-makers alongside local allies hoping to address their position in maintaining colonialist structures.

This intervention embraces the **The Settler Colonial Present** defined by Andrew Herscher and Ana María León. The idea is to acknowledge our society's valorization of settler colonialism as a historical moment in the distant past, one of appropriation, dispossession and violence legitimized as settlers have built and developed using the land, water, and life taken from indigenous peoples²⁸. In this perspective, we live in a settler-colonial present where we occupy and maintain the grounds and resources we have taken from the indigenous people²⁹. Architecture and, in turn, stone play an integral part in this history. They act both as tools to maintain the legitimacy of this present. Architecture as a signal of development and its device within systems of capital maintain its power, and stone, a material of strength and endless time, gives the ability to maintain its process long after its manipulation into architecture.

02. Insertion/Exhibition

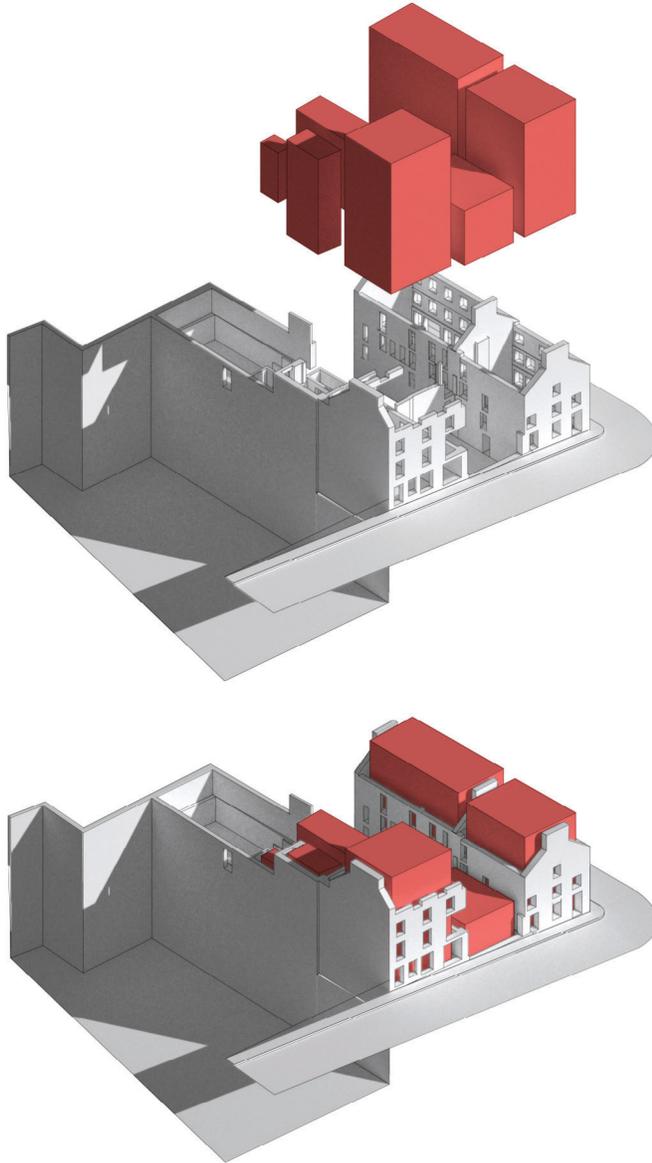


Fig. 53 - The white-red cubes float effortlessly into the voids of the stone skeleton on site.

02. Insertion/Exhibition

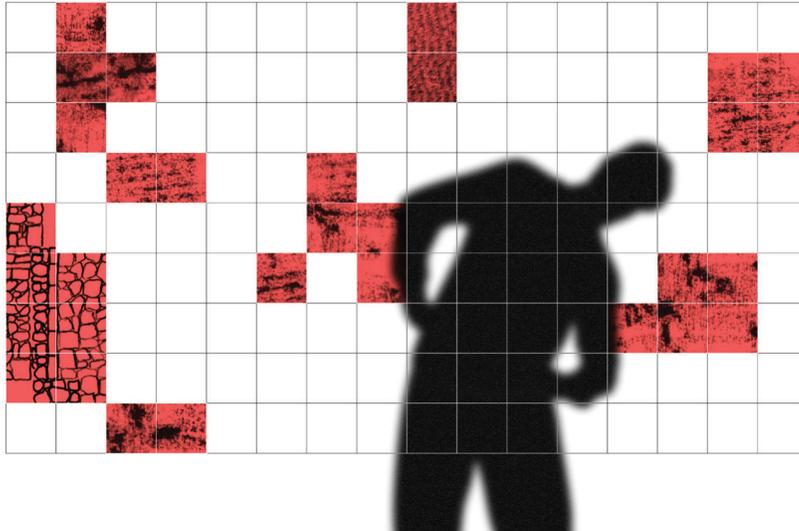


Fig. 54 & 55 - The intervention tints viewers and passersby. The light from the opaque material or their view manipulated by its colour becomes unavoidable. It is a system that does not allow for any avoidance.

02. Insertion/Exhibition



Fig. 56 - The red shroud reveals the powers of the colonial stone — the destruction of landscape through political or engineered means. The exhibition reveals the violence of our past, present and future.

In our final intervention, we look to the future and imagine a utopia/dystopia that presents education and evolution and their inverse de-education and de-evolution. The last element of the perpetual ruin defined earlier in the thesis is the future combined with the present and past. We seek to embrace stone as this ruin, one that will evolve on its own, slowly (de)evolving as it sees fit, backwards or forwards, to landscape or architecture, perhaps ending somewhere in between. Past, present, and future become landscape, architecture, & ruins. This intervention envisions a centre of lithic education, where our site has crumbled and reconstructed itself, where we can find traces of its history, functionality in its present architecture and ideas for the future. It is a site for reflection, doing and planning.

03. (de)Education/(de)Evolution



Fig. 57 - The site expands into a landscape of education and knowledge, breaking outside the Vieux Montréal to embrace a larger context of stone. It begins to act as a stone tower of babel, a refuge for its various languages.

03. (de)Education/(de)Evolution

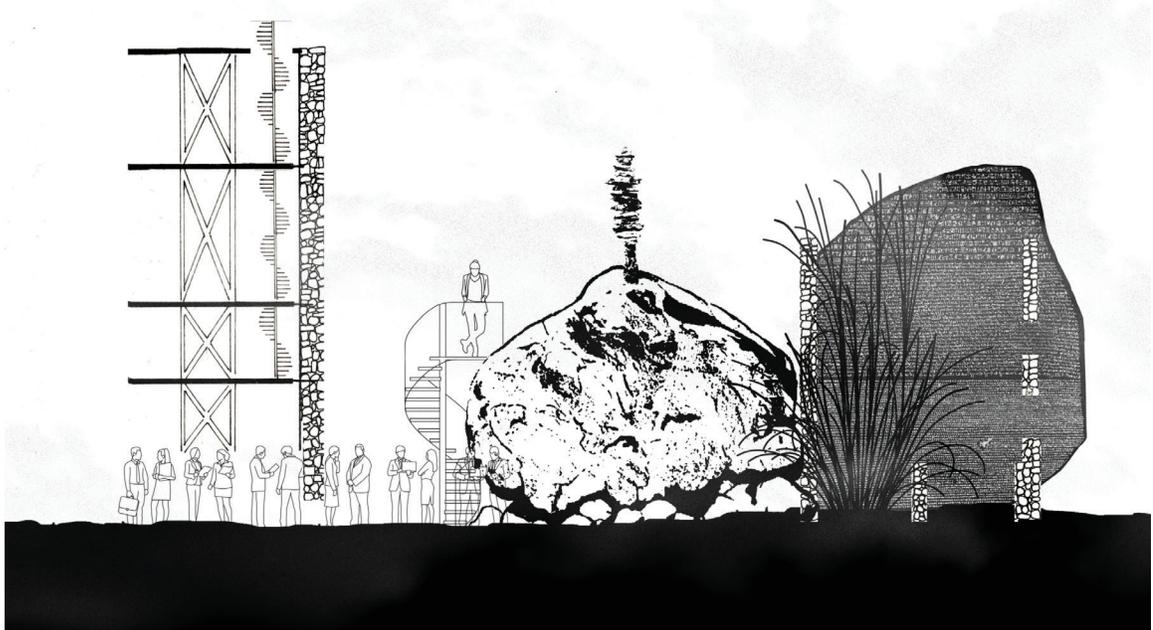


Fig. 58 - The stone develops beyond its specific past and present, blending them with a future. It blends landscape, architecture and ruins as a site of education. Stone acts as a vessel of time, and here we see it as something with no end or beginning.

Conclusion [Fifth Meditation]

The previous section of intervention proposals is a pseudo- conclusion to the thesis. The three interventions are not finished products or ideas to explain stone in detail within architecture. Instead, they act as visions into the endless depth of stone as a material. In my defence presentation, I was straightforward in mentioning that this thesis is not a complete diagnosis or contemplation of stone but one like meditation that ebbs and flows into different realms, following my personal intuition with stone. These interventions and conclusions also follow this principle. They act as potential realms for exploration, dense sketches that can be taken and embraced by others. I propose new and old methods and stone ideologies worth exploring in contemporary architecture and culture.

The ideas I present and the methods in which I do so are not simple and contain a multitude of conflicts. This is intentional; the thesis does not seek to paint or promote a utopic vision of contemporary stone and a call to return its widespread use. Instead, it is a call to engage with materials in a more holistic and diverse method. It could be applied to other materials that offer multitudes and sit complicatedly in between the human-nature relationship of the Anthropocene (and beyond)³⁰. I use stone in my thesis as it is an excellent representation of this multiplicity. It is a material that shifts effortlessly between different positions of architecture and landscape, human and nature. In the end, it is a call to stone, but a call that asks you to embark on your own journey of past, present and future within its world.

Endnotes

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