Variations on a Theme of Deep Time:
From Geology to Architecture

by
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- AUTHOR'S DECLARATION -

I hereby declare that I am the sole author of this thesis. This is a true copy of this thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

- ABSTRACT -

Through the lens of deep time, this thesis draws a comparison between geology and architecture, to create an architecture of simultaneity. Using Henri Bergson's notion of the present containing all of the past within it, the thesis proposes the earth as being at once a relic, a ruin, and a construction site. Within this earth, there exists the possibility to create an architecture that does not float on the top surface of time, but is embedded both in and across the deep and varying layers of time.

It is wholly apparent that architecture exists beyond our personal time frames. It exists as ruins, as monuments to past times, or built into our generation to be sent to the next – surrendering to the intractability of time. Within geological systems in the earth, epochs are embedded as stratigraphy of vast time scales, essential to the structure and depth of the world we experience in the present. Beginning with a fascination of the effects of the past existing in an altered state in the present, a comparison is made between the human, geological, and architectural agencies that are characteristic of the Anthropocene era.

The thesis is structured in two main parts: Part I 'Studies in Time' and Part II 'A 20 000 year story'. Part I consists of a series of autonomous explorations existing on various sites and non-sites, using a hybrid of representational methods to investigate and communicate possible links between the senses, the body, history, personal memory, material memory, and earth memory. Part II maintains the same level of autonomy through the fragmented illustration of a geological and historical narrative of the formation of the Niagara River. The 20 000 year story articulates relationships between visible relics and the complex processes that shape them into being. Exploring how the landscape has been transformed by both natural and human intervention, the longevity of formations and of our creations are put into comparative questioning. Describing how these moments are created, embedded, and finally eroded, a link is established between the cycles of creation and destruction with remembering and forgetting. The story concludes with a design study for the currently decommissioned Ontario Power Station Building, proposing a series of operations akin to the transformations observed in the geological and historical narrative.

- ACKNOWLEDGEMENTS -

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To Dereck Revington: though our interactions during my M.Arch degree were limited to brief encounters in the hallway, I wish to thank you for your passionate and idiosyncratic way of making and thinking about architecture in the 3B undergraduate design studio, for which all interests and current preoccupations began. I wish not to think of what this thesis might have been, had I not enrolled in your option studio.

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- TABLE OF CONTENTS -

iii Abstract

vii List of Figures

1 Introduction & Informal Essay

45 Part I - Studies in Time

93 Part II - A 20 000 Year Story

177 Epilogue

181 Archive

191 Bibliography

- LIST OF FIGURES -

page	*fig. no.*	*description*
3	0.1	KT Boundary
5	0.2	A Selection Of Parts Of Buildings, Public And Private, Erected From The Designs Of John Soane
9	0.3	Infinite Regression - “Turtles All The Way Down”
11	0.4	Wall in Auschwitz
13	0.5	ISIS and the Destruction of Memory
15	0.6	The Past Within it
17	0.7	Natural History of Photography
19	0.8	Fossils and Photographs
21	0.9	Relic, Ruin, & Construction Site
23	0.10	Image in and of Stone
25	0.11	Villa of Maecenas
27	0.12	Architecture From…
29	0.13	Guangzhou Opera House
31	0.14	Disintegration of the Crystalline Rocks
33	0.15	Continuum
35	0.16	Forces of Change
37	0.17	From Geology to Architecture
39	0.18	Architecture: Its Natural Model
41	0.19	The Works of Brodsky & Utkin
43	0.20	Gerhard Richter On Painting
47	1.1	Cliff Near Raging Water
49	1.2	Unearthed Stratigraphy
51	1.3	Tipi, the Evidence of Action
53	1.4	Partial Excavation for Covered Habitation (I)
55	1.5	Partial Excavation for Covered Habitation (II)
57	1.6	Suspended Earth for Habitation (I)
59	1.7	Suspended Earth for Habitation (II)
61	1.8	Hollowed Space & Solid Matter

63	1.9	An Infinite Sound Museum of Languages
65	1.10	Disassembled Fragments, Reassembled
67	1.11	Widmanstätten, Hidden Patterns And Processes
69	1.12	Summer Solstice, Winter Solstice, Spring Equinox Monument
71	1.13	Body Rhythm & Constructed Rhythm (I)
73	1.14	Body Rhythm & Constructed Rhythm (II)
75	1.15	Log Casted Concrete & Log Formed Glass
77	1.16	Of Mud & Hay
79	1.17	Suspended Horizons On Vertical Structures (I)
81	1.18	Suspended Horizons On Vertical Structures (II)
83	1.19	Cast-On-Cast, The Disappearing Index
85	1.20	Metamorphosis of Negative Space
87	1.21	Materializing Emptiness, Shadows of Former Acts of Domesticity
89	1.22	Shelter, Weathered By Water
91	1.23	Above and in the City
95	2.1	From Then to Now
97	2.2	Ancient Glaciers Across North America
99	2.3	Narrowing and Broadening of the Niagara River
101	2.4	Traces
103	2.5	Catastrophism & Uniformitarianism
105	2.6	Theory of the Earth
107	2.7	Cycles of Change
109	2.8	Hard and Soft Rock
111	2.9	An Index of Ancient Marine Life
113	2.10	Revealing Underlying Formations
115	2.11	Beneath the Torrent
117	2.12	Recession & Trail
119	2.13	Change Through Time
121	2.14	Fossil Wood

122 2.15 The Collapse of the Schoellkopf Power Station
125 2.16 Tesla
127 2.17 Queen Victoria Park
129 2.18 Nature Reclaims
131 2.19 Sub-Level Links
133 2.20 Industry Expansion
135 2.21 Water Journey
137 2.22 1.6km Conduits
139 2.23 Expelled Water
141 2.24 Transformations Through 1905, 1967, 2006
143 2.25 Layered Industry
145 2.26 Ice Infiltration
147 2.27 Existing Access Through Cliff
149 2.28 Between Slow And Fast Time; Between Formation, Transformation and Experience
151 2.29 Forgotten Industry
153 2.30 Long Now Foundation Membership
155 2.31 Surface and Depth
157 2.32 Studies Shaped by the Site
159 2.34 Entrance Through the Cliff
161 2.35 Cut Through the Building
163 2.36 From out the Cave
165 2.37 Between the Cliff and a Re-casted Cliff
167 2.38 New Spaces from Old Matter
169 2.39 Chronology of Artifacts
171 2.40 Spatialized Languages
173 2.41 Research Labs
175 2.42 Story Telling
179 2.43 Situated

- INTRODUCTION & INFORMAL ESSAY -

The following text serves to introduce the concepts of the thesis as well as to provide a brief backstory into the origins of the author's interests. In addition to introducing the topics, this text acts as an informal essay, outlining the principle concerns and arguments. Part I and II function as a series of operations and examples demonstrating the theories outlined in this text.

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Deep time refers to a concept put forth by 19th century geologist James Hutton, who observed the earth as being composed of an immense past, made evident in the cycles of formation and destruction that continue to be observable today. Though imperceptible on a diurnal scale, these cycles of slow transformation leave behind traces and hardened layers resulting from actions of the past. The earth's immense history is visible as striated relics of time composing the structure of the earth. Within this evidence of a past – seen as a near eternity compared to the lifetime of an individual that walks upon it – stratigraphy reveals the vast periods that separate events throughout Earth's history. A frozen frame depicting time of considerable change contains within it fragments of matter of a past once lived.

This notion of deep time – particularly the physical presence of relics to former durational events, existing simultaneously – is an observable concept outside of the field of geology as well, operating in some cases on smaller time scales.

opposite
KT BOUNDARY
Figure 0.1, Cindy Smith, "K-T Boundary (part Two)," *Garden Park Dinos*, last modified May 9, 2013, accessed July 21, 2015, http://www.gardenparkdinos.com/?p=819.

This interest of deep time stems from a fascination with observing the effects of an immediate or more distant past, existing in an altered state in the present – a transformation through time's intractability.

One can imagine that in the earth amongst a field of objects in an infinite forest, each of the objects and the natural formations that surround them having their own acts of creation and lived stories through time. In this site of earth, objects, and trees, imagine an indexed memory palace, whereby each object or feature elicits a mental transportation of sorts, bringing back the memory of its creation and transformation. It is precisely in this combined existence of the field of objects, amongst the trees, and in the earth where this thesis is situated.

opposite
A SELECTION OF PARTS OF BUILDINGS, PUBLIC AND PRIVATE, ERECTED FROM THE DESIGNS OF JOHN SOANE
Figure 0.2, Joseph Michael Gandy, *A Selection Of Parts Of Buildings, Public And Private, Erected From The Designs Of John Soane,* 1818, 130cm x 72.5cm, Exhibited at R.A., Soane Museum, accessed July 14, 2015, http://www.culturaimpopular.com/2013/04/un-encuentro-de-mentes.html.

Beginning with the first possible example in the universe, Paul Davies – a physicist, cosmologist, and astrobiologist at Arizon State University – outlines in his book entitled *Nothing: Surprising Insights Everywhere from Zero to Oblivion* (2014) that the processes within our brains function in terms of cause and effect in order to grasp ideas and the world around us.

If both space and time were created from the big bang, where the universe was physically made *with* time and not *in* time, then the assumption can be made that there was nothing before the big bang. However, in using the word 'nothing' to describe something, we are still left with the hint that there either is, or was at least *something*. When one describes a room as being empty or having *nothing* in it, this is of course false. A room may be empty of furniture or occupants, but the room itself does not contain *nothing*; for there are still textures and surfaces at its boundaries, still echoes of activities in adjacent rooms, still hints of odours from previous occupation.

When we try to understand what came before the big bang, the term 'nothing' is an insufficient descriptor. There was not a single point floating in empty darkness – in *nothingness* – there just simply *wasn't*, "In the standard picture of the cosmic origin, there was no such moment as 'half a second before.'"[1] It is both physically and logically non-existent.

1. Paul Davies, "Mysteries", in *Nothing: Surprising Insights Everywhere from Zero to Oblivion*, ed. New Scientist (The Experiment, 2014), 45.

Davies continues to outline that when people hear this statement, they feel as though they are being tricked, perhaps both logically and verbally. The truth of the matter is that our brains operate logically through terms of cause and effect,

> Because normal physical causation takes place within time, with effect following cause, there is a natural tendency to envisage a chain of causation stretching back in time, either without any beginning, or else terminating in a metaphysical First Cause, or Uncaused Cause, or Prime Mover. But cosmologists now invite us to contemplate the origin of the universe as having no prior cause in the normal sense, not because it has an abnormal or supernatural prior cause, but because there is simply no prior epoch in which a preceding causative agency – natural or supernatural – can operate.[2]

If the big bang is to be the first *cause* and the expansion of the universe is to be the *effect*, one might attempt to logically posit that there must be a series occurring before, in order to create an *effect* that would lead up to it. However, this pursuit would repeat on in an infinite regression.

2. Ibid., 49.

opposite
INFINITE REGRESSION - "TURTLES ALL THE WAY DOWN"
Figure 0.3, image by author, digital collage

Time turned into memory – or cause and effect – can be understood as the indexing of time from a durational sequence. These indexes, existing across multiple scales, can refer to physical manifestations or memories stored within our minds, all of which have the ability to transform with time. Traces act as memory cues for stories of the past, isolating specific moments.

Stratigraphy embodies epochs of the distant past; a photograph captures a personal or historical event; an impact crater is a scar in the earth from a meteorite impact; a smoothened rock depicts the wearing effects of passing water; gravitational waves remain as evidence in the universe of the big bang; and charred wood on a façade embodies the process of burning.

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opposite
WALL IN AUSCHWITZ
Figure 0.4, Stephen Lovakalieghia, "Auschwitz-Birkenau, You Are My Witnesses," *Skjourney*, December 3, 2013, accessed July 14, 2015, http://www.skjourney.com/auschwitz/.

In the present, time and experience cannot exist without memory and history; experiencing today's world becomes an encounter between perceptions and observations, past and rooted present, and thoughts of possible futures.

The transmission of oral history, books of both fictional and non-fictional origins, and works of art, all attempt to put forth a particular interpretation, set of beliefs, and discoveries through their many generations of existence. Creations are developed from thousands of years of ideas that have come before.

In Stewart Brand's *The Clock of the Long Now: Time and Responsibility* (1999), he outlines the potential danger of starting entirely anew, neglecting all that has happened previously. Siting specifically the book burning ceremonies of both China's first emperor Shih Huang-Ti during his ruling and Adolf Hitler in 1933, each leader determined to wipe out old-era history in order to ensure their vision for the future. Brand states, "Starting anew with a clean slate has been one of the most harmful ideas in history. It treats previous knowledge as an impediment and imagines that only present knowledge deployed in theoretical purity can make real the wondrous new vision."[3]

In a more contemporary instance, ISIS militants within the past year began destroying ancient artifacts, sculptures, shrines, and manuscripts in an attempt to "eliminate what [they] view as heresy"[4] in several areas including the Mosul Museum and the Mosul Central Library. Militants have said, "These books promote infidelity and call for disobeying Allah. So they will be burned."[5] This religious and cultural cleansing continues to happen throughout history, set on eradicating all physical traces of relics that attempt to communicate a world once experienced.

3. Stewart Brand, *The Clock of the Long Now: Time and Responsibility* (New York: Basic Books, 1999), 74.

4. Julian Robinson, "ISIS thugs take a hammer to civilisation: Priceless 3,000-year-old artworks smashed to pieces in minutes as militants destroy Mosul museum," *Mail Online*, last modified February 26, 2015, accessed July 22, 2015, http://www.dailymail.co.uk/news/article-2970270/Islamic-State-fighters-destroy-antiquities-Iraq-video.html.

5. Ibid.

opposite
ISIS AND THE DESTRUCTION OF MEMORY
Figure 0.5, Ibid., removal of figures through black silhouetting by author


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Citing the works of Henri Bergson, Elizabeth Grosz – during an interview with Heather Davis and Eitenne Turpin in *Architecture in the Anthropocene: Encounters Among Design, Deep Time, Science, and Philosophy* (2013) – notes that her particular fascination with his writings are his ideas about "the present containing all of the past within it, carrying it as it continuously transforms itself."[6] Grosz continues,

> The earliest events – even those bound up with the very origins of the universe, long before the evolutionary emergence of life – do not cease to have their effects on everything that is subsequent, even if they are restructured, given new impact and force, made meaningful, in their present effects. In other words, every actual present is subtended by the virtual entirety of the past. So deep time, the time of the universe's unfolding, the construction of the earth and all that appears on it, the eruption of life forms, all the momentous and unpredictable emergences never cease; they function both as an historical horizon but also as unspent forces, forces whose effects have not been used up by all the time that has separated the present from its primordial past.[7]

6. Elizabeth Grosz, "Time Matters: On Temporality in the Anthropocene," in *Architecture in the Anthropocene: Encounters Among Design, Deep Time, Science and Philosophy*, ed. Etienne Turpin (University of Michigan, Ann Arbor: Open Humanities Press, 2013), 132.

7. Ibid.

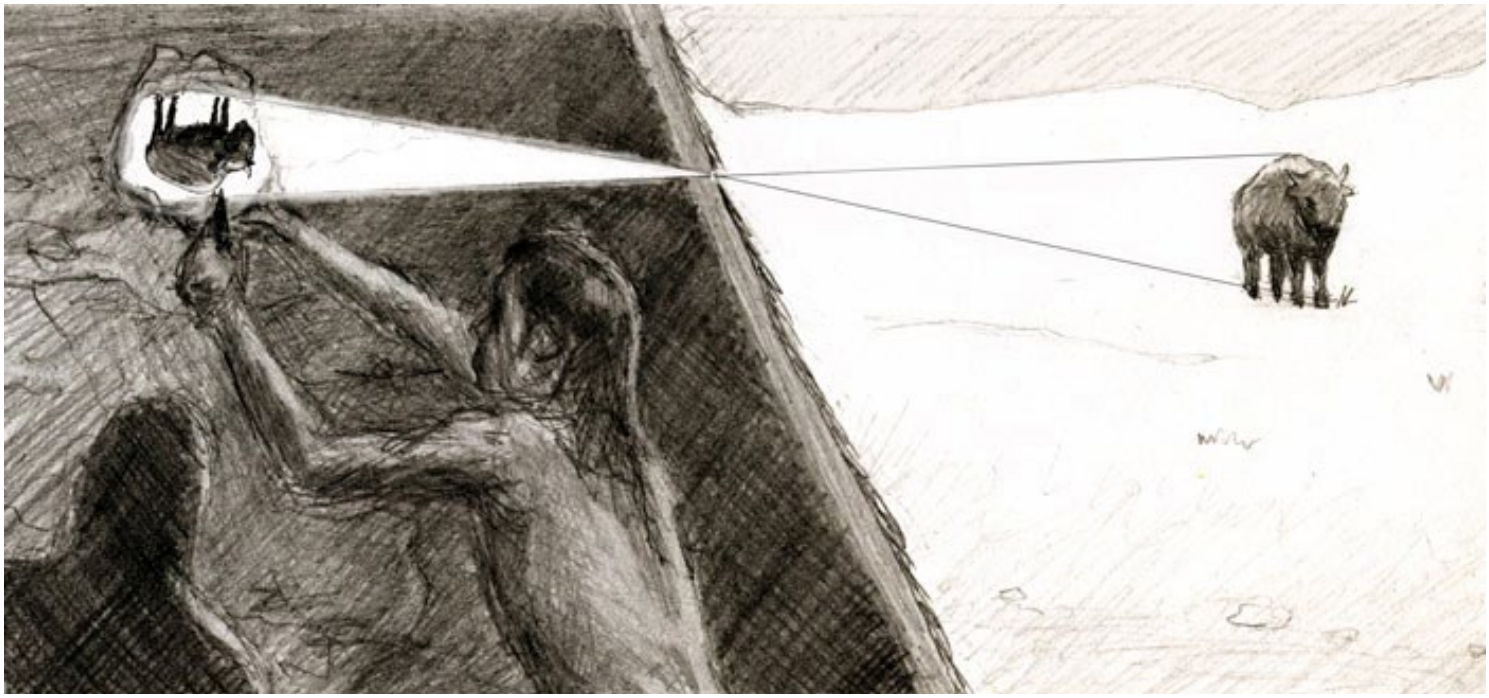
opposite
THE PAST WITHIN IT
Fig. 0.6, image by author, oil paint on wood board

In a separate chapter within *Architecture in the Anthropocene,* contributing author Adam Bobbette discusses the comparisons made by American geologist William Jerome Harrison between photography and geology. Bobbette highlights Harrison's concept of 'impressions' having foundations in the earliest and most ancient action of tanning human skin under the sun or the bleaching of wax by the sun. In the principles of photography, the act of impression traces back to Johannes Fabricius' studies in the 17th century where mined silver and chlorine compounds would turn black when left in the sun. This in combination with John Baptista Porta's camera obscura was, for Harrison, the most crucial historical period for the fine art of impressions.[8] Bobbette states, "Harrison reads photography according to the residues of deep time contained within it; while the photograph may appear as a new technical entity, it is in reality an intensification of very old physical processes. His materialist disposition led him to tell the history of photography as a natural history rather than a history of signification or representation […]. For Harrison, the contemporary photograph is a long accumulated history of the entanglements between techniques and material relations."[9]

8. Adam Bobbette, "Episodes from a History of Scalelessness: William Jerome Harrison and Geological Photography," in *Architecture in the Anthropocene: Encounters Among Design, Deep Time, Science and Philosophy*, ed. Etienne Turpin (University of Michigan, Ann Arbor: Open Humanities Press, 2013), 52.

9. Ibid., 53.

opposite
NATURAL HISTORY OF PHOTOGRAPHY
Fig. 0.7, George Faruhar, "The Camera Obscura and World of Illusions," *Scotland Guides*, April 21, 2011, accessed July 25, 2015, http://www.scotlandguides.org/tour/camera-obscura-3321.htm.



Bobbette continues to say,

> This conception of impressions remarkably approximates another natural process, namely, that of fossilization. If fossilization is the impression of softer organism onto harder geological forms, then photography is its modern, mediated extension. It is the impression of gradations of light and shadow onto stone, metallic, or glass surfaces – themselves the elder products of geological forces. This new technology is written back into the earth's deep history. […] it is a means to place the photograph deep within the history of the earth, and conversely, to treat the earth as a source of invention through the entanglements of form and matter.[10]

Citing Charles Lyell's definition of a fossil as 'any body, or the traces of the existence of any body, whether animal or vegetable, which has been buried in the earth by natural causes', one might logically posit that a rock or mineral cannot be classified as such a body. However, both Lyell and Harrison express an understanding that mineralization and the formation of rocks can in fact be made of vegetable masses, or the deep compressions of gasses, liquids, or solids all under the surface of the earth.[11] Therefore, "The fossil is no longer an object contained in a rock; within this logic, it becomes the entirety of the earth itself – the fossil is necessarily that which we inhabit and that which we read. The landscape crosses over to the order of the photograph, and vice versa; each an impression, each a fossil.[12]

This applies to not only physical things or disciplines and practices themselves, but also the landscape upon which the seat of unfolding life exists; landscape is the surface appearance and the matter within it is founded in the layers that lie below it. Bobbette continues, "The landscape becomes the physical inscription of deep time, both the result of and generator of change. It is the unthinkable immensity of time made legible and inhabitable."[13]

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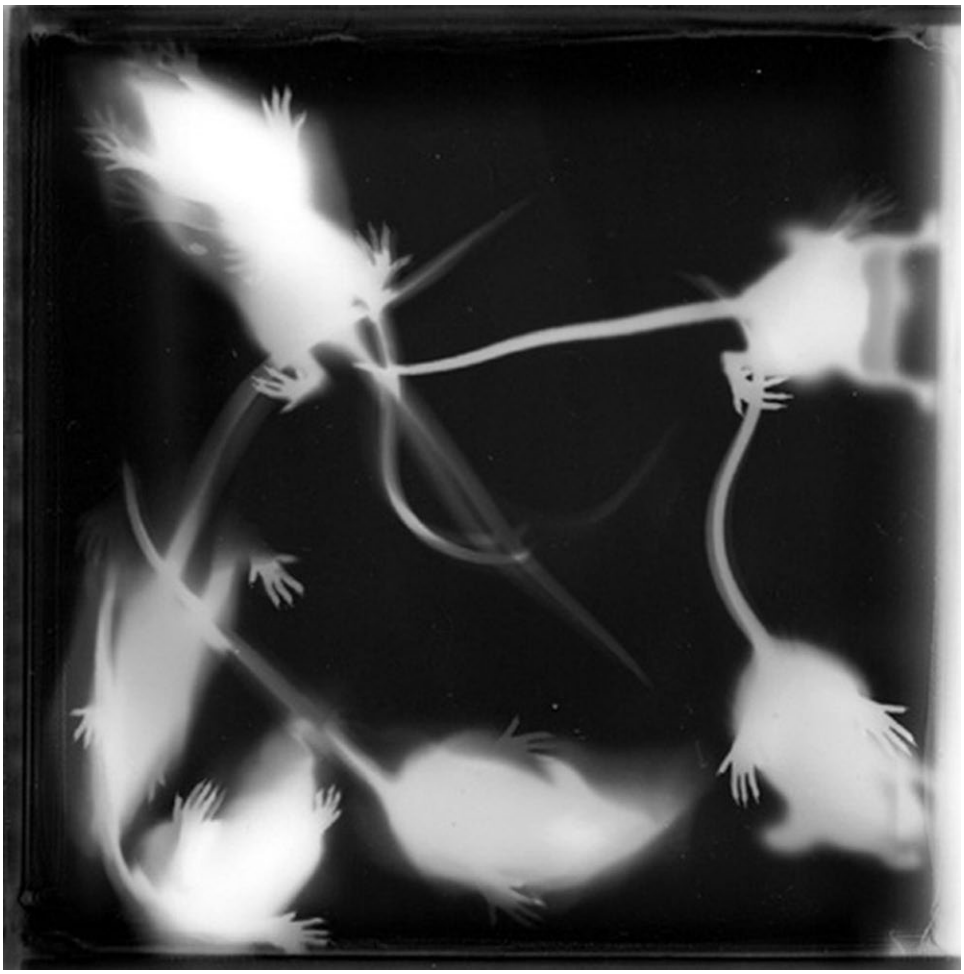
10. Ibid., 53.

11. William Jerome Harrison, *Geology of the Counties of England and of North and South Wales*, (London: Kelly & Co., 1882), v.

12. Adam Bobbette, "Episodes from a History of Scalelessness: William Jerome Harrison and Geological Photography," in *Architecture in the Anthropocene: Encounters Among Design, Deep Time, Science and Philosophy*, ed. Etienne Turpin (University of Michigan, Ann Arbor: Open Humanities Press, 2013), 54.

13. Ibid., 53.

opposite
FOSSILS & PHOTOGRAPHS
Fig. 0.8
top:
Sverre Ole Drønen, "Testing the Fossil Record," *Science Nordic*, September 9, 2014, accessed July 21, 2015, http://sciencenordic.com/testing-fossil-record.
bottom:
Hannah Biscombe, "Hannah Biscombe," *Wird*, December 17, 2013, accessed July 21, 2015, http://wird.com.ua/archives/353970.



The statement made declaring the earth as being at once a relic, a ruin, and a construction site,[14] stems from Eyal Weizman's discussion about the work of his colleagues at the Centre for Research Architecture (CRA) who include Paulo Tavares, Nabil Ahmed, Godofredo Pereira, and Adrian Lahound. Weizman notes that his colleagues see the earth as both a construction site and a ruin.[15] This statement refers to the type of investigative work done at the CRA, analyzing through spatial analysis and representation, creating a type of forensic architecture that permits a collaboration between architecture, activism, aesthetics, and politics.

For the purposes of this thesis, the statement can been expanded to consider the earth as not only a ruin and construction site, but also a relic. 'Relic' implies a surviving trace of history of the earth, distinct from man's creation. 'Artifact' on the other hand crosses over to a humanistic order; a product of man, an object, or a piece of architecture. The earth is then a place of simultaneous existence: fragmented remains of past constructions, potential for new architectural creations, and objects that remain as cues to past creation.

14. relic, ruin, and construction site refers to a statement made in the abstract of this thesis.

15. Eyal Weizman, "Matters of Calculation: The Evidence of the Anthropocene," in *Architecture in the Anthropocene: Encounters Among Design, Deep Time, Science and Philosophy*, ed. Etienne Turpin (University of Michigan, Ann Arbor: Open Humanities Press, 2013), 69.

opposite
RELIC, RUIN, & CONSTRUCTION SITE
Fig. 0.9, Aerial view of Stonehenge, "Historic Salisbury Photos," *Wiltshire*, September 24, 2014, accessed July 21, 2015, http://www.bbc.co.uk/wiltshire/content/image_galleries/historic_salisbury_photos_gallery1.shtml?77.

On writing about pictorial stones, Barbara Maria Stafford proposes, "Thus the patterned moth or flower, like the fossil script, or even man himself, exists nowhere else but in the particular and concrete container, envelope, or carapace of its matter. Design is not a separable or removable imprint or impresa stamped on the surface. It does not rest on the plane but permeates the medium and grows along with it. Design is a succinct picture or real symbol of the actual development of that medium."[16]

16. Barbara Maria Stafford, "Characters in Stones, Marks on Paper: Enlightenment Discourse on Natural and Artificial Taches," *Art Journal* 44, no. 3, Art and Science: Part II, Physical Sciences (Autumn, 1984), 235, doi: 10.2307/776823.

opposite
IMAGE IN AND OF STONE
Fig. 0.10, Storomatolite in Marble, "Scenic Rocks," *lithos-graphics*, accessed July 21, 2015, http://www.lithos-graphics.com/stones/pictureston eindex.html.

In the works of Giovanni Battista Piranesi, there exists a desire to unearth a history that is experientially distant but immanently present. His desire to construct 'cultural foundations' in a time of debate between the Ancients and the Moderns – on the origins of modern European culture[17] – is expressive in his work that "make(s) the unseen geological substrate, laying beneath the horizon, into a visible and intelligible traditional footing."[18]

Unearthing these forgotten structures brings to the foreground of the collective conscious, the physical substance on which their origins were built.

In Michel Serres's writings on the foundations of Rome, he notes, "The foundation is the theory or practice of movement. Of fusion and mélange. Of the multiplicity of time. Indeed, all foundation is, in the original sense, current. The dike was built between nature and culture. Along it one could easily return."[19]

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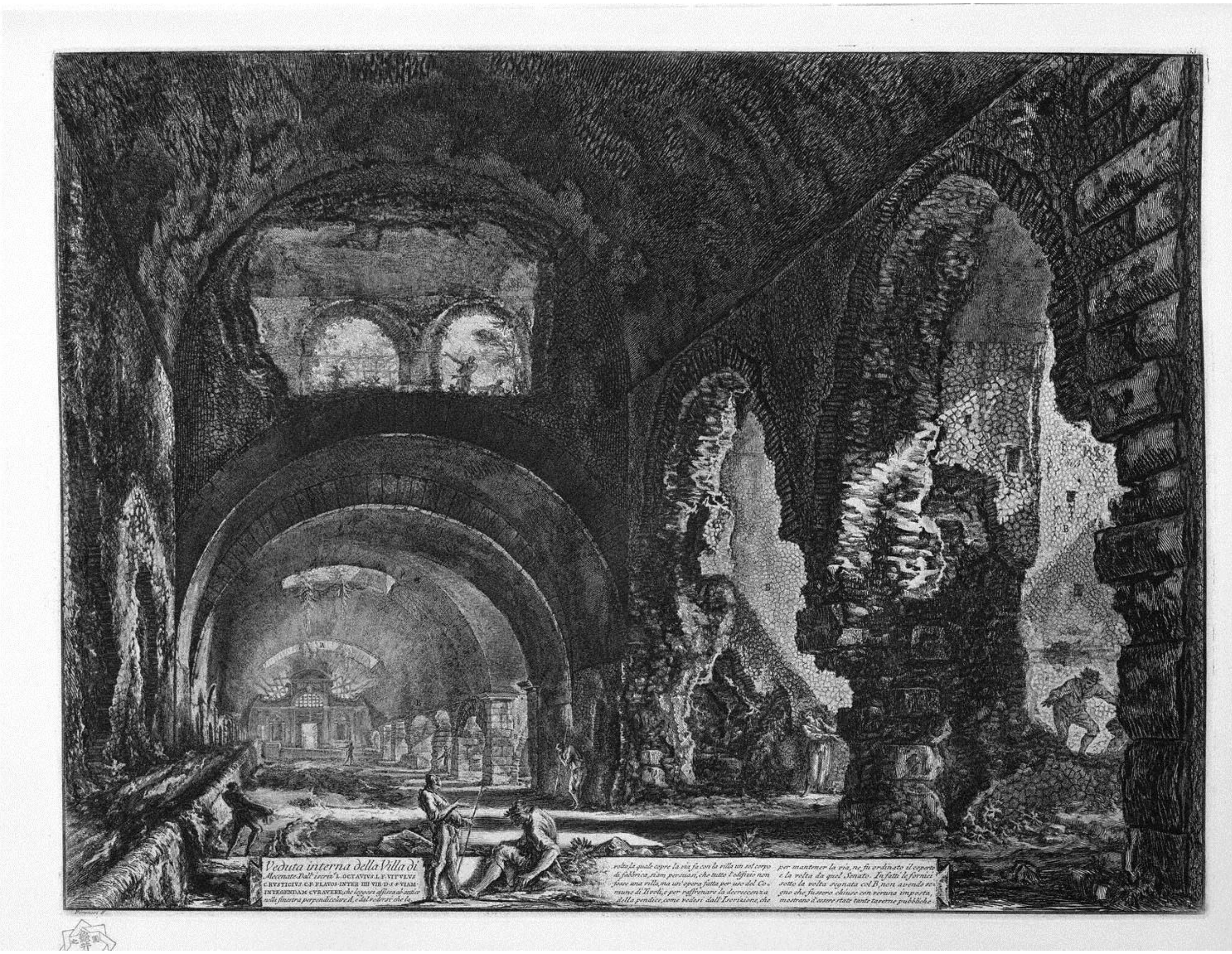
17. Amy Catania Kulper, "Architecture's Lapidarium: On the Lives of Geological Specimens," in *Architecture in the Anthropocene: Encounters Among Design, Deep Time, Science and Philosophy*, ed. Etienne Turpin (University of Michigan, Ann Arbor: Open Humanities Press, 2013), 101

18. Ibid.

19. Michel Serres, *Rome: The Book of Foundations*, trans. Felicia McCarren (Stanford: Stanford University Press, 1991), 259

opposite
VILLA OF MAECENAS
Fig. 0.11, Giovanni Battista Piranesi, *Interior view of the Villa of Maecenas*, 1764, etching, 16 7/8 in. x 23 ¾ in. Vedute di Roma, accessed July 14, 2015, http://www.wikiart.org/en/giovanni-battista-piranesi/interior-view-of-the-villa-of-maecenas.


Veduta interna della Villa di
Mecenate. Dall' iscriz.e L·OCTAVIVS·L·F·VITVLVS
C·RVSTICIVS·C·F·FLAVOS·INTER·IIII VIR·D·S·S·VIAM
INTEGENDAM·CVRAVERE; che leggesi affissa ab antico
nella finestra perpendicolare A, e dal vedersi che la
volta, la quale copre la via fa con la villa un sol corpo
di fabbrica, siam persuasi, che tutto l'edifizio non
fosse una villa, ma un'opera fatta per uso del Co-
mune di Tivoli, e per raffrenare la decrescenza
della pendice, come vedesi dall'Iscrizione, che
per mantener la via, ne fu ordinato il coperto
e la volta da quel Senato. In fatti le fornici
sotto la volta segnata col B, non avendo se-
gno che fussero chiuse con veruna imposta,
mostrano d'essere state tante taverne pubbliche.

Within many practices of contemporary architecture, it can be observed that design has become an experiment in form finding. Buildings whose smooth curved shapes and their lack of material imagination attempt to stand out and create a weightless icon without any real regard for context, culture, or the body of its users – denying the potential transactions between body, imagination, and environment.[20] Instead, an architecture of ocularcentrism has taken over, with technology used in place of design. As Jean Paul Sartre writes, "space has taken over time in human consciousness as a consequence of ocularcentrism."[21]

Even within architectural academia, there is a pedagogical shift occurring from the practice of architecture of working and making with one's hands, towards a more heavy focus on theorizing and reflecting on architecture. In Juhani Pallasmaa's seminal text *The Eyes of the Skin: Architecture and the Senses* (2012) he notes, "The current overemphasis on the intellectual and conceptual dimensions of architecture contributes to the disappearance of its physical, sensual, and embodied essence. Contemporary architecture posing as the avant-garde is more often engaged with the architectural discourse itself and mapping the possible marginal territories of the art than with responding to human existential questions. This reductive focus gives rise to a sense of architectural autism, an internalized and autonomous discourse that is not grounded in our shared existential reality."[22]

20. Kent C. Bloomer and Charles W. Moore, *Body, Memory, and Architecture* (New Haven: Yale University Press, 1977), 44.

21. Martin Jay, *Downcast Eyes the Denigration of Vision in Twentieth-century French Thought* (Berkeley: University of California Press, 1993), 149.

22. Juhani Pallasmaa, *The Eyes of the Skin: Architecture and the Senses* (Chichester: Wiley-Academy, 2005), 35.

opposite
ARCHITECTURE FROM...
Fig. 0.12, form "inspired by" Beyonce's 'Ghost' music video for Elenberg's Melbourne Tower
top:
VEVO. "Beyonce - Ghost", accessed July 14, 2015. https://www.youtube.com/watch?v=aY9vZv7HCvo.
bottom:
"Beyonce's Curves Inspire Elenberg Fraser's Design for Melbourne Tower," *ArchDaily*, accessed July 14, 2015, http://www.archdaily.com/769786/beyonces-curves-inspire-elenberg-fraser-designed-tower-in-melbourne.


vevo

Regarding materiality and the eye, Pallasma notes,

> As buildings lose their plasticity, and their connection with the language and wisdom of the body, they become isolated in the cool and distant realm of vision. With the loss of tactility, measures and details crafted for the human body – and particularly for the hand – architectural structures become repulsively flat, sharp-edged, immaterial and unreal. The detachment of construction from the realities of matter and craft further turns architecture into stage sets for the eye […] These products of instrumentalised technology conceal their processes of construction, appearing as ghostlike apparitions. The increasing use of reflective glass in architecture reinforces the dreamlike sense of unreality and alienation.[23]

Continuing with the topic of materiality and time, Pallasma outlines,

> Natural materials – stone, brick, and wood – allow our vision to penetrate their surfaces and enable us to become convinced of the veracity of matter. Natural materials express their age, as well as the story of their origins and their history of human use. All matter exists in the continuum of time; the patina of wear adds the enriching experience of time to the materials construction. But the machine-made materials of today – scaleless sheets of glass, enameled metals and synthetic plastics – tend to present their unyielding surfaces to the eye without conveying their material essence or age. Buildings of this technological era usually deliberately aim at ageless perfection, and they do not incorporate the dimension of time, or the unavoidable and mentally significant processes of aging. This fear of the traces of wear and age is related to our fear of death.[24]

23. Juhani Pallasmaa, *The Eyes of the Skin: Architecture and the Senses* (Chichester: Wiley-Academy, 2005), 34.

24. Ibid.

opposite
GUANGZHOU OPERA HOUSE
Fig. 0.13, Larry Speck, "Thinking About Architecture By Larry Speck," *Archinect Blog*, August 8, 2012, accessed July 14, 2015, http://archinect.com/blog/article/54932566/top-architectural-record-award-for-guangzhou-opera-house-really.

In Eugène Emmanuel Viollet-le-Duc's 1876 book, he creates a work entitled 'Disintegration of the Crystalline Rocks' wherein he represents the transformative geological process of Mont Blanc. Within these illustrations, he depicts not the actuality of Mont Blanc, but the processes of crystalline disintegration, depicting matter that is undergoing a change of state. Using Henri Bergson's assertion of "form is only a snapshot view of a transition,"[25] contributing author Amy Catania Kulper in *Architecture in the Anthropocene* notes that at both micro and macro scales, the processes of glacial formation are rendered legible, depicting the scene of a process that appears to be in a perpetual cycle of making.[26]

Practices focused on form-finding propose architectures that freeze-frame hypothetical phenomena in transition. Phenomena undergoing long or never-ending transformations participate in a constantly changing cycle. To pluck a frame from this cycle and lend it to immateriality – such as synthetic plastic – is an attempt to spatialize a transient moment, making it concrete, and ultimately denying its participation in the naturally occurring cycles of time. It attempts to defy that which cannot be defied, using technological trends within architecture that quickly become obsolete.

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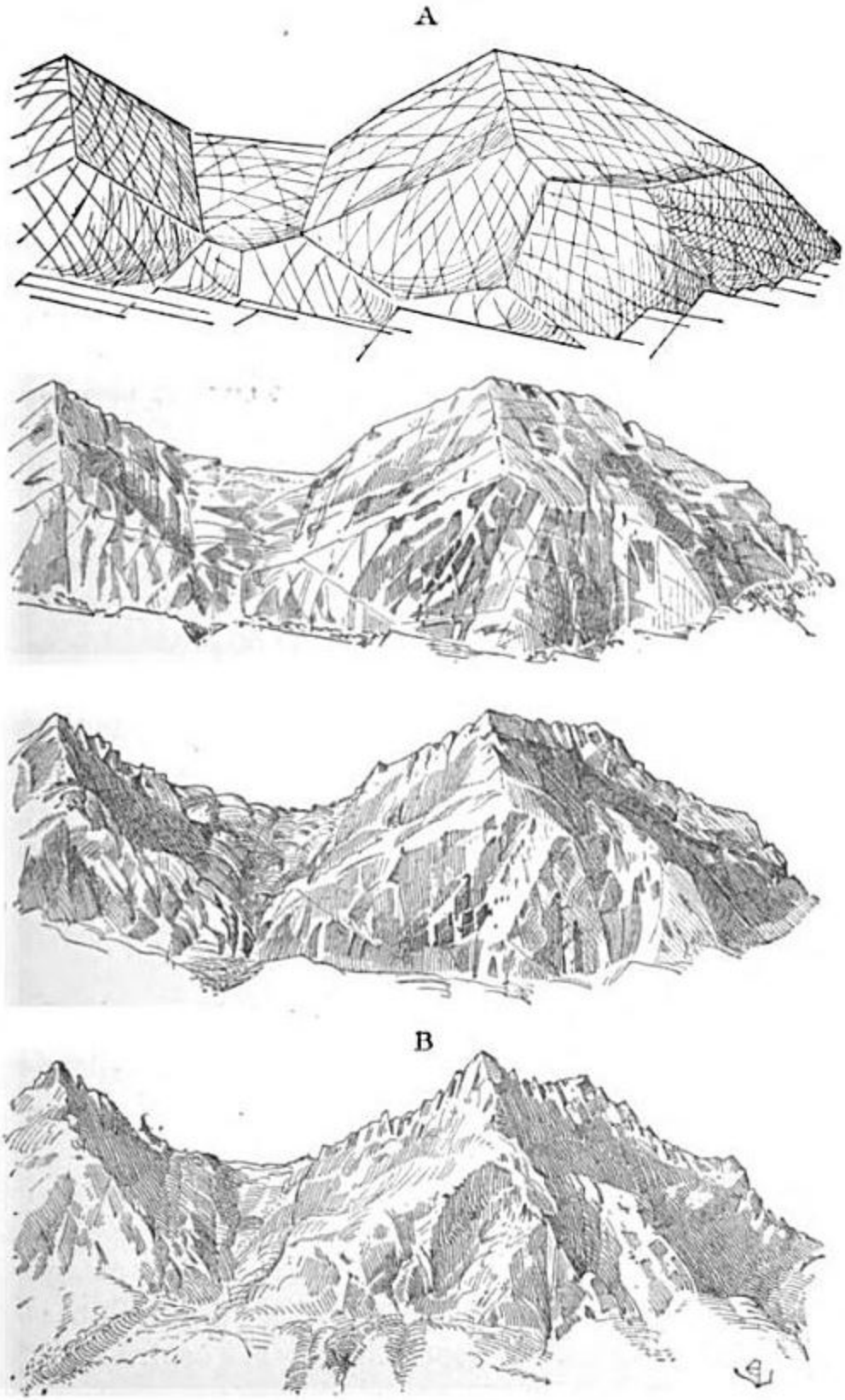
25. Henri Bergson, *Creative Evolution*, translated by Arthur Mitchell (Lanham, Md.: University Press of America, 1983), 302.

26. Amy Catania Kulper, "Architecture's Lapidarium: On the Lives of Geological Specimens," in *Architecture in the Anthropocene: Encounters Among Design, Deep Time, Science and Philosophy*, ed. Etienne Turpin (University of Michigan, Ann Arbor: Open Humanities Press, 2013), 94.

opposite
DISINTEGRATION OF THE CRYSTALLINE ROCKS
Fig. 0.14, Eugene Emmanuel Viollet-le-Duc, *Mont Blanc: A Treatise on Its Geodesical and Geological Constitution; Its Transformations; and the Ancient and Recent State of Its Glaciers,* translated by B. Bucknall, (London: Sampson Low, Marston, Searle, and Rivington, 1875), 109.


A
B

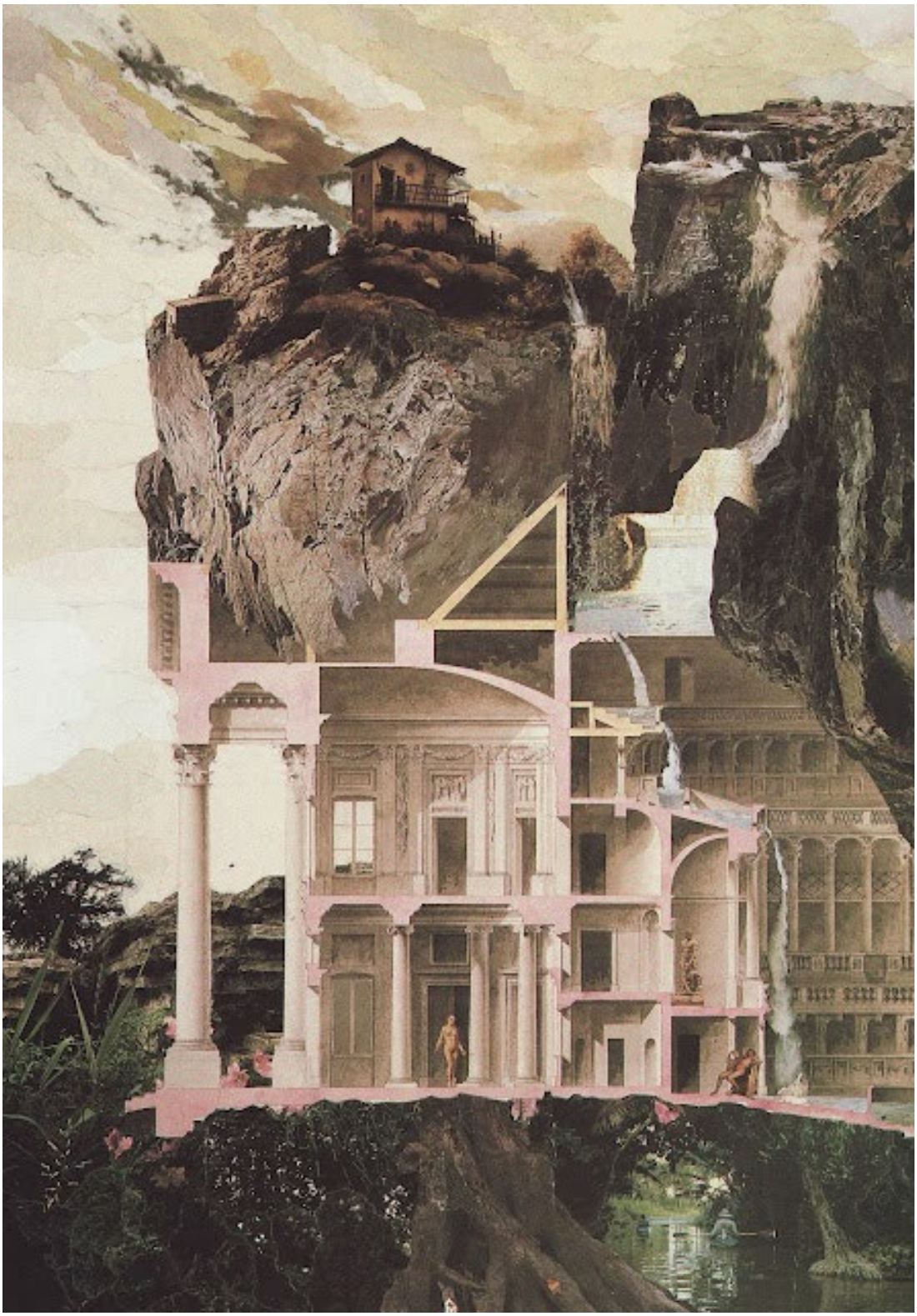
In order to inhabit the continuum of time, humans must be able to identify a rootedness within the experience of architecture, not only referring to the discipline, but to the man-made and natural bodies of which it is a part of. We are as much a part of the earth as the earth is a part of us and our creations.

As American therapist Gotthard Booth notes, "nothing gives man fuller satisfaction than participating in processes that supersede the span of individual life."[27] Pallasmaa builds upon this statement claiming, "We have a mental need to grasp that we are rooted in the continuity of time, and in the man-made world it is the task of architecture to facilitate this experience. Architecture domesticates limitless space and enables us to inhabit it, but it should likewise domesticate endless time and enable us to inhabit the continuum of time."[28]

27. From a conversation with Professor Keijo Petaja in the early 1980's; the source is identified, as noted in Pallasmaa's *They Eyes of the Skin* (2005)

28. Juhani Pallasmaa, *The Eyes of the Skin: Architecture and the Senses* (Chichester: Wiley-Academy, 2005), 35.

opposite
CONTINUUM
Fig. 0.15, "ART SVIS515S: Representing Architecture," *Duke.edu*, last modified September 22, 2014, accessed July 25, 2015, http://sites.duke.edu/artsvis515s/assignment-3-hand-draftingcompositing-working-drawings-to-analytiques/image/.



Characteristic of the Anthropocene era, the actions of man have had a transformative impact on the surrounding world; just as the natural elements inflict change upon the landscape.

In George Perkins Marsh's publication *Physical Geography as Modified by Human action* (1864) he introduces the topic of the agencies of humans acting as a force of change on the landscape, noting, "As we have seen, man has reacted upon the organized and inorganic nature, and thereby modified, if not determined, the material structure of his earthly home."[29]

29. George Perkins Marsh, *Physical Geography as Modified by Human Action* (New York: Charles Scribner, 1864), 8.

opposite
FORCES OF CHANGE
Fig. 0.16,
top:
"Open-pit Mining Engineering," *CCTEG Shenyang Engineering Company*, accessed July 21, 2015, http://en.zmsyy.com/comcontent_detail2/&columnsId=54.html.
bottom:
Walter Siegmund, "Chevron Crevasses," *Wikipedia*, last modified May 11, 2013, accessed July 21, 2015, https://en.wikipedia.org/wiki/File:Chevron_Crevasses_00.JPG.

Geology can even make its way into the matter of buildings; a mass in its volume or an element of its structure. Eyal Weizman comments, "Geological formations exist both inside and outside buildings. They are obviously the ground on which buildings stand, but also appear in construction materials, as stones or the gravel within concrete."[30] Weizman continues, demonstrating the 'crack' appearing across several bodies, "A denser concentration of minerals within a rock will often become the line of least resistance, along which a crack will tear it, and likewise the building, apart. So seismic cracks are interesting because they connect the geological, the urban, and the architectural. Cracks are a fantastic demonstration of a shared materiality of the planet, moving from geology to architecture."[31] He concludes with, "…a building is not ontologically or epistemologically different from the rock or gravel in which it is anchored."[32]

30. Eyal Weizman, "Matters of Calculation: The Evidence of the Anthropocene," in *Architecture in the Anthropocene: Encounters Among Design, Deep Time, Science and Philosophy*, ed. Etienne Turpin (University of Michigan, Ann Arbor: Open Humanities Press, 2013), 67.

31. Ibid.

32. Ibid.

opposite
FROM GEOLOGY TO ARCHITECTURE
Fig. 0.17, Department of Agriculture, Office of Public Roads, "A Photo Album of the 1906 San Francisco Earthquake," *Windows to the Universe*, last modified May 20, 2008, accessed July 21, 2015, http://www.windows2universe.org/earth/geology/quake_1906_images.html.

In Joseph Michael Gandy's *Architecture: Its Natural Model* (1838), he depicts a narrative of the entanglements between human and geological time, juxtaposing elements throughout the history of both bodies, into a single naturalized setting. In the foreground, our primitive mammal ancestor constructs a hut of tree branches for shelter, against the geological backdrop of naturally formed shelters of the earth. Presented alongside one another, these geological fragments, each a relic to a different epoch, span a distance in time not unlike the evolutionary distance between man and primate.

On this work, Amy Catania Kulper comments, "[it] deploys hybrid logics as a vehicle of immanence, operating between the activities of humans and primates, and between the formal logics of geology and architecture. Gandy's *capriccio* is a collection of natural wonders that positions geological "life" between the site-specificity of the individual formations and the agency of the human imagination capable of gathering them together. Within this capriccio we witness the seamless merging of natural creation and human production."[33]

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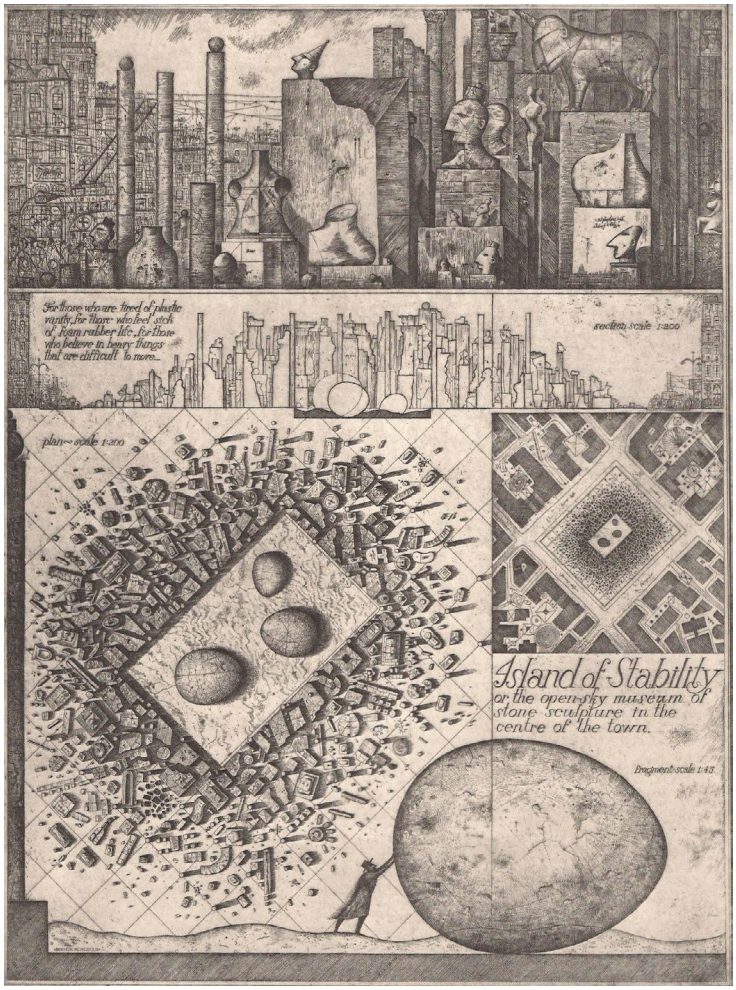
33. Amy Catania Kulper, "Architecture's Lapidarium: On the Lives of Geological Specimens," in *Architecture in the Anthropocene: Encounters Among Design, Deep Time, Science and Philosophy*, ed. Etienne Turpin (University of Michigan, Ann Arbor: Open Humanities Press, 2013), 106.

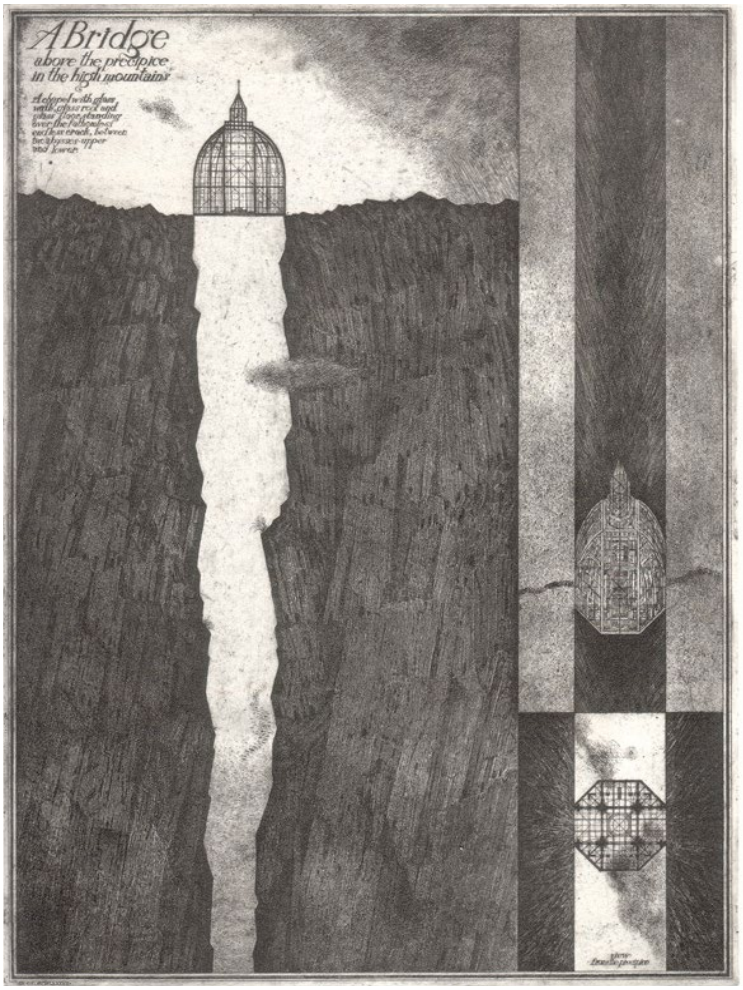
opposite
ARCHITECTURE: ITS NATURAL MODEL
Fig. 0.18, Joseph Michael Gandy, *Architecture: Its Natural Model*, 1838, oil on canvas, 80 in. x 52 in., Sir John Soane's Museum, London, accessed July 14 2015, https://commons.wikimedia.org/wiki/File:Joseph_Gandy_001.jpg.

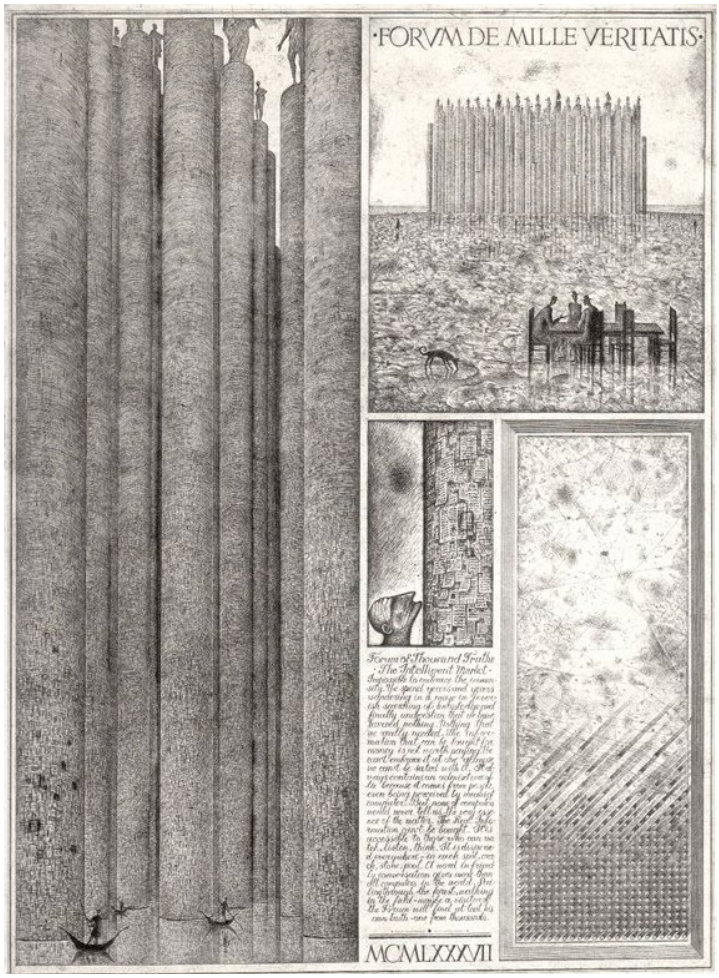
The work that follows is structured in two main parts: Part I 'Studies in Time' and Part II 'A 20 000 year story'. Part I consists of a series of autonomous explorations existing on various sites and non-sites, using a hybrid of representational methods to investigate and communicate possible links between the senses, the body, history, personal memory, material memory, and earth memory. Part II maintains the same level of autonomy through the fragmented illustration of a geological and historical narrative of the formation of the Niagara River. The 20 000 year story articulates relationships between visible relics and the complex processes that shape them into being; highlighting that the present contains traces of the past and alludes to the future. Exploring how the landscape has been transformed by both natural and human intervention, the longevity of formations and of our creations are put into comparative questioning. Describing how these moments are created, embedded, and finally eroded, a link is established between the cycles of creation and destruction with remembering and forgetting. The story concludes with a design study for the currently decommissioned Ontario Power Station Building, proposing a series of operations akin to the transformations observed in the geological and historical narrative.

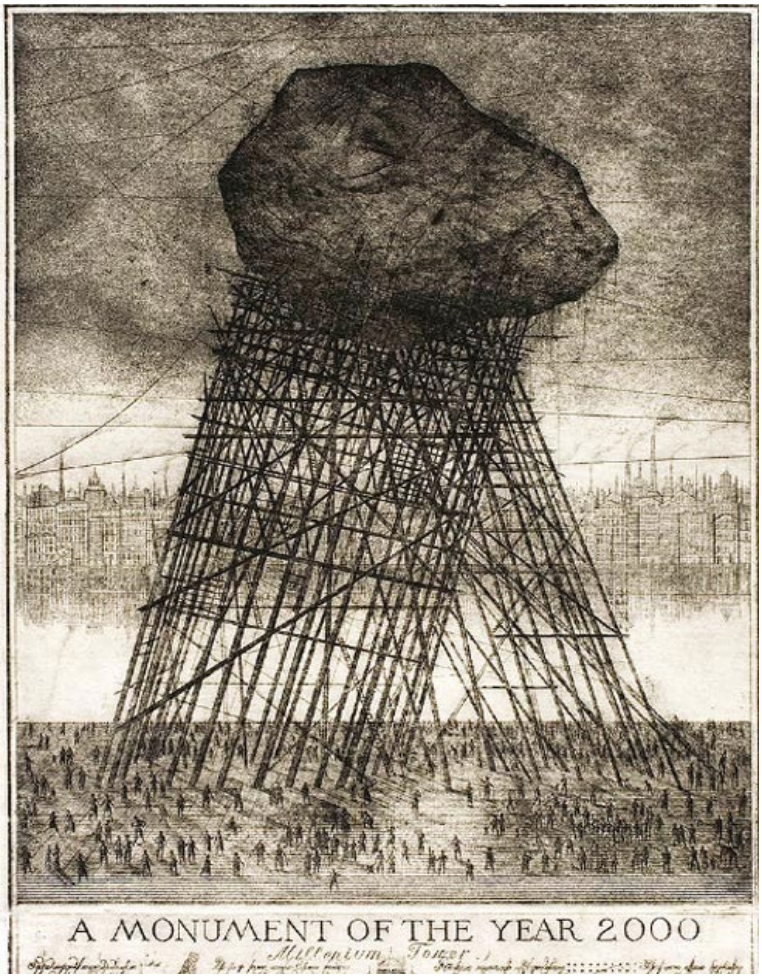
While each work can be seen as separate artifacts, embedded in various sites and non-sites, their underlying connections and motives remained the same: to establish a concrete position in architecture illustrated through conceptual proposals.

opposite
THE WORKS OF BRODSKY & UTKIN
Fig. 0.19, J. Morrison "The Paper Architecture of Brodsky and Utkin," *The Nonist*, last modified February, 2010, accessed July 21, 2015, http://thenonist.com/index.php/weblog/permalink/the_paper_architecture_of_br%0Dodsky_utkin.


section scale 1:200
plan scale 1:200
Island of Stability
or the open-sky museum of stone sculpture in the centre of the town.
fragment scale 1:45


A Bridge
above the precipice
in the high mountains


·FORVM DE MILLE VERITATIS·
MCMLXXXVII


A MONUMENT OF THE YEAR 2000

The format of the thesis is to display text on the left to accompany the visual on the right. The images, some concrete while others are more abstract, are an attempt in creating legible indexes of thought, describing the intentions and ideas of the work – ideas that can be evoked, but are often difficult to translate.

Juhani Pallasmaa notes in his book *The Eyes of the Skin* (2005) the fact that words can often fall short of explaining and conjuring an image in the viewer's mind of the author's true intention, "The verbal statements of artists and architects should not usually be taken at their face value, as they often merely represent a conscious surface rationalization, or defense that may well be in sharp contradiction with the deeper unconscious intentions giving the work its very life force."[34] It is the author's hope that the story of the thesis can be understood through the pages on the right, while the pages on the left merely serve as formal supplementary notes in the story-telling of the thesis.

The collaging style reflects the very theme of the work that many of the images aim to depict. They are collages of elements – photographs of textures, models, and fragments of natural settings, captured at various times and borrowed from various sources – skewed to communicate a new intention, separate but similar from its original source.

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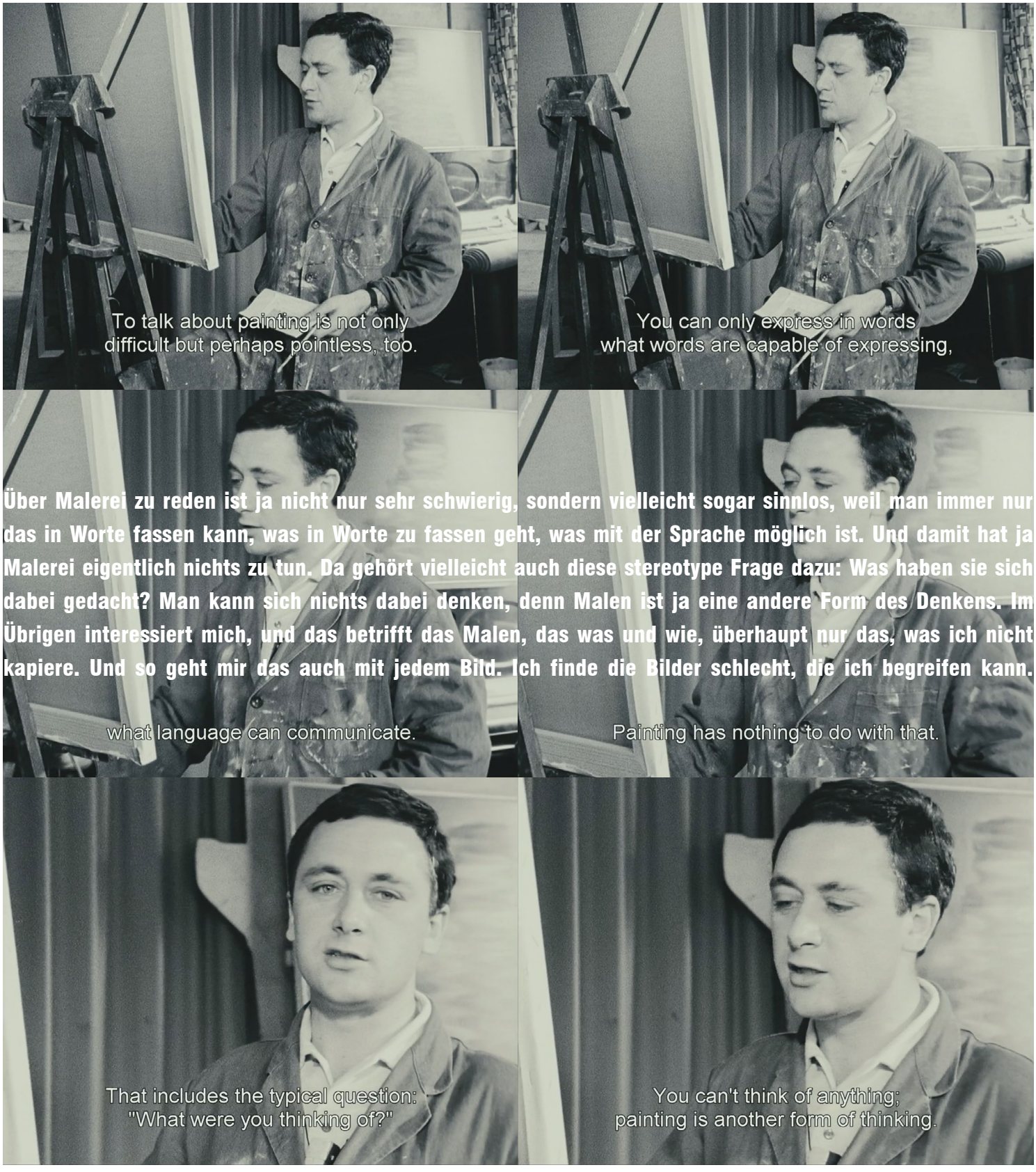
34. Juhani Pallasmaa, *The Eyes of the Skin: Architecture and the Senses* (Chichester: Wiley-Academy, 2005), 32.

opposite
GERHARD RICHTER ON PAINTING
"To talk about painting is not only difficult but perhaps pointless, too. You can only express in words what words are capable of expressing, what language can communicate. Painting has nothing to do with that. That includes the typical question, 'What were you thinking of?' You can't think of anything; painting is another form of thinking."
Figure 0.20, screenshots from *Gerhard Richter - Painting*, directed by Corinna Belz (2011; Germany: Goethe-Institut, 2012), DVD



Über Malerei zu reden ist ja nicht nur sehr schwierig, sondern vielleicht sogar sinnlos, weil man immer nur das in Worte fassen kann, was in Worte zu fassen geht, was mit der Sprache möglich ist. Und damit hat ja Malerei eigentlich nichts zu tun. Da gehört vielleicht auch diese stereotype Frage dazu: Was haben sie sich dabei gedacht? Man kann sich nichts dabei denken, denn Malen ist ja eine andere Form des Denkens. Im Übrigen interessiert mich, und das betrifft das Malen, das was und wie, überhaupt nur das, was ich nicht kapiere. Und so geht mir das auch mit jedem Bild. Ich finde die Bilder schlecht, die ich begreifen kann.

- PART I -
STUDIES IN TIME

"He who has observed the quarrying of stone from a rock, and has seen it shipped from some distant port, and then endeavors to conceive what kind of edifice will be raised by the materials is in the same predicament as a geologist, who, while he is confined to the land, sees the decomposition of rocks, and the transportation of matter by rivers to the sea, and then endeavors to picture himself the new strata which Nature is building beneath the waters."[35]

Waves formed by a distant and invisible wind, crashing against a cliff formed in layers from distant epochs. Breaking and crashing, repeating on in infinity, a cycle occurs in *fast* time; layers upon layers of lithified aggregates, concretized as evidence of distant epochs, forming in *slow* time.

35. Charles Lyell, *Principles of Geology or, the Modern Changes of the Earth and its Inhabitants* (London: John Murray, 1854), 81.

opposite
CLIFF NEAR RAGING WATERS
Figure 1.1, image by author, acrylic paint on concrete panel with digital collage

Peering far into the abyss of time, unearthed layers formed some 10 000 years apart are split and erected vertically. The animated being moves between the layers of vast time, just as the grass grows between the cracks and atop the strata.

opposite
UNEARTHED
STRATIGRAPHY
Figure 1.2, image by author,
digital collage


year (x-5000)
year (x-10000)
year (x-15000)
year (x-20000)
year (x-25000)
year (x-30000)
year (x-35000)
year (x-40000)

A tipi is an architecture bearing the evidence of action. A primitive domestic enclosure, perhaps considered anachronistic, made of the contents of the forest: trees and wandering beasts. The eye can anticipate the feeling of the wood structure, the dense and wiry hide, and the firm leathery skin on the reverse.

opposite
TIPI, THE EVIDENCE OF ACTION
Figure 1.3, image by author, photograph transfer on engraved plywood with acrylic paint

A partial excavation creates covered habitation. An archaeologist's excavation grid is overlaid on the site to uncover former constructions buried in time, hidden below a now-empty field.

opposite
PARTIAL EXCAVATION FOR COVERED HABITATION (I)
Figure 1.4, image by author, concrete model and digital collage

The uncovered fragments of structures become the material and geometric-based framework for the constructed walls, supporting a floating roof. The walls become an abstracted property of the structures uncovered in the act of excavating the earth.

opposite
PARTIAL EXCAVATION FOR COVERED HABITATION (II)
Figure 1.5, image by author, concrete model and digital collage

A place for suspended habitation created through the simple act of unearthing and displacing a volume, balanced atop wooden beams. The entrance sequence through a ruined archway of a former construction frames the descent into the earth, before entering into the void of the cut, and then ascending into the displaced volume of earth for living. There exist multiple concretizations of time, through the simultaneous existence of wooden artifacts, ruins, and new constructions.

opposite
SUSPENDED EARTH FOR HABITATION (I)
Figure 1.6, image by author, digital collage

A place for grounded habitation created through the simple act of unearthing and displacing a volume, balanced atop wooden beams. Peering into the outside world beyond, through a slit in the earth centered between the suspended volume and the void left from suspension.

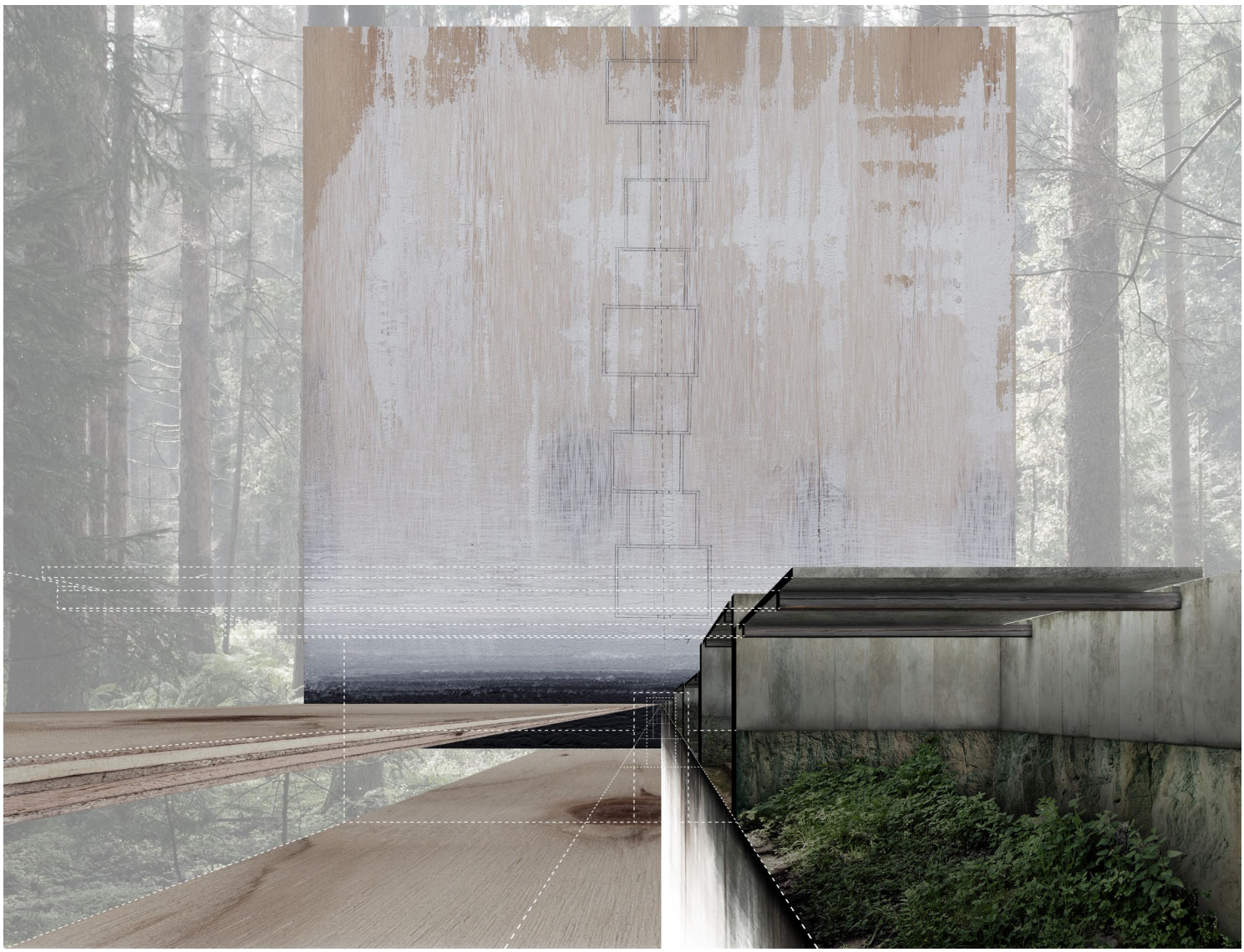
opposite
SUSPENDED EARTH FOR HABITATION (II)
Figure 1.7, image by author, digital collage

Hollowed space and solid matter; the horizon line is the divide between the existing and a mirrored imagined space. The remains of thick walls appear now as raised passages – catwalks between framed patches of grass. These become the passages between stone volumes suspended in the air, inverting the solid and void relationship between the real and the conceptualized.

opposite
HOLLOWED SPACE &
SOLID MATTER
Fig. 1.8, image by author, digital collage

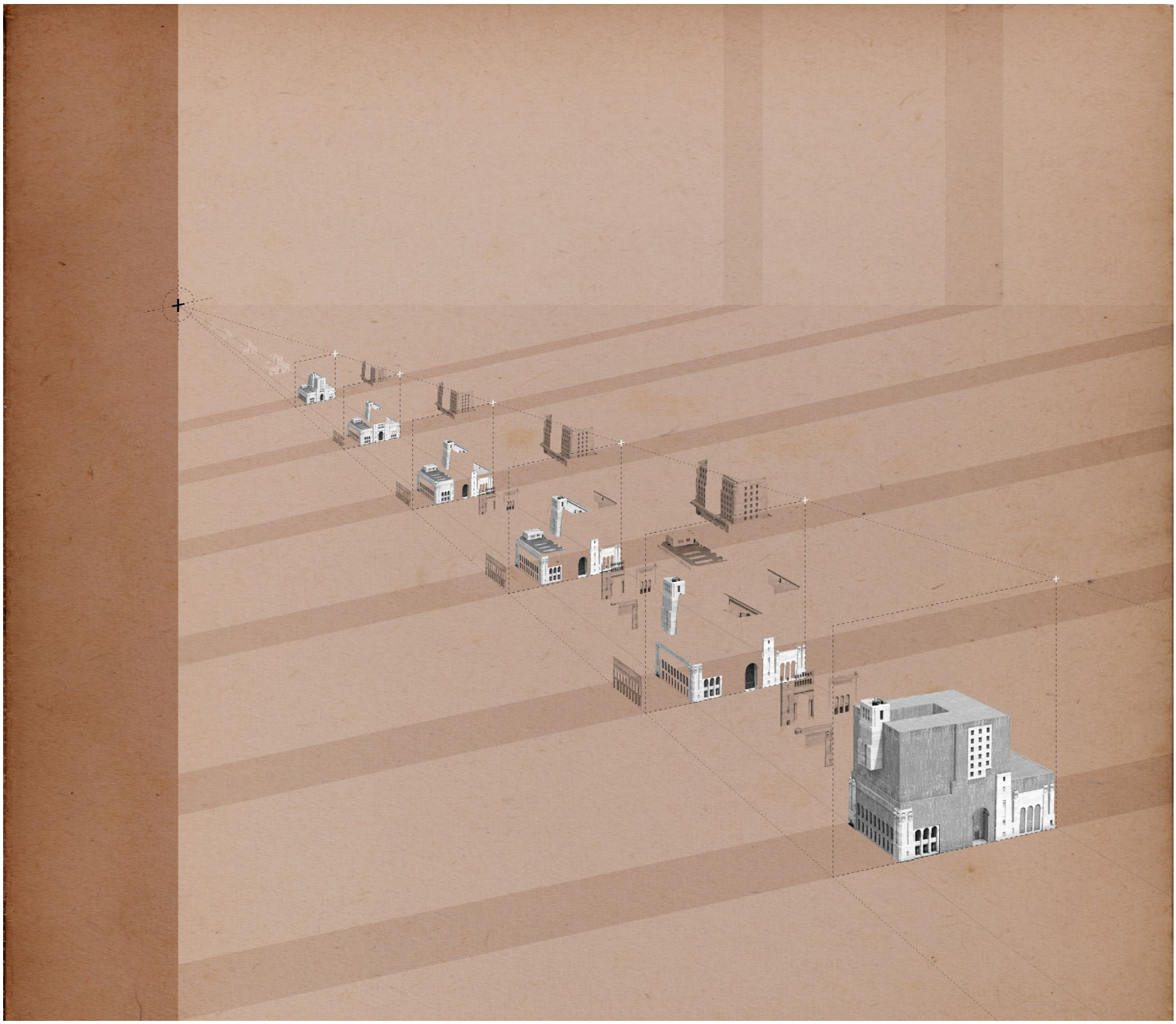
A museum whose repetition of volumes continues on *ad infinitum*, with only minor variation. Each room, sealed off from the ones adjacent, plays on repeat a greeting from one of the languages of the world. Lost languages of forgotten tribes, languages of distant continents, and languages of familiar tongue, interrupted only by the sounds of their surroundings. A language given physical form, forever remembered in the echoes of repeating enclosures.

opposite
AN INFINITE SOUND
MUSEUM OF LANGUAGES
Figure 1.9, image by author,
acrylic painting on plywood
with digital collage



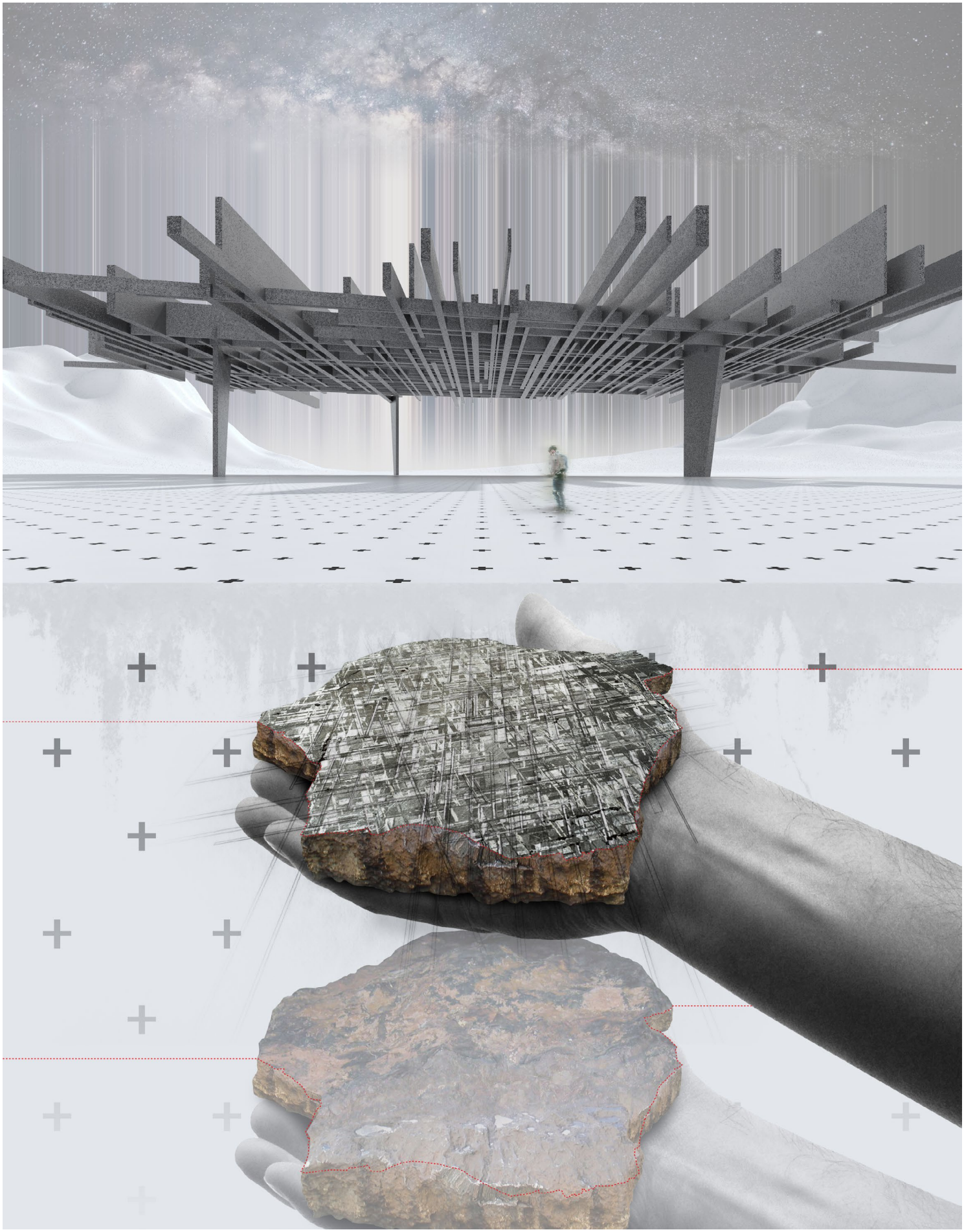
All buildings go through varying levels of decay: some repaired and others falling to ruins. The building and the memories that assign to it meaning are stripped down to fragments. These fragments are re-ordered, re-assembled, and re-cast into a new whole.

opposite
DISASSEMBLED FRAGMENTS, REASSEMBLED
Figure 1.10, image by author, digital collage



Through nitric acid treatment, a hidden pattern emerges. The iron asteroid centre exposes its inner composition of alternating kamacite and taenite bands that oxidize at various rates and reveal themselves in distinct axonometric compositions. This invisible pattern is rendered visible and is translated into a pavilion composed of iron slabs varying in thickness and depth.

opposite
WIDMANSTÄTTEN, HIDDEN PATTERNS AND PROCESSES
Figure 1.11, image by author, digital collage

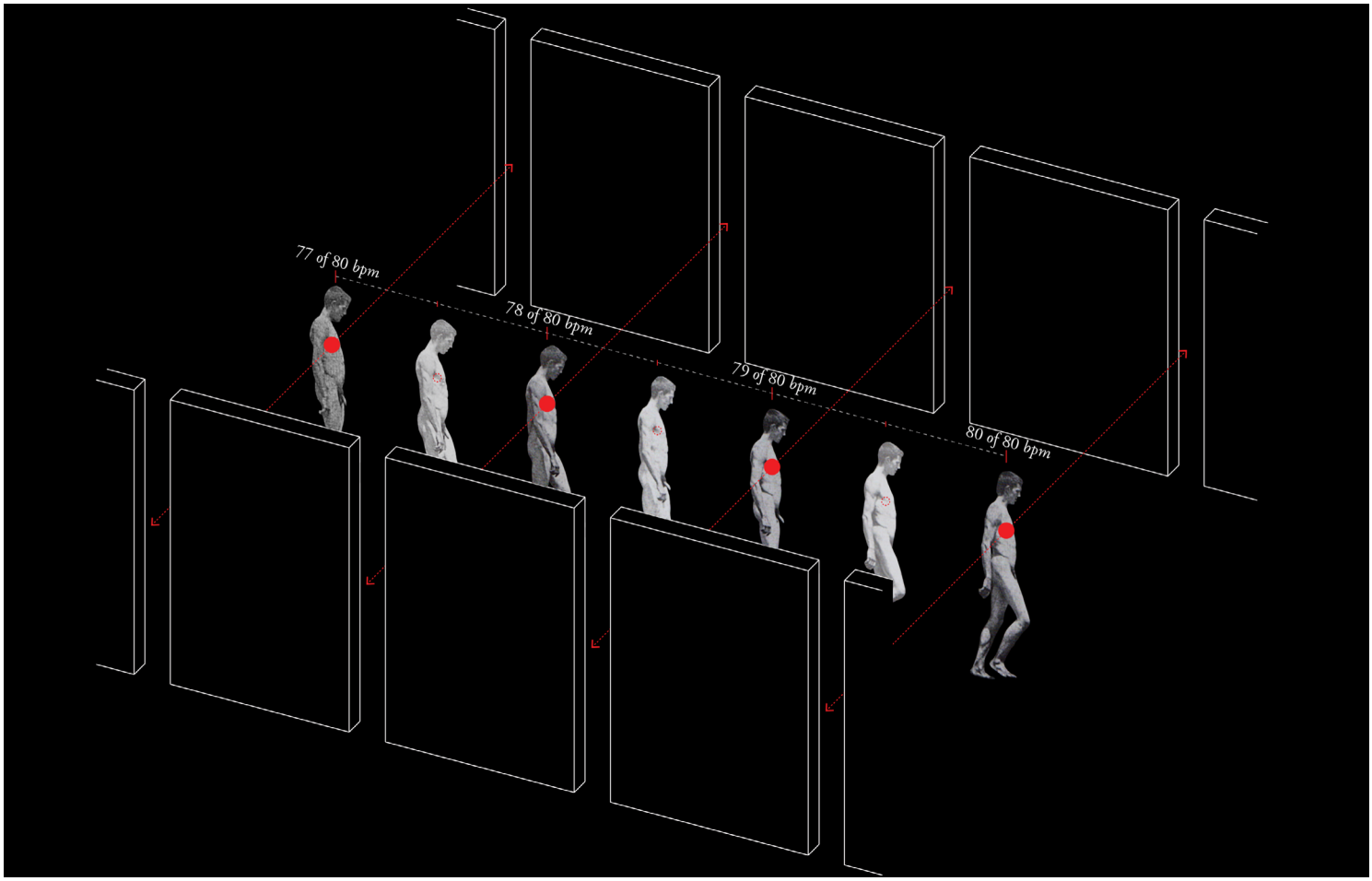


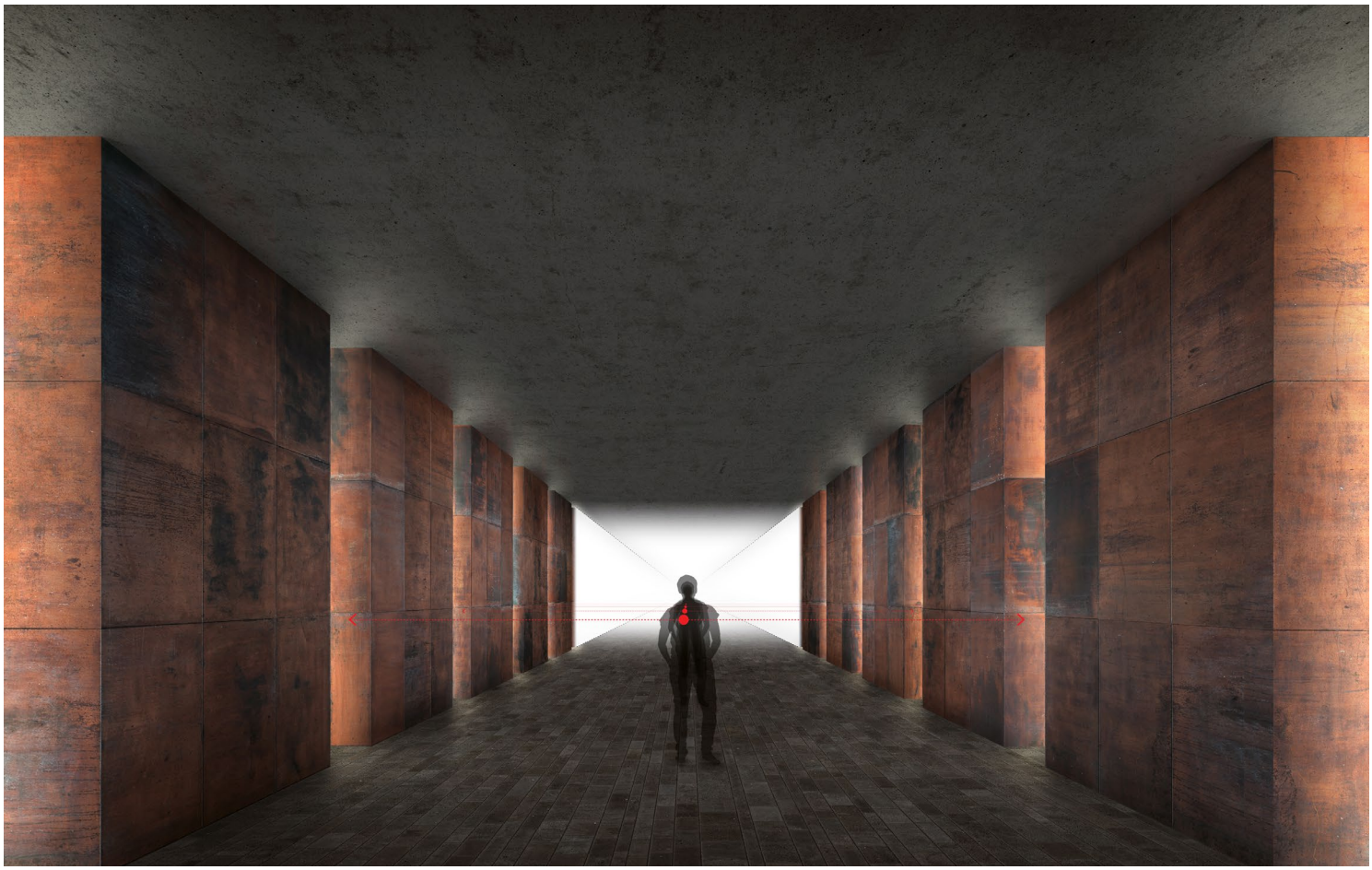
Three fragments, distinct in their own material composition, are intersected together to form a structure whose precise alignment in space corresponds with three specific moments in the calendar year: the alignment of the sun during the summer solstice, winter solstice, and spring equinox. A calculated strip of light illuminates one of the three corresponding pathways, dependent upon the time of year. Though the impact of the sun's presence is felt daily, the manipulation of light and shadow of specific moments in time gives its presence a physical form; a repeating cycle for as long as there is Earth and Sun.

opposite
SUMMER SOLSTICE,
WINTER SOLSTICE,
SPRING EQUINOX,
MONUMENT
Figure 1.12, image by author,
digital collage

The body's rhythm of movement at a walking pace is externalized and projected outwards. The heart rate of an individual, projected as voids into the mass of the building, creates calculated and rhythmic striations of light. Between man and man's creation, a synchronistic relationship is created.

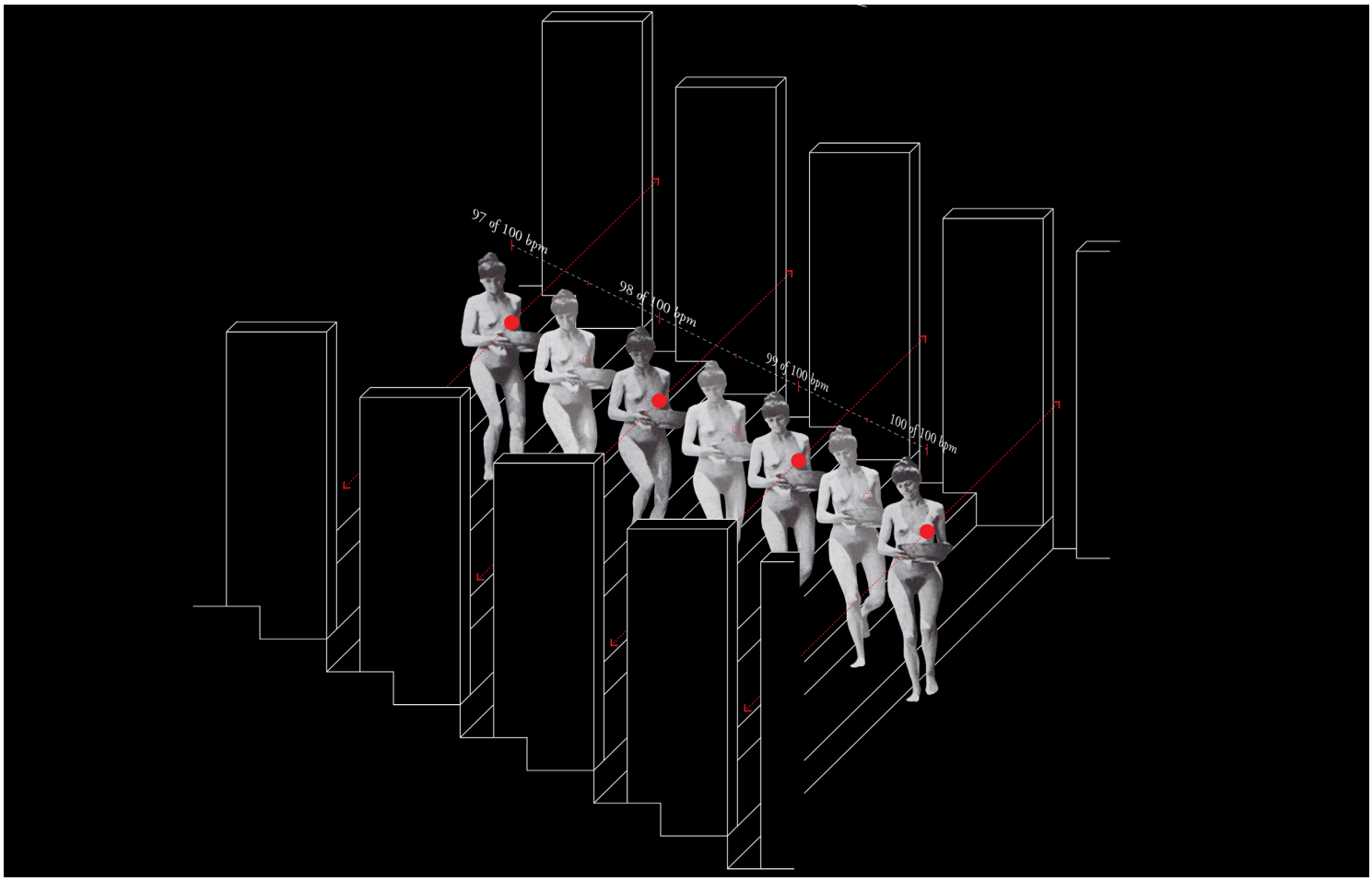
opposite
BODY RHYTHM &
CONSTRUCTED RHYTHM
(I)
Figure 1.13, image by author,
digital collage


77 of 80 bpm
78 of 80 bpm
79 of 80 bpm
80 of 80 bpm



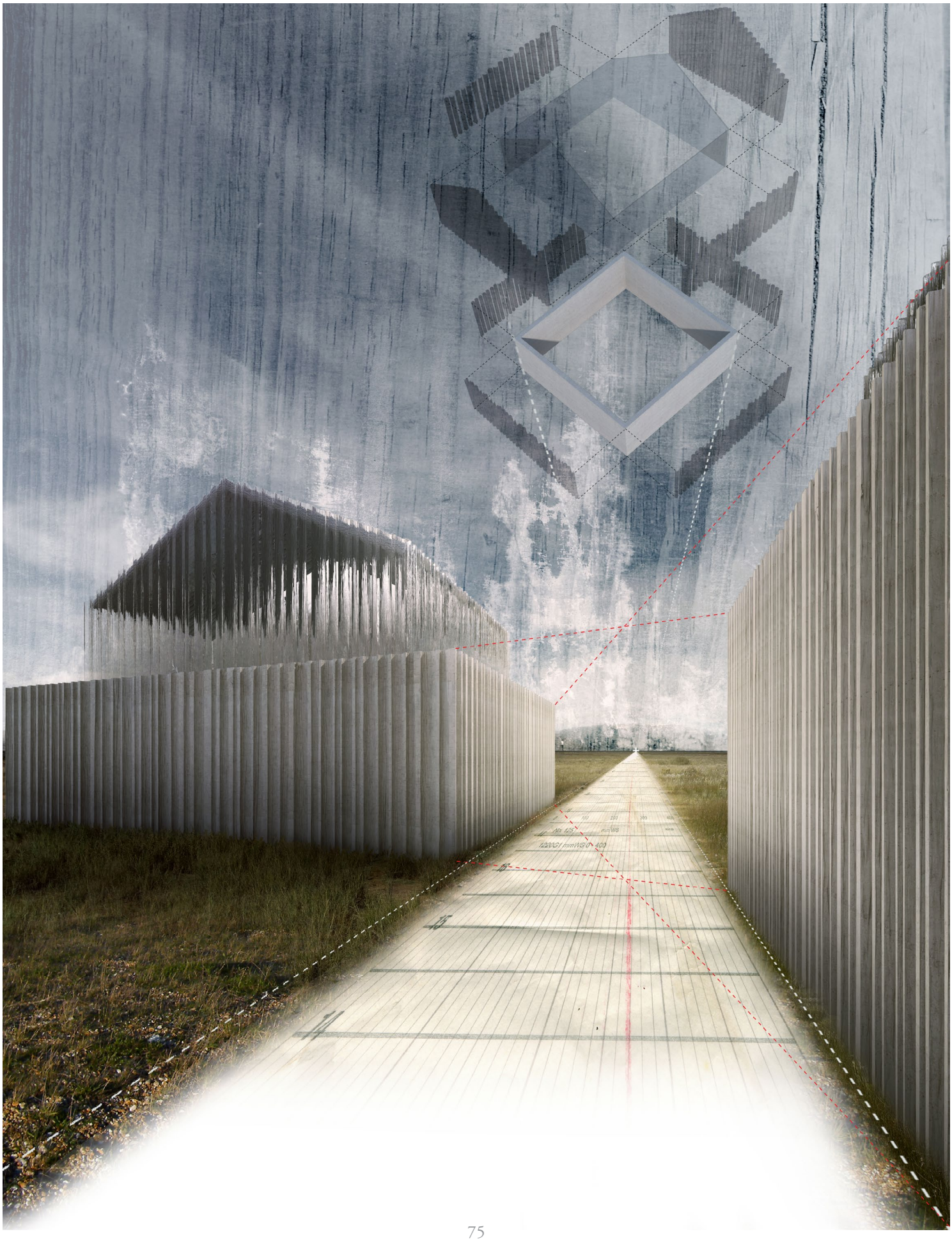
The body's rhythm of movement at the speed of descending stairs is externalized and projected outwards. The heart rate of an individual, projected as voids into the mass of the building, creates calculated and rhythmic striations of light. Between man and man's creation, a synchronistic relationship is created.

opposite
BODY RHYTHM &
CONSTRUCTED RHYTHM
(II)
Figure 1.14, image by author,
digital collage


97 of 100 bpm
98 of 100 bpm
99 of 100 bpm
100 of 100 bpm

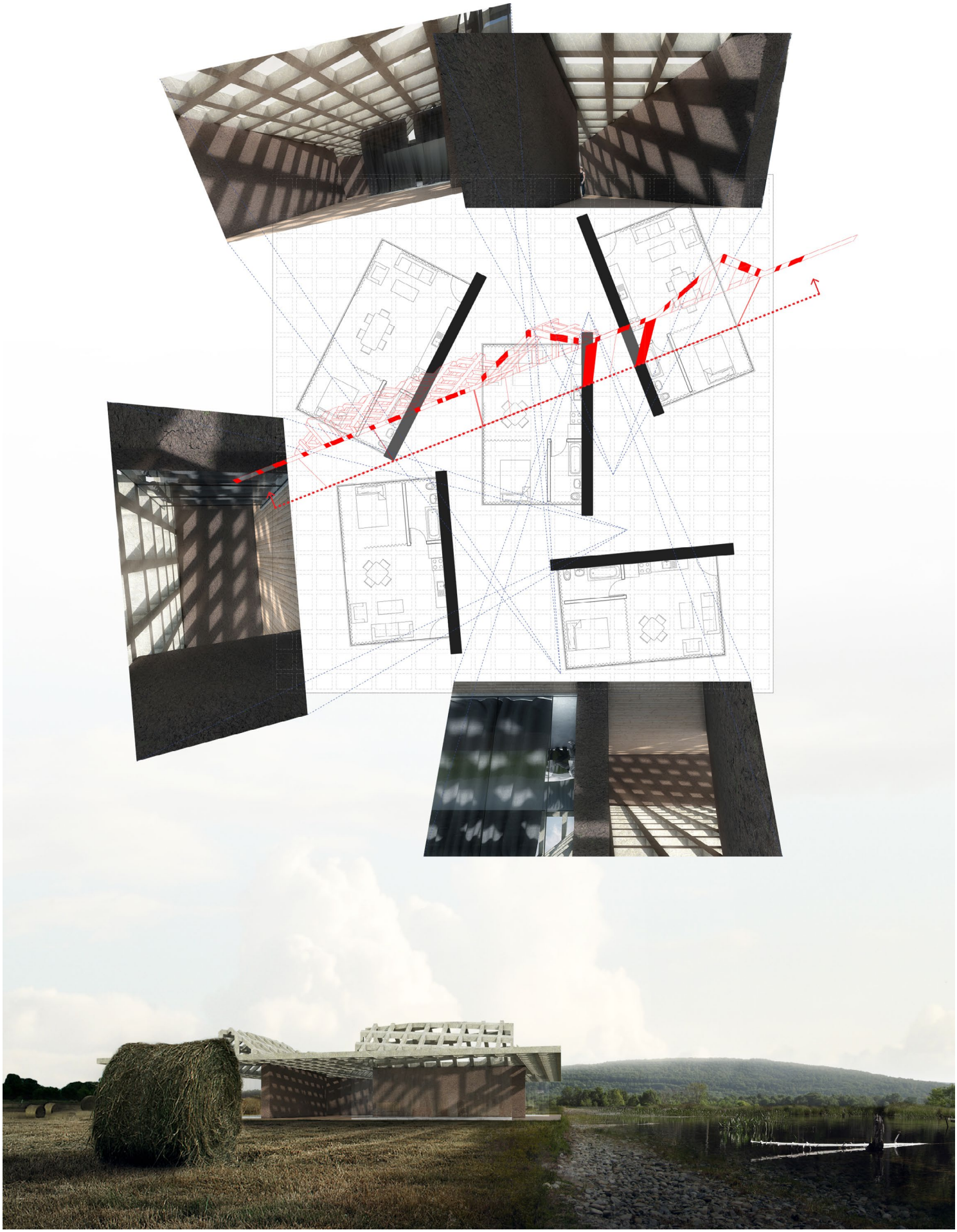
In a deforested area, all that remains of the trees are their embedment into the surface of the materials. Concrete casted around a row of tree trunks creates a solid and vertically striated ground floor, with the negative of the trunks impressed into its surface. The same tree trunks from this process are used in the super-heating of formed glass, creating a more diaphanous repetition of the process on which the glass stands. As a final act, the trunks are fashioned together to become the roof for the setback glass volume.

opposite
LOG CASTED CONCRETE
& LOG FORMED GLASS
Figure 1.15, image by author,
digital collage



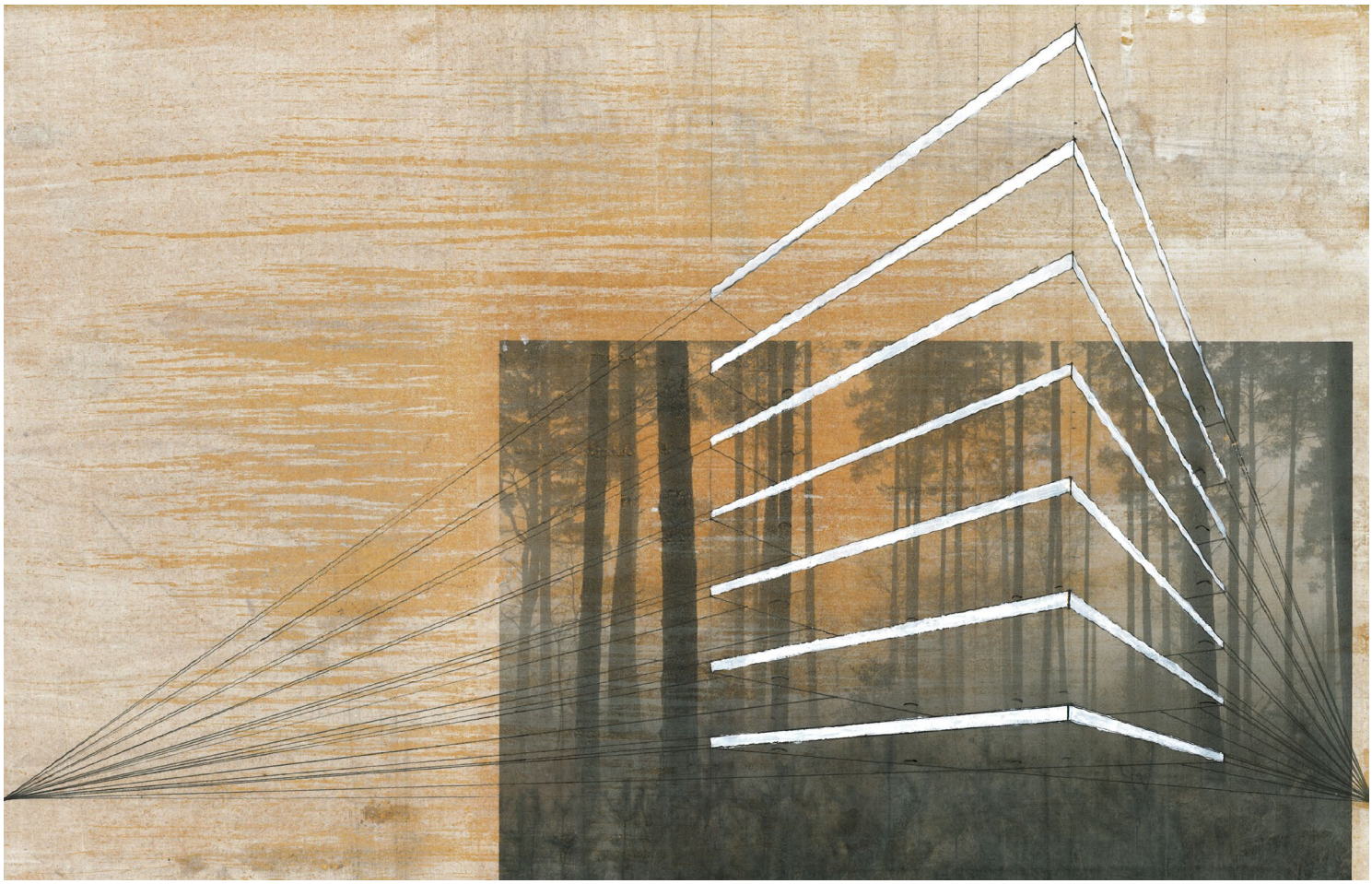
A series of living quarters constructed on a farm, made of hay and mud, sourced from the very field on which it stands.

opposite
OF MUD & HAY
Figure 1.16, image by author,
digital collage



Stacked horizontal platforms, supported atop an infinite field of vertical structures.

opposite
SUSPENDED HORIZONS ON VERTICAL STRUCTURES (I)
Figure 1.17, image by author, photograph transfer on plywood with graphite and acrylic paint

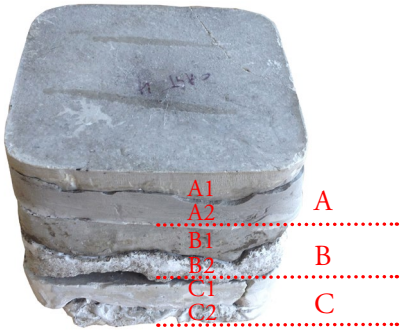


The habitable horizontal platforms are set against the natural vertical structures.

opposite
SUSPENDED HORIZONS ON VERTICAL STRUCTURES (II)
Figure 1.18, image by author, digital collage

An original form is cast and multiplied through a series of negative and positive duplications, blurring the detail and adding surface deformations to the subsequent generation. With each successive cast, the surface is further distanced from the original source.

opposite
CAST-ON-CAST, THE DISAPPEARING INDEX
Figure 1.19, photographs and diagramming by author in collaboration with Mark Kim, rockite and concrete casts



A1

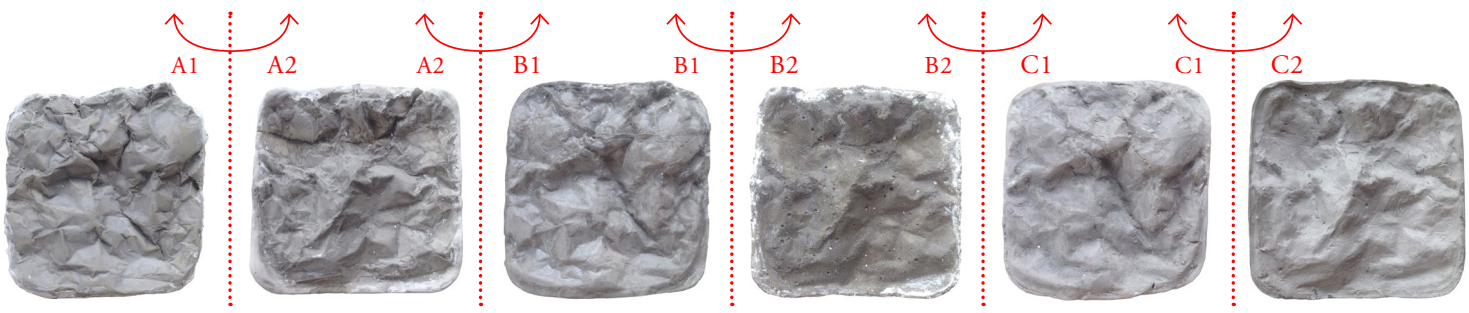
A2

B1

B2

C1

C2



A soft form is sculpted and cast inside a concrete container. As heat is applied, it melts away, leaving behind a negative of its original.

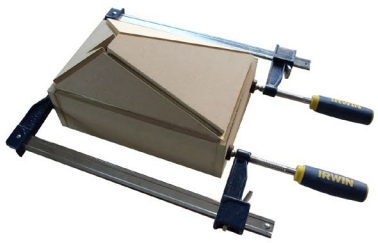
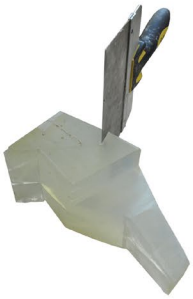
opposite
METAMORPHOSIS OF NEGATIVE SPACE
Figure 1.20, image by author, concrete and glycerin soap





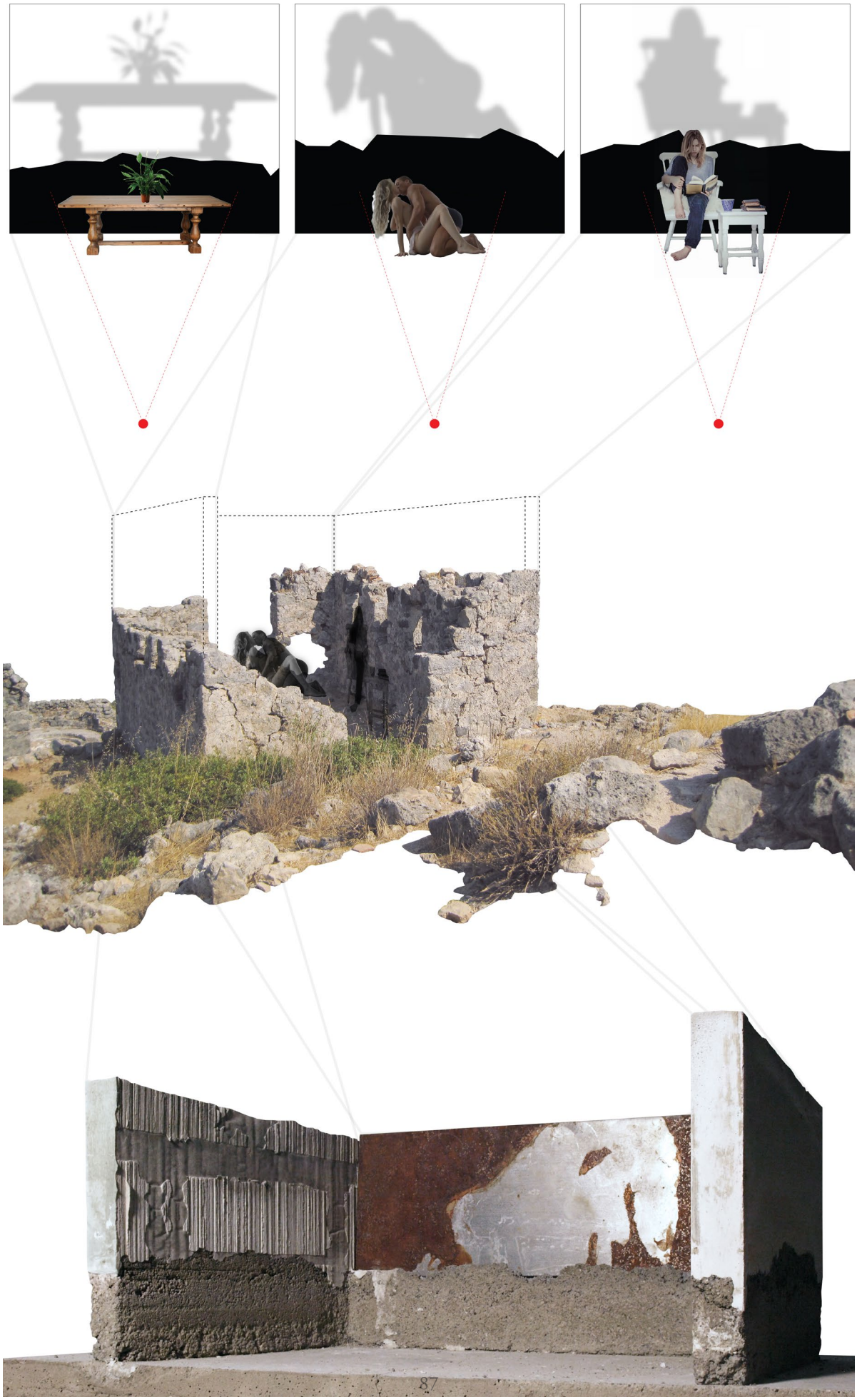






IRWIN



Projecting former acts of domesticity atop a ruin of a home materializes actions once lived, previously existing as a memory.

opposite
MATERIALIZING EMPTINESS, SHADOWS OF FORMER ACTS OF DOMESTICITY
Figure 1.21, image by author, concrete, rockite, weathered steel, digital collage



A structure built next to a stream, the material of which has weathered and been worn by water. The assembled parts spatialize the effects of time.

opposite
SHELTER, WEATHERED BY WATER
Figure 1.22, image by author, stones from a stream, weathered steel, digital collage

Anchored in the constructions that surround it, a floating structure rises from the former city. A fissure splits its mass creating at once a delicate and weighted volume.

opposite
ABOVE AND IN THE CITY
Figure 1.23, image by author, particle board, cast concrete, resin, clay and concrete mixture

- PART 2 -

A 20 000 YEAR STORY

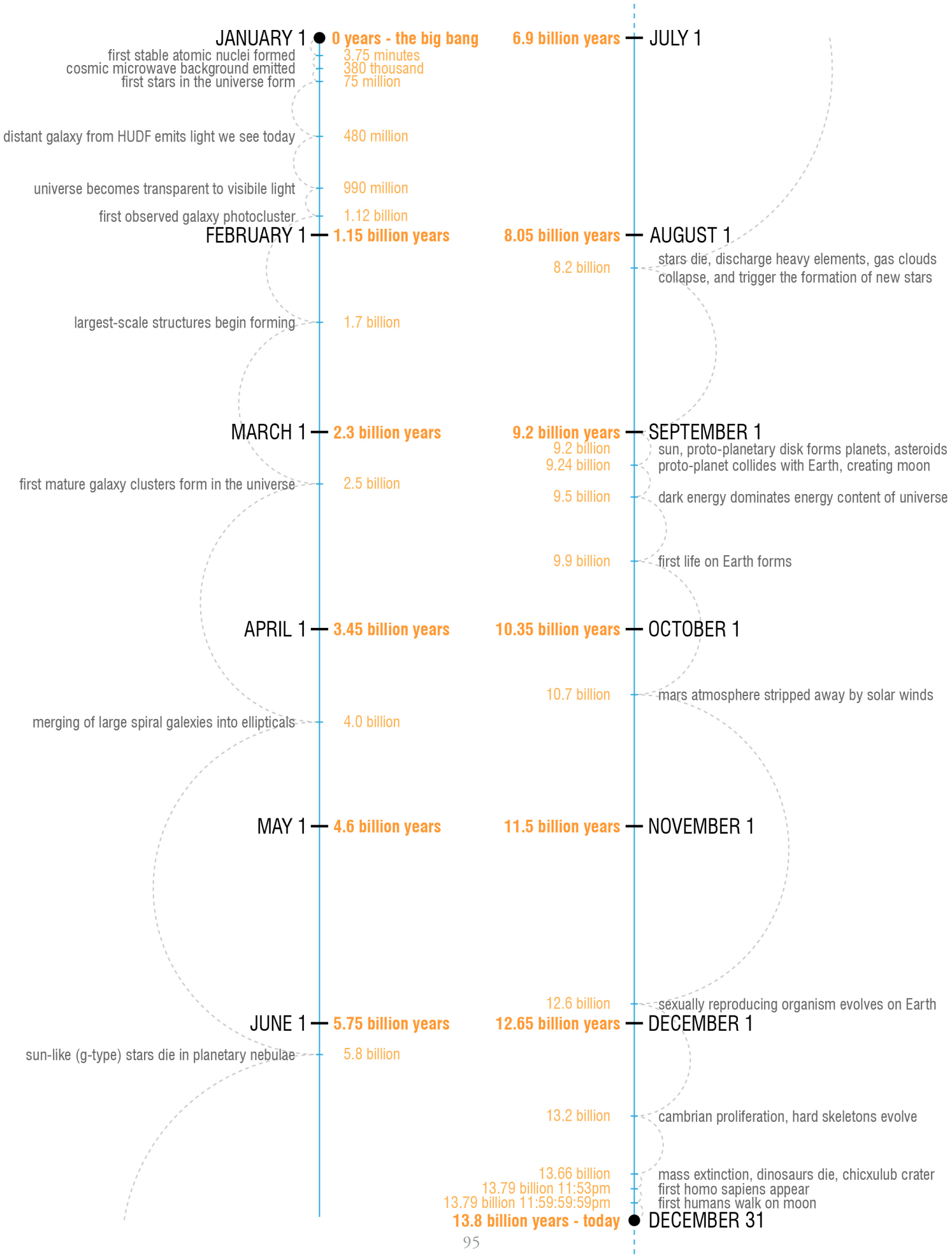
At the end of the last Ice Age is where this 20 000 year story begins. To tell the story of the specific formation of a land, one might argue the need to search further back in time, in order to understand the formation of the earth; the development of pre-Cambrien rock; the eventual transition of *Pangea*[36] due to continental drift; ending where we find present day North America atop the foundations of the Canadian Shield. However, to understand origins how far back must one go? 13.798 billion years ago, before time, space, and the infinitely expanding universe, there was *nothing*[37].

Between *nothing* and 20 000 years prior to this date, the author hopes the reader has brief knowledge of the formative events of the universe and of the earth. When one describes how to craft a table, the instructions do not begin with the planting of a tree. Though perhaps they should.

36. P*angea*: the ancient supercontinent, comprising all the present continents joined, which began to break up about 200 million years ago. "Pangea," *Dictionary.com Unabridged*, Random House, Inc, accessed July 24, 2015, http://dictionary.reference.com/browse/pangea.

37. *nothing*: refers to the definition laid out in the introduction of this thesis describing the term as not being an emptiness or absence of something, but as a state of non-existence.

opposite
FROM THEN TO NOW
Figure 2.1, image by author
*If the timeline of existence for the universe were to be placed into a twelve-month cosmic-calender, an idea posited by Carl Sagan in the Cosmos (1980) series, each month would represent 1.15 billion years.


JANUARY 1
0 years - the big bang
first stable atomic nuclei formed
3.75 minutes
cosmic microwave background emitted
380 thousand
first stars in the universe form
75 million
distant galaxy from HUDF emits light we see today
480 million
universe becomes transparent to visibile light
990 million
first observed galaxy photocluster
1.12 billion
FEBRUARY 1
1.15 billion years
largest-scale structures begin forming
1.7 billion
MARCH 1
2.3 billion years
first mature galaxy clusters form in the universe
2.5 billion
APRIL 1
3.45 billion years
merging of large spiral galexies into ellipticals
4.0 billion
MAY 1
4.6 billion years
JUNE 1
5.75 billion years
sun-like (g-type) stars die in planetary nebulae
5.8 billion
6.9 billion years
JULY 1
8.05 billion years
AUGUST 1
8.2 billion
stars die, discharge heavy elements, gas clouds collapse, and trigger the formation of new stars
9.2 billion years
SEPTEMBER 1
9.2 billion
sun, proto-planetary disk forms planets, asteroids
9.24 billion
proto-planet collides with Earth, creating moon
9.5 billion
dark energy dominates energy content of universe
9.9 billion
first life on Earth forms
10.35 billion years
OCTOBER 1
10.7 billion
mars atmosphere stripped away by solar winds
11.5 billion years
NOVEMBER 1
12.6 billion
sexually reproducing organism evolves on Earth
12.65 billion years
DECEMBER 1
13.2 billion
cambrian proliferation, hard skeletons evolve
13.66 billion
mass extinction, dinosaurs die, chicxulub crater
13.79 billion 11:53pm
first homo sapiens appear
13.79 billion 11:59:59:59pm
first humans walk on moon
13.8 billion years - today
DECEMBER 31

Approximately one million years ago, during the Pleistocene Epoch, or the Great Ice Age, ancient glaciers one kilometer thick spread out and covered most of North America. Brought on by cyclical climactic shifts over long periods, the massive glaciers would retreat from their current position, then in time, advance again at a rate of about one centimeter per day. This cycle of partial melting, shifting, and re-freezing, occurred over a long duration and repeated four times in total. The fourth and final cycle of advance and retreat would have a significant formative impact on Southern Ontario's geological morphology.[38]

This final retreat of a continent-shaping glacier would carve deep into the earth, scarring and penetrating its depth beyond the surface level. The movement, in slow time, would carve out deep valleys and displace large amounts of earth, creating voids that would fill with meltwater from the glacier. These voids, in their primitive shapes, would become the origin of the Great Lakes and their connecting rivers.[39]

38. Walter M. Tovell, *The Niagara River* (Toronto: Royal Ontario Museum, 1979), 14.

39. "Great Lakes Formation," *Michigan Environmental Education Curriculum the Great Lakes Ecosystem*, accessed February 8, 2015, http://techalive.mtu.edu/meec/module08/GreatLakesPastandPresent.htm.

opposite
ANCIENT GLACIERS ACROSS NORTH AMERICA
Figure 2.2, image by author, photograph transfer on wood, oil paint, based on Gerhard Richter's 'overpainted photographs' technique

It wasn't until the late 1800's, thousands of years after its formation, that the origin of the Niagara River would be discovered. During this last recession of vast ice fields, the melted water left trailing behind would become trapped between the higher lands around each of the lake basins and the exterior limits of the glaciers. The repeated melting and re-advancement set in motion a succession of changing lake boundaries with it, altering in addition the rivers that connected them.[40]

The markings left in the earth after the disappearance of the glaciers were of varying depths, causing uneven elevations between the separate lakes. Inconsistent water discharge between the upper lakes and Lake Erie would cause a discrepancy between the volumes of water flowing over the Niagara Escarpment – the original position of the Niagara Falls – and between the Lake Erie and Lake Ontario basins. When these varying flow rates increased or decreased, the sheer power of the water's ability for erosive action on a channel would fluctuate. An index of this varying action during the gorge's developing stages is evident today on the narrow and broad sections of the Niagara Gorge.[41]

40. Walter M. Tovell, *The Niagara River* (Toronto: Royal Ontario Museum, 1979), 14.

41. Ibid.

opposite
NARROWING AND BROADENING OF THE NIAGARA RIVER
Figure 2.3, Google Earth, *Niagara River,* 43°05'57.59"N and 79°03'44.62"W, June 21, 2014, accessed July 21, 2015.

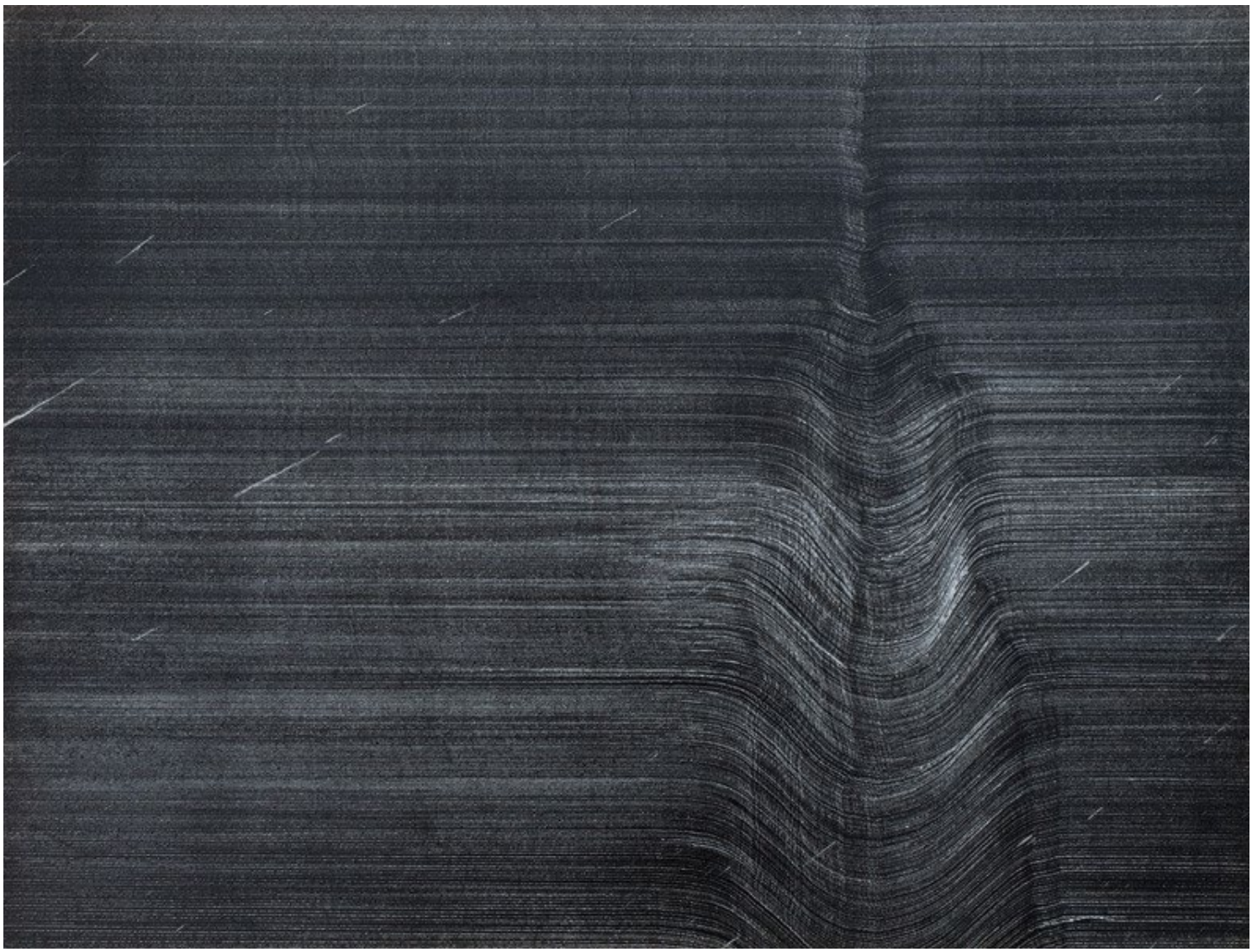
As the glaciers would completely disappear through melting and recession – leaving the now Niagara region uncovered and exposed – a new lake developed between Lake Erie and Lake Ontario, called Lake Tonawanda. Situated a few kilometers south of and parallel to the escarpment, Lake Tonawanda stretched 93km from east to west with an average depth of only about 10m.[42]

Leading from the lake, over the escarpment, and into Lake Ontario there existed at least five tributary spillways. The westernmost spillway, known as the Lewiston Spillway, would remain after the disappearance of the lake itself and the remaining tributaries. Through time, the Lewiston Spillway would become the Niagara River, surviving as the only visible trace of Lake Tonawanda, and ultimately, of the ancient glaciers.

Gradually, the tumultuous waters would erode a channel into the hardened bedrock, forming the gorge, and over time wearing away the falls to a position closer to Lake Erie that can be seen today. The slow erosive action that has displaced the falls from the Niagara Escarpment continues to be worn away, receding further to Lake Erie. To observe the falls in their current position in any period, is to view a continuous and ongoing process, made unaware by the naked eye in the duration of a single day.

42. Walter M. Tovell, *The Niagara River* (Toronto: Royal Ontario Museum, 1979), 14.

opposite
TRACES
Fig. 2.4, Greg Otto, *Francis Frost*, 1971, graphic on paper, 15 ¼ in. x 24 in., accessed July 25, 2015, http://www.francisfrost.com/otto2.html.



During the 17th and 18th centuries, in an era of geological adolescence, many believed that the Niagara Gorge had in fact not formed slowly over many thousands of years, rather from 'terraqueous convulsions' or a single 'revolutionizing struggle' that had taken place in the span of only a month, or perhaps even a day.[43] This dispute outlined the basis of the catastrophism versus uniformitarianism debate.

Catastrophism is the original theory that attempted to explain the formation of the earth, at first aligned with religious creationist's beliefs, as a series of violent and sudden events that affected large areas of the world. Uniformitarianism stands in contrast to this quick and violent action, and outlines a more slow earth-forming process, stretching over vast time scales, caused by such geological events as erosion. Catastrophism can be seen as a more primitive explanation of the formative events of the earth and might be described as *fast* time, whereas uniformitarianism was a scientific update, redefining the theories that were at once thought to be accurate, taking on the properties of *slow* time. Victor Baker in his article entitled *Catastrophism and Uniformitarianism: Logical Roots and Current Relevance in Geology* states, "It is well to remember that all these revelations were achieved not by theoretical elegance in explaining the earth, but by overcoming restrictions posed by existing theories. In their attempts to enshrine fundamental principles for their science, nineteenth century advocates of a 'more scientific' geology confused simplicity of logical expression with intrinsic qualities of nature. The resulting doctrine, named 'uniformitarianism', asserted that the relatively low-intensity, frequently occurring processes in evidence today must be the class of processes generally operating in the past."[44]

43. Walter M. Tovell, *The Niagara River* (Toronto: Royal Ontario Museum, 1979), 5.

44. Victor R. Baker, "Catastrophism and Uniformitarianism: Logical Roots and Current Relevance in Geology," in *Lyell: the Past is the Key to the Present,* ed. D.J. Blundell and A.C. Scott (London: Geological Society, Special Publications, 1998), 173.

opposite
CATASTROPHISM & UNIFORMITARIANISM
Fig. 2.5,
top:
Rachel Johnson, "Noah and the Ark, or Gilgamesh and the Great Flood?," *Rational Avenue*, March 15, 2013, accessed July 21, 2015, http://www.rationalavenue.com/noah-and-the-ark-or-gilgamesh-and-the-great-flood/.
bottom:
"Glen Canyon Revealed," *Uniqueness Nature*, accessed July 21, 2015, http://uniqueness-nature.blogspot.ca/2011/08/this-photo-beautiful-natural-scenery-in.html.

The foundations of modern geology were laid out by James Hutton (1726-1797), whose theories were further refined by John Playfair (1748-1819), to be then popularized by Charles Lyell (1797-1875). Hutton's *Theory of the Earth* (1788) outlines foundational theories in geology:

> The solid parts of the present land appear in general, to have been composed of the productions of the sea, and of other materials similar to those now found upon the shores. Hence we find reason to conclude: *1st*, That the land on which we rest is not simple and original, but that it is a composition, and had been formed by the operation of second causes. *2nd*, That before the present land was made, there had subsisted a world composed of sea and land, in which were tides and currents, with such operations at the bottom of the sea as now take place. And, *Lastly,* That, while the present land was forming at the bottom of the ocean, the former land maintained plants and animals; at least the sea was then inhabited by animals, in a similar manner as it is at present. Hence we are to conclude that the greater part of our land, if not the whole, had been produced by operations natural to this globe: but that in order to make this land a permanent body, resisting the operations of the waters, two things had been required; *1st*, The consolidation of masses formed by collections of loose or incoherent materials; *2ndly*, The elevation of those consolidated masses from the bottom of the sea, the place where they were collected, to the stations in which they now remain above the level of the ocean.[45]

45. G.Y. Craig, *The 1785 Abstract of James Hutton's Theory of the Earth* (Edinburgh: Scottish Academic Press, 1987), 5-7.

opposite
THEORY OF THE EARTH
Fig. 2.6, *Reblot*, accessed August 8, 2014, http://reblot.tumblr.com/.

Lyell's *Principles of Geology* (1830-1833) not only built upon Hutton's theory of the earth and the concept of uniformitarianism, but also acted as an influential precursor to Darwinism. The earth is the *memory* of *time* past, and like a detective, Lyell would use present day observations of the earth as evidence to understand and explain the evolution of the changes that took place in the past. Here, the *effect* is in a sense deconstructed to comprehend the *cause* that occurred many years before. These cycles of *cause* and *effect*, of making and unmaking, of remembering and forgetting, still occur today.

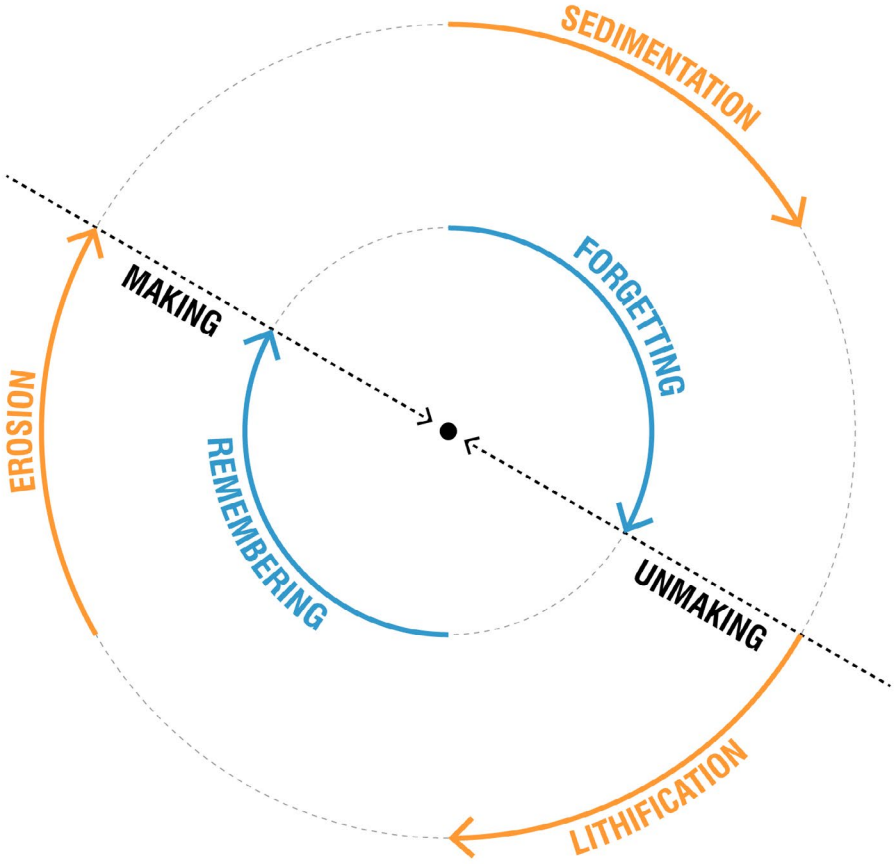
Both Hutton and Lyell defined and redefined the uniformitarianism classification of modern geological theory establishing a contrast to the catastrophism classification. Though uniformitarianism set out to reject the catastrophism theorem of the earth's formation as brief violent periods with much longer periods of calmness between, more contemporary geological theories would recognize and accept that these violent catastrophic actions are actually a part of, and are a result of, the slow processes that classify uniformitarianism. These catastrophic events that occur infrequently, when considering the human time scale of an individual, are in fact a part of the slow processes rumbling underfoot.[46]

It wasn't until 1841 that Charles Lyell would visit Niagara Falls and observe that the exposed rocks along the surface at the falls and along the river are present as a product of the cascading waters eroding the gorge, causing the falls' position to shift from the edge of the escarpment to the position that can be seen today. The slow movement from the escarpment to the present day position left behind traces in the then-newly created boundaries of the river's edge. At the time, this slow movement was believed to have taken 35 000 years; a figure that would be updated as time moved on.[47]

46. Victor R. Baker, "Catastrophism and Uniformitarianism: Logical Roots and Current Relevance in Geology," in *Lyell: the Past is the Key to the Present,* ed. D.J. Blundell and A.C. Scott (London: Geological Society, Special Publications), 173.

47. Walter M. Tovell, *The Niagara River* (Toronto: Royal Ontario Museum, 1979), 6.

opposite
CYCLES OF CHANGE
Fig. 2.7, image by author


SEDIMENTATION
FORGETTING
MAKING
EROSION
REMEMBERING
UNMAKING
LITHIFICATION

The continued erosion of the gorge occurs from the structure of alternating layers of hard and soft rock that forms the boundary walls. Only two types of stratigraphy exist as exposed layers at the edge of the falls, hard rock – Lockport dolostone – and soft rock – Rochester Shale. These alternating layers of hard and soft create a weak structure, as the weight of the Lockport dolostone bears down on the weaker Rochester Shale, creating an imbalanced system waiting to crumble.[48]

Due to the dolostone's material resistance to the effects of the weather's erosive action and the susceptibility of the softer shale lying below, the rim of the escarpment is continuously undermined, resulting in the fragmentation and destruction of the edge – a process known as sapping. The aggregates of the solidified rock break away and lie below in fragments – called talus – waiting to be eroded away, repeating the cycle of erosion, sedimentation, and lithification. As Walter M. Tovell writes in his work entitled *The Niagara River* (1979), "Along the gorge below the falls, the layers of rock underlying the Rochester shale are exposed. Some of the strata are hard and form ledges and cliffs; some are softer and form gentler slopes. At the mouth of the gorge, upstream from Queenston, all the strata of the escarpment are visible. Here it is a simple feat of the imagination to envisage the falls in their original position at the time that they started cutting the gorge."[49]

48. Ibid.

49. Ibid., 7

opposite
HARD AND SOFT ROCK
Fig. 2.8, Henrik Isaksson Garnell, *Untitled*, photograph, accessed July 25, 2015, http://www.thegorgeousdaily.com/henrik-isaksson-garnell/.

The origins of the rocks exposed along both sides of the Niagara Gorge existed as sedimentary particles resting in bodies of water. Through processes of lithification, these loose sedimentary particles fused together to form solid rocks, concretizing vast time scales into the structure of the gorge. Embedded within these layers of formed stratigraphy contain the remains of ancient marine life; fossilizations of an ancient time far beyond our own. The stratigraphy that lines the Niagara Gorge and contains the fossils, are composed of layers of dolostone, limestone, shale, siltstone, and sandstone. The varying layers of aggregate range in colour from red to buff, mottled green to grey, with slightly changing perceptions based on the lighting.[50] Here, there is a direct relationship between the experience of the viewer and the changing environmental lighting.

50. Ibid., 10

opposite
AN INDEX OF ANCIENT MARINE LIFE
Fig. 2.9, image by author, digital collage


Platyceras Niagarense
(Snail)
Camarotoechia Obtusiplicata
(Brachiopod)
Enterolasma Caliculum
(Cup Coral)
Caryocrinus Ornatus
(Sea Lily relative)
Dalmanites Limulurus
(Trilobite)
Favosites Forbesi
(Colonial Coral)

The thickness of the individual strata layers lining the gorge varies along the route of the river. For instance, north of the edge of the escarpment the Queenston shale layer prominently lines either side of the river, but disappears below the Whirlpool Rapids. The topmost Lockport dolostone stratum layer, upon which our feet rest today, is by contrast very thin at the north end of the gorge above Queenston, and thickens to a depth of twenty five meters near the falls. The underlying Rochester shale exists at a constant thickness throughout.

These varying thicknesses are attributed to three different factors. First, in the distance between Queenston and the falls, there exists a vertical dimension difference of 30m, resulting in the water flowing horizontally, as it does, gradually masking the view of strata below its surface level – like a partially sunken ship plunging into the depths of the water. Second, this height difference is exaggerated even further, as the stratum slope southward at a rate of four meters per kilometer, adding to their gradual disappearance below the water's surface. The third and final factor is attributed to the origins of the land's making, as the repeated shifting of the glaciers has caused different erosive patterns on the Lockport dolostone.[51]

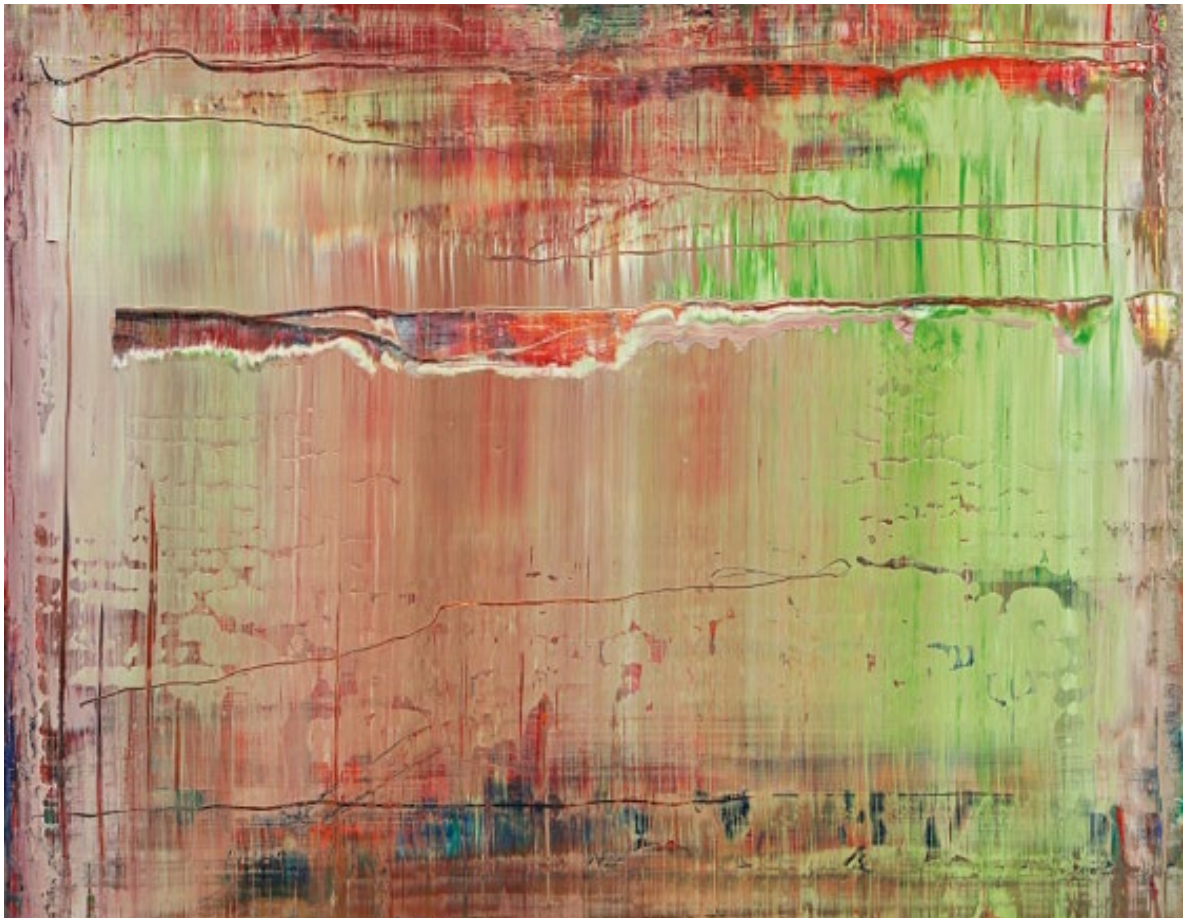
What can be seen today above the surface level of the water is only the Lockport dolostone and Rochester shale, but below these thundering waters lie older formations, invisible to the visitors that pass above it. The plunging water of the falls has begun to slowly excavate the river bottom, burrowing through older formations and into the Queenston shale; nature re-exposing forgotten time.

Charles Lyell and James Hall knew that the rocks exposed along the gorge were older than the river itself. During their era, the science of geology was not yet advanced enough to make an educated guess as to the age of these rocks. They knew however, that these rocks must be, in a way, monuments to time. Today, with many advancements in the field of geology, a hundred years later geologists position the rocks in the Ordovician and Silurian periods, at an age between 450 and 400 million years.[52] The Whirlpool sandstone resting atop the Queenston shale, is a contact between periods spanning seventy million years.

51. Ibid., 11

52. Ibid.

opposite
REVEALING UNDERLYING FORMATIONS
Fig. 2.10, Gerhard Richter, *Abstract Painting 908-9*, 2009, oil on canvas, 60cm x 50cm, Marian Goodman Gallery, New York November 7. 2009 to January 9, 2010, accessed July 25, 2015, https://www.gerhard-richter.com/en/art/paintings/abstracts/abstracts-2005-onwards-69/abstract-painting-14837/?&referer=search&title=908-9&keyword=908-9.



North of the Niagara Falls and just south of the Lower Great Gorge, lies a Whirlpool cut out of the path of the Niagara River. Behind the turning and thrashing water, lies a buried gorge invisible on the surface. Surveying and boring into the ground, the buried St. David Gorge reveals itself as an ancient river once connecting the Whirlpool to Lake Ontario. Through early glacial re-advancment, this path became filled and covered with mud, gravel, and clay. With the final retreat of the ice sheets, the Niagara River carved the gorge back to the Whirlpool, exhumed the Whirpool Rapids Gorge, and cut out the Upper Great Gorge, where the falls exist today.[53]

The movement of water through the Niagara River and into the recessed Whirlpool continues to wear down and extend its boundaries reclaiming visibility of the ancient buried gorge. These slow actions are layered in time creating a cyclical transformation of formation – lithification –, erosion, and sedimentation. "The erosion of the landscape from the coast – by rain and wind – both impresses the land into its shape while simultaneously exposing the layers of geological strata which could identify the history of its making. Naturally, the very same process that gives shape also deforms."[54]

53. Walter M. Tovell, *The Niagara River* (Toronto: Royal Ontario Museum, 1979), 14.

54. Adam Bobbette, "Episodes from a History of Scalelessness: William Jerome Harrison and Geological Photography," in *Architecture in the Anthropocene: Encounters Among Design, Deep Time, Science and Philosophy*, ed. Etienne Turpin (University of Michigan, Ann Arbor: Open Humanities Press, 2013), 56.

opposite
BENEATH THE TORRENT
Fig. 2.11, John Martin, *Manfred and the Alpine Witch*, 1837, watercolour, 388mm x 558mm, Whitworth Art Gallery, accessed July 25, 2015, http://www.artrenewal.org/pages/artist.php?artistid=3357.

The effects of time do not wear away evenly. The falls, like the ancient glaciers scarring the earth, recede as they wear away hardened matter and forge the path of the ever-expanding gorge. The falls become a displaced fragment from the original Niagara Escarpment, leaving behind the gorge as its trace.

Tovell outlines, "Perhaps no other natural phenomenon related to geological events has kindled such consciousness of time as has the recession of the Niagara Falls. The time required for this recession has been guessed, estimated, measured, and deduced, with varying results."[55] The gorge itself can act as a geological clock, indicating a passage of time from its creation and formation to its accumulated transformation throughout the years. However, in order for this to be used as an accurate surveyor of time, the rate of recession of the falls must be determined, through geological surveys of the rim. In the same way a wristwatch to humans is a scientific abstraction registering the physicality of nature, surveying geological time in the earth has a more expanded scope in measuring the duration of existence and formation.

James Hall would be the first to conduct such a survey in 1842, returning thirty three years later in 1875, to establish a projected recession rate based on the changes in that time frame. Since the time of the first surveying, additional measurements have been made to calculate the ever-changing yearly rate of recession: between 1842 and 1875 the falls moved at various rates of 0.61m then 1.2m to 1.34m, between 1905 and 1927 the falls receded 0.70m.[56]

55. Walter M. Tovell, *The Niagara River* (Toronto: Royal Ontario Museum, 1979), 16.

56. Ibid.

opposite
RECESSION & TRAIL
Figure 2.12, image by author, oil paint on wood board with stone

These variable rates are due, in part, to the changing structure and composition of the earth surrounding the Niagara River. The height of the cataract, the width of the river, the thickness of the Lockport dolostone, the variations in the resistance to erosion of the underlying strata, and the volume of water cascading over the falls all affect the recession rates as the falls move further southward.[57]

The volume of water cascading over the falls is difficult to calculate as during the falls' excavation of the gorge through slow but violent action, the volume of water arriving from the upper Great Lakes varied. Through approaching and developing industries – methods of power production changing and encroaching on the land – and the varying rates of erosion on the varying widths of the gorge, the rate of recession would change over the coming years, and will likely do so for years into the future.

The rate of recession is unobservable on a diurnal scale. The constant variation along the length of the gorge, leading to changing recession rates, results in an inconsistent method for measuring the true age for the Niagara Gorge; an extrapolation into the past based on consistent annual data would yield more accurate results. Two distinguished geologists from the early 1900's, F.B. Taylor and E.M. Kindle, proposed that calculating the age of the gorge based on the rate of recession could only give an approximate age of between 10 000 and 50 000 years. In 1931, the conveniently accepted figure for the age of the Niagara Gorge was 25 000 years.[58]

57. Ibid.

58. Ibid., 17

opposite
CHANGE THROUGH TIME
Fig. 2.13, maps stitched by author, Google Earth, *Niagara River,* 43°05'57.59"N and 79°03'44.62"W, June 21, 2014 and July 1, 1934, accessed July 21, 2015.

In 1950, Willard Libby developed a new measuring technique known as radiocarbon (carbon-14) dating. This discovery would lead to a more precise method of determining when the Niagara River came into formation and how long the falls have been receding from their original position above Queenston. With an age restriction of up to 50 000 years, organic matter found in a deposit such as fossil wood, can be dated with a high level of accuracy. Therefore, the age of a whole system can be determined through calculating the age of an organic constituent contained within it – the part relating to the whole.[59]

In 1950, organic material found in three places along the now vanished Lake Iroquois shoreline would shed light on the age of the Niagara Gorge. Material uncovered from excavations for the Hamilton City hall is determined to be approximately 11 510 years old and organic materials extracted from two locations near Lewiston is measured at around 12 660 and 12 080 years old. From these numbers, it is clear to determine that Lake Iroquois was present about 12 000 years ago.[60]

Through consequential logic of the formative events of the Niagara Region, it is clear to understand that the excavation of the Niagara Gorge began when Lake Iroquois occupied the Lake Ontario basin. It can be assumed that this lasted approximately 12 000 years in order for the slow excavation of the gorge and the falls to recede to their current position.

Carbon-14 dating is again used in determining the age of the ancient deposits buried in the stratigraphy of the forgotten St. David Gorge. The extraction of organic matter from a 45.4m deep drill hole north of the Whirlpool is dated near 22 800 years. This date suggests the time during which unconsolidated deposits – loose aggregates, having not yet undergone lithification – filled the St. David Gorge. However, the time at which it began to be re-excavated from the Whirlpool's action is still a matter to be debated.[61]

59. Walter M. Tovell, *The Niagara River* (Toronto: Royal Ontario Museum, 1979), 17.

60. Ibid.

61. Ibid.

opposite
FOSSIL WOOD
Fig. 2.14, "Fossil WoodIMG_0540," *Fossilbeach*, January 18, 2015, accessed July 25, 2015, https://www.fossilbeach.co.uk/?attachment_id=1180.

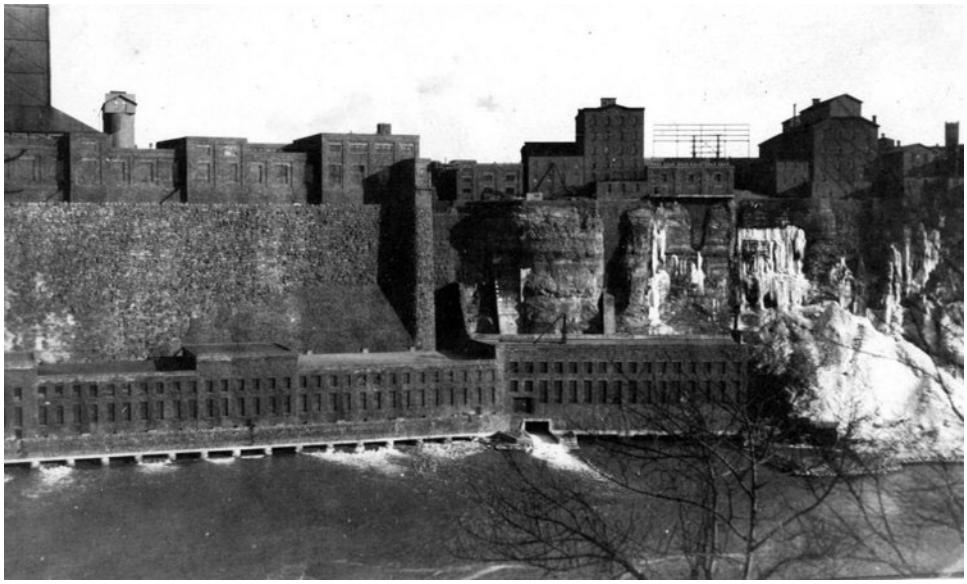
With the arrival of the power industry in Niagara Falls that would utilize the kinetic energy of the water flowing in the Niagara River, the geological traces on the surface remaining as evidence to the formation of the river would again be carved away, this time at the hand of industrial demand. The tourist industry that would result thereafter would again conceal the actions of deep time.

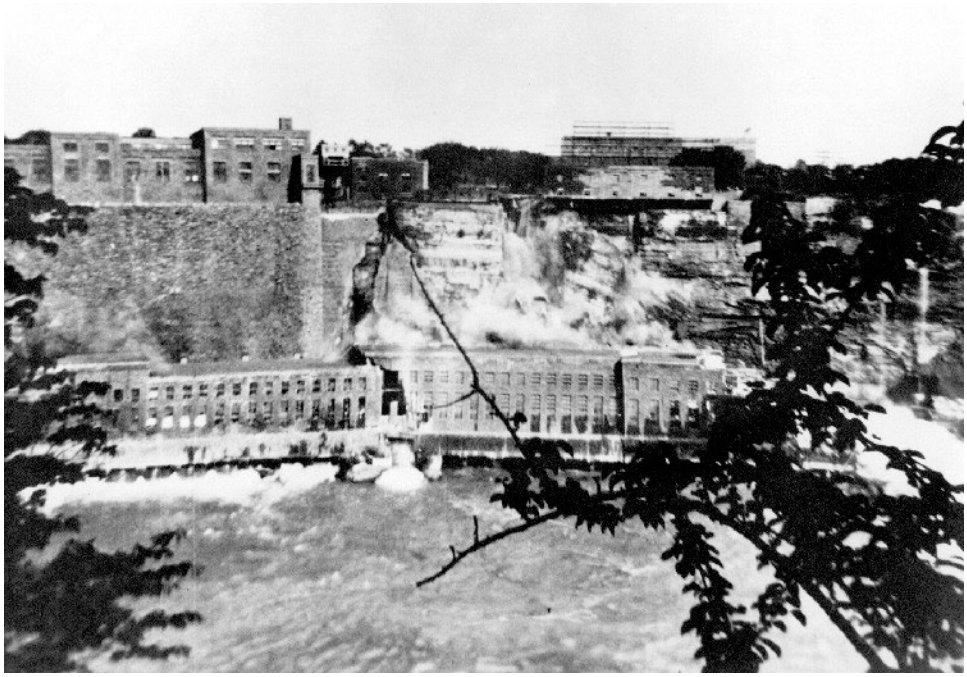
The arrival of power plants and sewage disposal facilities demanded for digging into the earth to create hidden and redirected passages for water and waste. Digging in new areas, samples could be taken and analyzed to continually update and refine the history of the river and develop an increasingly accurate time-analysis of the recession of the falls.

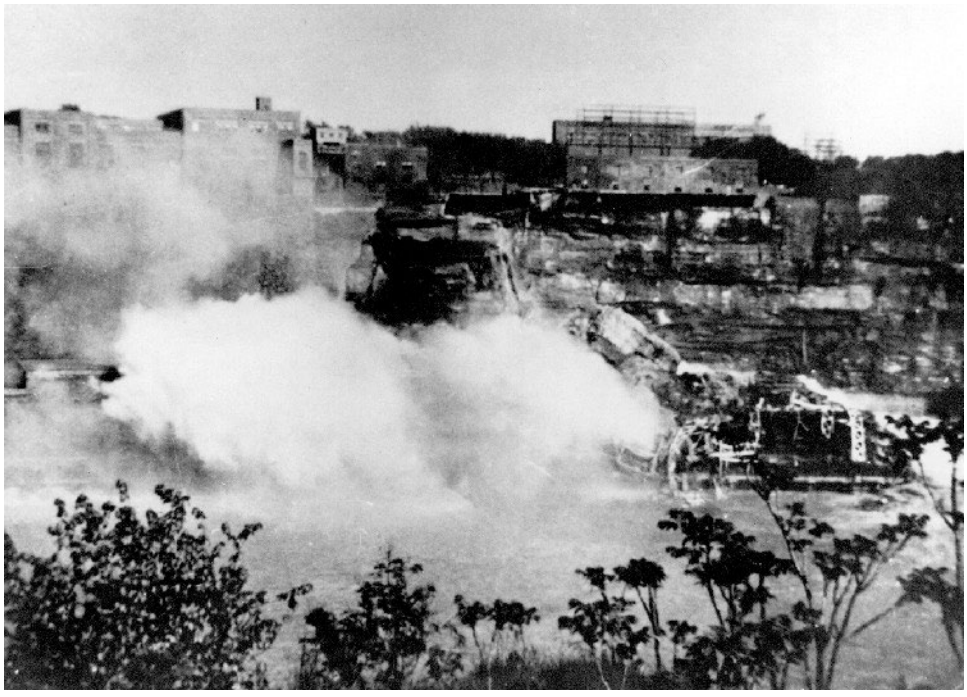
Occurring before the advent of carbon dating and the measuring of the age of particular samples of earth, the natural forces inherent within the Niagara River were beginning to be utilized for the development of electrical power. The Schoellkopf Station, being the first in the area on the American side – an invisible boundary draped across the river, delimiting ownership of land 4.54 billions years old – came in 1882. The limiting factor of this new technology was bound by the direct current (D.C.) transmission, relying on short distances of distribution, rather than province wide distribution utilized today. This hydroelectrically generated power would run sixteen arc lights for the Brush Electric Light and Power Company and demonstrated the ability of water – ancient glacial water – to be harnessed to create electricity for the growing needs of man. The limiting factor, which would later be overcome, was the need to transmit the power to more distant markets.[62]

62. Melanie Battell, *Ontario Power Company Distribution Station* (Niagara Falls: Local Architectural Conservation Advisory Committee, 1998), 3.

opposite
THE COLLAPSE OF THE SCHOELLKOPF POWER STATION
Figure 2.15, three photographs illustrating before and during the collapse,
top:
"Schoellkopf Power Plant," *Niagara Falls Public Library Local History Collection*, 14cm x 8cm, black and white photograph, accessed April 21, 2015, http://www.nflibrary.ca/nfplindex/show.asp?id=280771&b=1.
middle:
"Schoellkopf Power Generating Station Start of Gorge Collapsing Onto the Plant," *Kiwanis Collection*, 10" x 8", black and white photograph, June 7th 1956, accessed April 21, 2015, http://www.nflibrary.ca/nfplindex/show.asp?id=97655&b=1.
bottom:
"Schoellkopf Power Generating Station the Gorge Collapsing Onto the Plant," *Kiwanis Collection*, 10" x 8", black and white photograph, June 7th 1956, accessed April 21, 2015, http://www.nflibrary.ca/nfplindex/show.asp?id=97654&b=1.





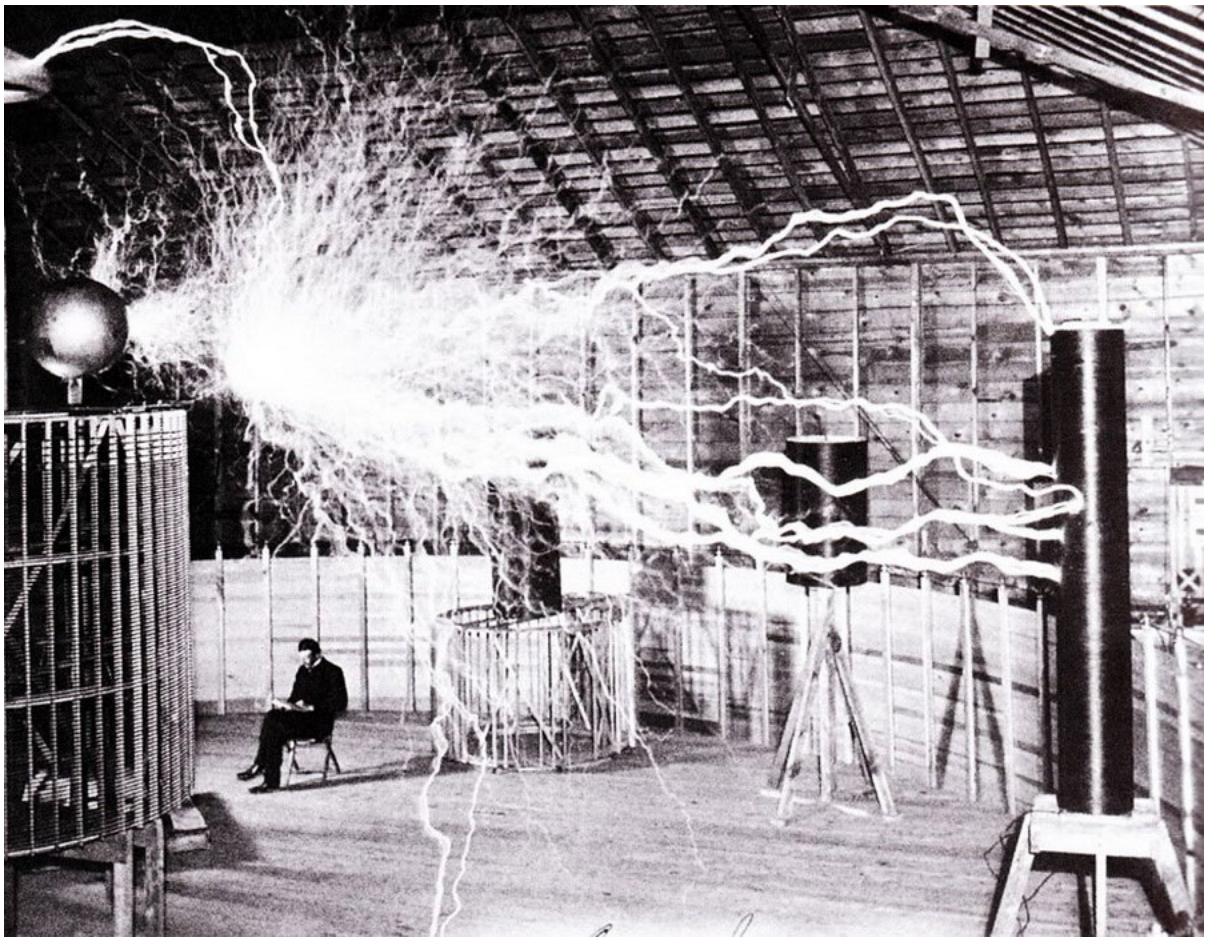


Seven years later in 1889, again on the American side, the Niagara Falls Hydraulic Power Company – known originally as the Niagara River Hydraulic Tunnel, Power, and Sewer Company – was formed in order to establish an industrial town at Niagara Falls. Intending to power the more than 200 mills and factories in a city with a population of only 3 500, and for the proposal to be commercially profitable, a method would need to be devised in order to transmit power to the shipping and industrial centre with a population of 250 000 known as Buffalo, twenty miles away.

To implement a method capable of carrying electricity over such distances, the alternating current (A.C.) method being used in Europe would need to be adopted. The Niagara Falls Hydraulic Power Company would first deliver power to Buffalo in November 15th of 1896; an event that became a catalyst for creating power from water and distributing it over much greater distances, building upon the electrical pioneering of lighting those sixteen arc lights in Schoellkopf Station.[63]

63. Melanie Battell, *Ontario Power Company Distribution Station* (Niagara Falls: Local Architectural Conservation Advisory Committee, 1998), 3.

opposite
TESLA
Figure 2.16, W. Bernard Carlson, *Tesla: Inventor of the Electrical Age* (Princeton University Press, 2013), 290 – 301.



Meanwhile, on the Canadian side, the development of the power industry was delayed due to the Niagara Falls Park Act of 1885, enacted to preserve the natural scenery around the falls, including Queen Victoria Park. In 1887, the Queen Victoria Niagara Falls Park Commission was made into a provincial public corporation. Acquiring the lands that bordered the Niagara River and preserving the beauty of the Falls proved to be an expensive undertaking.[64]

However, with the growing interest of utilizing the Niagara River for hydroelectric production by American companies, the Canadian side could benefit financially; between 1895 and 1905, long-term leases – claiming ownership over the flowing water – for the water rights at the Canadian Falls were granted to three American companies and one Canadian syndicate. The Canadian Niagara Power Company, the Ontario Power Company and the Niagara Falls Park and River Railroad would be American owned, and the Electrical Development Company of Ontario would be the Canadian syndicate. The agreements made in the leases stipulated that each of the companies would be carefully limited to the rates and quantities of water that would be diverted. Additionally, the lease outlined requirements that the architecture of the buildings would need to be constructed to blend into their surroundings and should enhance rather than detract from the natural splendor of the parklands.[65]

64. Ibid.

65. Niagara Society for Industrial History, *The Industrial Archaeology of the Electrical Development Company Generation Station at Niagara Falls* (St. Catharines Museum Lock 3, 1982), 3.

opposite
QUEEN VICTORIA PARK
Figure 2.17,
top:
"Crowds Watching Sports in Queen Victoria Park," *Niagara Parks Commission Photograph Collection*, 1900, Ausgut 8, 2005, accessed July 25, 2015, http://www.nflibrary.ca/nfplindex/show.asp?id=245857&b=1.
bottom:
"Ontario Power Company Generating station – Excavation for Pipe Line in Queen Victoria Park," *Ontario Power Generation Collection,* April 7, 1903, November 26, 2005, accessed July 25, 2015, http://www.nflibrary.ca/nfplindex/show.asp?id=97637&b=1.

The intent of a 'building blending into its surroundings' is a term often repeated in contemporary architecture, so much so that it seems to have lost its meaning. Similarly, 'organic architecture', 'blurring the boundaries between interior and exterior', and 'framing views' are labels given to projects by architects so often that it would seem this has become a fallback for explaining a design approach that perhaps has no true intelligent conceptual idea. Decisions made are not based on a deep exploration of site, culture, use of materials, or of light and shadow; rather these labels attempt to mask, as an afterword, the thoughtlessness and impatience that has plagued the profession by creating architectures of convenience, rather than of investigation and experimentation. These labels, seen as surface rationalizations, do not do as they say, but rather use a term so frequently used in an attempt to group it into a perhaps once relevant architecture.

What can be observed today of the Power Generating Station, sitting near the base of the falls, is a building that appears almost indiscernible from the strata in the background cliffs in which it is anchored, both in terms of immensity and the aesthetics of natural processes. The commission's stipulation of the building's requirement to 'blend' has today been pushed even further, perhaps beyond their anticipated intention as the uncontrollable cycles of nature have had their effect over time. Decommissioned and abandoned, the building is no longer in operation due to demands for tourism and larger power production facilities prevailing, creating a technological obsolescence. The history of the industry has largely been rendered invisible.

opposite
NATURE RECLAIMS
Fig. 2.18,
left:
Norman S. Smith, "Ice Jam Engulfs Ontario Power Company," *General Photograph Collection*, January 29, 1938, last modified March 13, 2014, accessed April 21, 2015, http://www.nflibrary.ca/nfplindex/show.asp?id=401634&b=1.
right:
photograph by author

Limiting the rates and quantity of water to be diverted would allow the natural processes to continue, as best as possible, unimpeded as has been occurring for thousands of years. Restricting the natural flows of the water and diverting them from their original course, would slow the erosive action present within the Niagara River and detract from the natural beauty and volume of the thundering waters from the falls. Without regulation, the recession of the falls over 12 000 years from the Niagara Escarpment edge would almost grind to an already imperceptible halt, prohibiting the falls to continue their journey of carving out the gorge.

The engineers of the Ontario Power Company, Paul N. Nunn, Lucien L. Nunn, V.G. Converse and Charles H. Mitchell, designed a hydroelectric power station different from the smaller and more compact stations of its predecessors by the Canadian Niagara Power Company and the Electrical Development Company. The distribution, spillway, and generating operations were all housed in separate buildings, starting in the park, on top of the cliff, and at the base of cliff standing almost in the water. The buildings appear to stand in isolation from each other, while linked belowground through a series of massive tunnels for the movement of water and the resulting electricity.[66]

66. Niagara Society for Industrial History, *The Industrial Archaeology of the Electrical Development Company Generation Station at Niagara Falls* (St. Catharines Museum Lock 3, 1982), 4.

opposite
SUB-LEVEL LINKS
Fig. 2.19, Michael Cook, "No. 1 Distributor," *The Ontario Generating Station: A Building 'of Modest Though Massive Design,* last modified August 29, 2007, accessed http://www.vanishingpoint.ca/ontario-generating-station.

As Michael Cook notes in his article entitled *The Ontario Generating Station: A building 'of modest though massive design'*, while the building in its day was comparatively larger than the smaller power production facilities that had come before it in the Niagara Falls area, the later move to public power ownership would out-power the capabilities of this generating station. Cook outlines, "While they were impressive engineering and commercial achievements, the subsequent move to public power ownership ensured that these stations were doomed to be subsumed as minor elements of provincial and state utility systems that for the next 75 years devoted themselves to expanding demand and production to levels that dwarfed the capacity of these older plants. Institutionally irrelevant, these plants stayed operational as long as they did thanks only to water rights that were legally vested in the individual facilities."[67]

67. Michael Cook, "The Ontario Generating Station: A building 'of Modest Though Massive Design,'" *The Vanishing Point*, last modified August 29. 2007, accessed July 21, 2015, http://vanishingpoint.ca/ontario-generating-station.

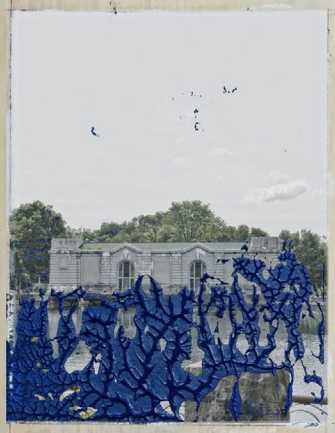
opposite
INDUSTRY EXPANSION
Fig. 2.20, Donnelly, C. Richard, "Pumped Power – Future Hope?" *Canadian Consulting Engineer*, accessed July 25, 2015, http://www.canadianconsultingengineer.com/features/pumped-power-future-hope/.

The production of hydroelectric power for the Ontario Power Company depended on a set of buildings and its constituent parts to be spread along the Niagara River, designed by Buffalo architect Edward Brodhead Green Sr. The screen house, intake pipes, and the gate house were located south of the main generating station building, above the falls At Dufferin Islands.

The gate house controls the intake of water at a depth that avoids the large sheets of ice that accumulate on top of the water. From here, the water is carried 1.8km through three conduits – which have since been sealed off with concrete – towards the surge tower and spillway, where the water then makes an almost vertical drop into the generating station. The distributing station, now demolished, sits 76m vertical of the generating station and 168m horizontal from the edge of the cliff. During its operation, it contained the transformers, high-tension switches, controlling apparatus, offices, and boardrooms of the company. It is here where the power generated from the generating station below the cliff would be carried, to then be distributed. The main building sits at the base of the gorge below the falls – nearly on the water – using the diverted water to generate electricity. Within the generating station, large turbines and generators use the force of the water to produce energy through horizontal shafts, with excess water spilling out the front of the building back into the river, while the power is carried up the cliff to the distribution station.[68]

68. Ibid.

opposite
WATER JOURNEY
Fig. 2.21, photographs transferred on plywood with oil paint



The production of power relies on the successful operation of each of the buildings erected on the landscape, as the water thunders below, moving between the buildings and generating power carried under the cliff to the distribution station. Water is first diverted from its natural course along the Niagara River, and is dropped through the gatehouse into one of the three distributor tunnels. Each of the three distributors, built in succession, are a collage of materials composed underground, as a result of material availability and trial and error from the construction of the preceding distributor.

The first distributor is composed of tens of thousands of curved steel plates riveted together and encased in concrete. Although designed to withstand the internal pressure of the vast volumes of water moving through it, a portion of the tunnel collapsed under a partial vacuum after the conduit had been drained for inspection. Later, the distributor would be repaired with further reinforcements. The second distributor is made almost entirely of reinforced concrete, except where it meets with the penstocks, changing to a structure of steel plates. The third and smaller distributor was constructed later after the First World War, made of wood staves and steel bands due to material shortages, later to be reinforced with concrete. This third distributor would eventually be converted from a conduit to carry water for power production, into a vessel for park irrigation after one of the generators contained within the generating station exploded and was subsequently removed.[69]

69. Ibid.

opposite
1.6km CONDUITS
Fig. 2.22, digital collage and image manipulation by author, top:
Google Earth, *Niagara River,* 43°05'57.59"N and 79°03'44.62"W, June 21, 2014, accessed July 21, 2015.
bottom:
"Construction at the Ontario Power Company," *Francis J. Petrie Collection*, 1905, last modified May 7, 2004, accessed July 22, 2015, http://www.nflibrary.ca/nfplindex/show.asp?id=101687&b=1.

These three conduits, stretching 1.8km, run north along the river to an area directly above the generating station at the top of the gorge, just below the surface. It is here that the water would plunge 55m through steel penstocks and rush towards the station's turbines. Excess water traveling through the distributors overflows upwards through pipes into the surge tower and drains into the river below through helical spillways that emerge through the front of the building via the concrete draft walls. The distributors, each with their own surge tanks, today have either been retrofitted or removed entirely. Surge tank one and two remain in the park as open-topped structures and are used as a base for the lights that illuminate the falls at night. The third surge tank has been demolished after the decommissioning of its generating units.[70]

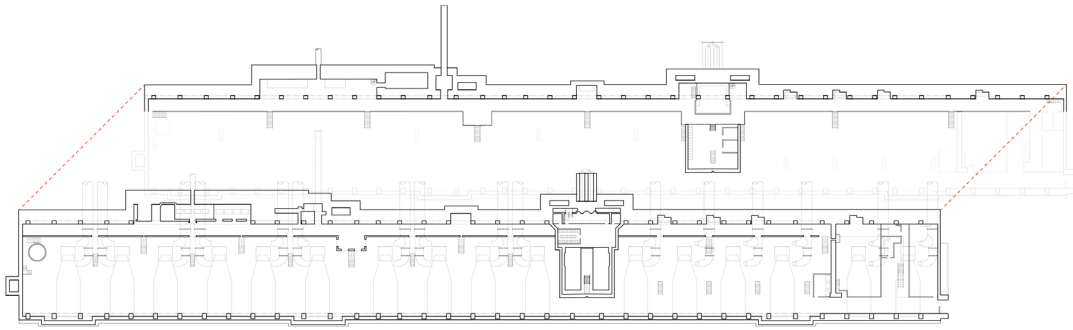
70. Michael Cook, "The Ontario Generating Station: A building 'of Modest Though Massive Design,'" *The Vanishing Point*, last modified August 29. 2007, accessed July 21, 2015, http://vanishingpoint.ca/ontario-generating-station.

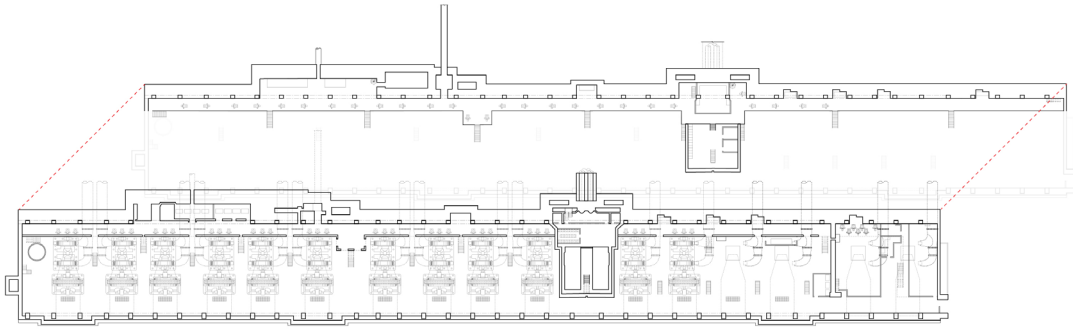
opposite
EXPELLED WATER
Fig. 2.23, Jon Braley, *Untitled Blue*, 2010, mixed paint & resin on board, 50cm x 50cm, accessed July 25, 2015, http://cargocollective.com/jonbraley/recent.

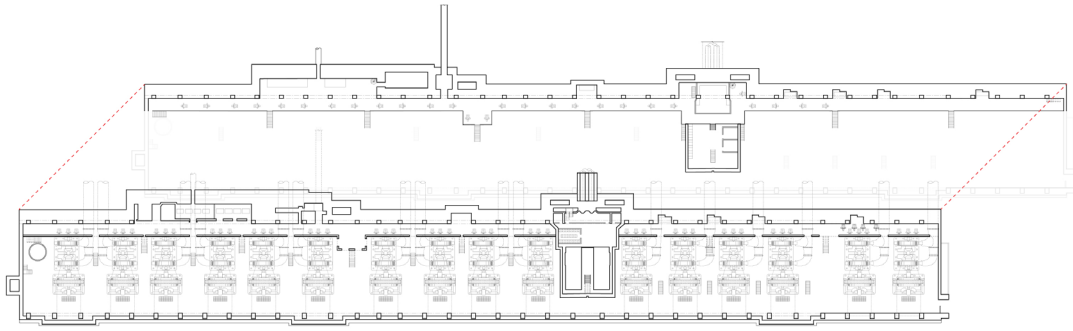
From the 55m drop, the force of the water spins the turbines and creates power through the twelve to sixteen generators existing between 1905 and 1967, before the sixteenth generator was removed in 1922 and the thirteenth to fifteenth removed in 1967. The remaining generators would be removed shortly before 2006.[71] Once the water passes through the turbines – while remaining physically unchanged – it is expelled through the discharge bays at the front of the building.

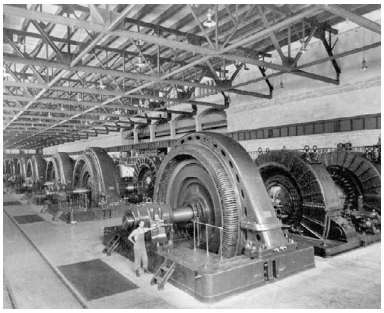
71. Ontario Heritage Trust and McGillivray Architect & Wendy Shearer Landscape Architect Limited, *The Electrical Development Company Generating Station, The Ontario Power Generating Station and Gatehouse and The Canadian Niagara Power Generating Station: Cultural Heritage Assessment*, (Toronto: Queen's Printer for Ontario, 2006), 9.

opposite
TRANSFORMATIONS THROUGH 1905, 1967, 2006
Fig. 2.24
All drawings created by author based on .pdf files received from McGillivray Architect (Toronto), created by Ontario Power Generation.
top photo:
Jonathan Castellino, "An Uncertain Future for the Ontario Power Company Plant," blogTO, December 4, 2009, accessed July 22, 2015, http://www.blogto.com/city/2009/12/an_uncertain_future_for_the_ontario_power_company_plant/.
middle photo:
LaZiguezon, "Five Abandoned Places," *Crasstalk* (blog), February 12, 2012, accessed July 22, 2015, http://crasstalk.com/2012/02/five-abandoned-places-6/.
bottom photo:
"Ontario Power Company Generating Station – Interior – Ten Units Installed," *Kiwanis Collection*, October, 1912, last modified November 1, 2004, accessed July, 2015, http://www.nflibrary.ca/nfplindex/show.asp?id=97633&b=1.









The generating building itself, resembling some of the architectonics of an Egyptian temple, contains within it only the core components necessary for its function. Serving more as an industrial machine, the executive offices were instead contained within the distribution building set back from the gorge. The distribution building has since been removed, where erected on top of its demolished foundations stands the Fallsview Casino, reflecting the very shift in focus of the Niagara Falls area.[72]

72. Michael Cook, "The Ontario Generating Station: A building 'of Modest Though Massive Design,'" *The Vanishing Point*, last modified August 29. 2007, accessed July 21, 2015, http://vanishingpoint.ca/ontario-generating-station.

opposite
LAYERED INDUSTRY
Fig. 2.25, photograph by author

The rigidity of this long and narrow generation station has twice been tested during its operation when floods of ice accumulating on the river crashed into the building filling the space between the massive walls and generators. Only minor damages occurred and the building was quickly returned to its original function.

opposite
ICE INFILTRATION
Fig. 2.26,
top:
Norman S. Smith, "Ice Conditions at the Ontario Power Company," *Niagara Falls Public Library Digital Collection*, 1922, last modified July 9, 2003, accessed July 22, 2015, http://www.nflibrary.ca/nflibrary/show.asp?id=91239&b=1.
bottom:
Norman S. Smith, "Ice Conditions at the Ontario Power Company," *Niagara Falls Public Library Digital Collection*, January 29, 1938, last modified July 9, 2003, accessed July 22, 2015, http://www.nflibrary.ca/nflibrary/show.asp?id=91238&b=1.

Buried underground, amongst the narrowing tunnels focusing water through the turbines, exist a series of sublevel chambers housing the mechanisms that control the water flow from the distributor conduits to each penstock. Smaller cable tunnels connect from this building up to the distribution building sitting high above. From there the electricity is distributed through much of Western New York, and later in the life of the building, to the expanding electrical grid of Ontario. A series of personnel tunnels and elevators permit underground access between these buildings, burrowing through the hardened rock that composes the cliff.[73]

73. Michael Cook, "The Ontario Generating Station: A building 'of Modest Though Massive Design,'" *The Vanishing Point*, last modified August 29. 2007, accessed July 21, 2015, http://vanishingpoint.ca/ontario-generating-station.

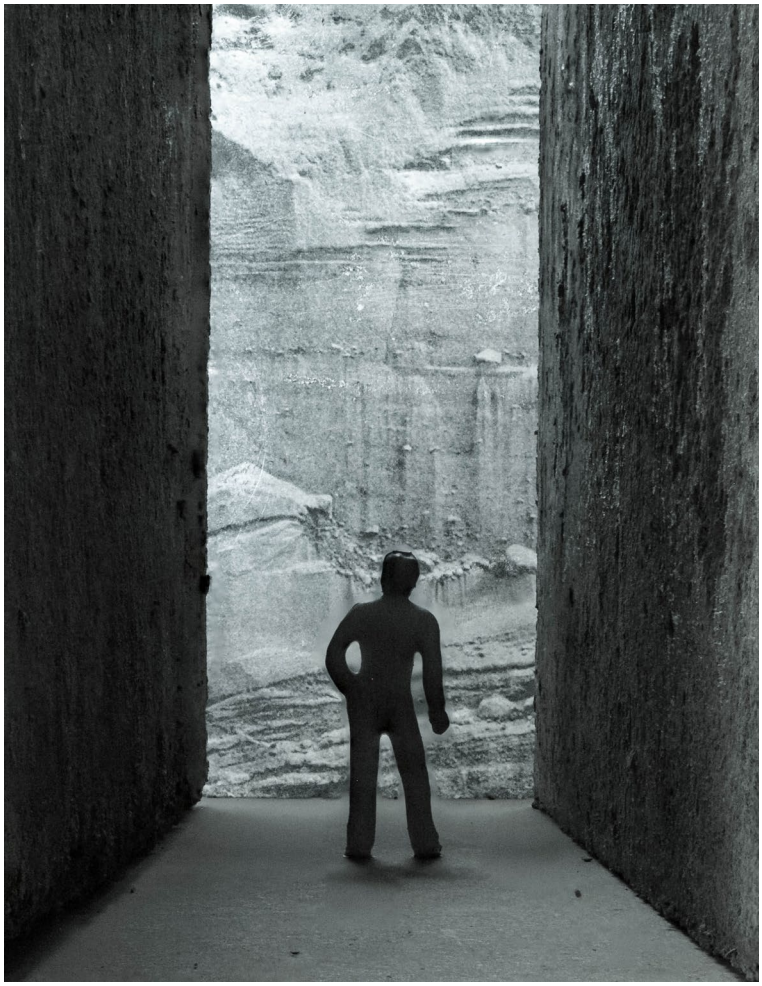
opposite
EXISTING ACCESS THROUGH CLIFF
Fig. 2.27, Ibid.

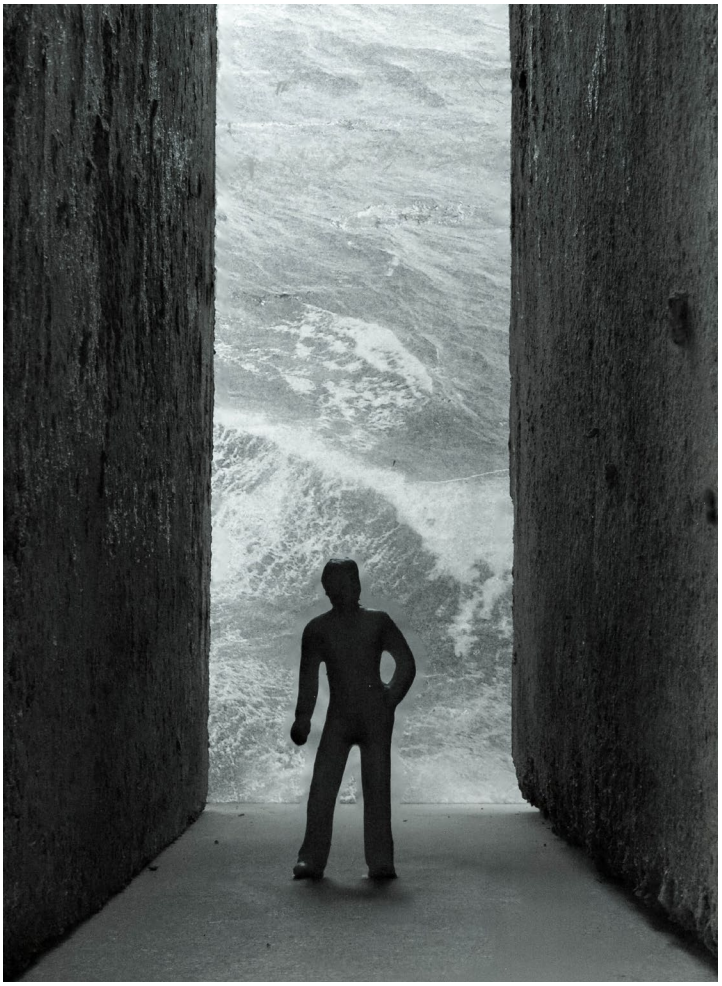
The original engineer Paul N. Nunn describes the building as, "a long but unobtrusive building, its farther end obscured by spray from the great cataract. It is of the modest though massive design and its colours almost blend with those of the overhanging cliff."[74]

The site of this now abandoned building, having been handed over to the Niagara Parks Commission in 2006, is located at the very intersection of both slow and fast time. The cliffs as a backdrop, are formed slowly and accumulatively through the billions of years of the earth's making, with the receding of the falls slowly unmaking and exposing its face over a period of thousand years. The water that quickly passes before the building erodes away the natural stone foundations on which the building rests; a process of shaping and deforming, making and unmaking.

74. P. N. Nunn, *The Development of the Ontario Power Company* (Niagara Falls: The Ontario Power Co., 1905), 5.

opposite:
BETWEEN SLOW AND FAST TIME; BETWEEN FORMATION, TRANSFORMATION, AND EXPERIENCE
Figure 2.28, photographs by author, concrete walls, image transfer on plexliglass, 1:50 figure





Without any future plans laid out by the Niagara Parks Department and a cultural heritage assessment made by McGillivray Architects revealing only minor structural and ornamental damages, this beautiful building sits at the base of the cliff, continuing to become overgrown as if returning to the earth. Standing as an icon to an industry that is continuously modernized and refined, the Ontario Power Generating Station that was once a titan of industry has now become obsolete. It remains hidden and indifferent to the tourists that pass above it, visiting the casinos, hotels, and other immediately gratifying attractions nearby.

opposite:
FORGOTTEN INDUSTRY
Figure 2.29, photograph by author

No other programme than the Long Now Foundation would be a more suitable proposal for this abandoned building and the core themes of the thesis the author has attempted to explore. The foundation itself acts as a kind of research facility and library of history in order to guide thinking about the future.

Established in 1996 by Stewart Brand and Danny Hillis, the Long Now Foundation is located in San Francisco and is perhaps best known for its 10 000 year clock design that is being constructed inside a mountain in the Sierra Diablo range of West Texas. The design of this clock arose out of the observations made by Stewart Brand and Danny Hillis about the trends of our contemporary society, "Civilization is revving itself into a pathologically short attention span. The trend might be coming from the acceleration of technology, the short-horizon perspective of market-driven economics, the next-election perspective of democracies, or the distractions of personal multi-tasking. […] Some sort of balancing corrective to the short-sightedness is needed – some mechanism or myth which encourages the long view and the taking of long-term responsibility, where 'long-term' is measured at least in centuries."[75]

As science-fiction writer Olaf Stapledon states in the preface of his book *Last and First Men* (1934), on writing about the future,

> To romance of the future may seem to be indulgence in ungoverned speculation for the sake of the marvelous. Yet controlled imagination in this sphere can be a very valuable exercise for minds bewildered about the present and its potentialities. To-day we should welcome, and even study, every serious attempt to envisage the future of our race; not merely in order to grasp the very diverse and often tragic possibilities that confront us, but also that we may familiarize ourselves with the certainty that many of our most cherished ideals would seem puerile to more developed minds. To romance of the far future, then, is to attempt to see the human race in its cosmic setting, and to mould our hearts to entertain new values.[76]

75. Stewart Brand, "About Long Now," *the Long Now Foundation*, accessed July 22, 2015, http://longnow.org/about/.

76. Olaf Stapledon, *Last and First Men* (London: Methuen & Co. ltd., 1934), v.

opposite:
LONG NOW FOUNDATION MEMBERSHIP
Figure 2.30, photograph by author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This sense of long-term thinking is demonstrated in the natural world, and observed in the account of the 20 000 year formation of the Niagara Gorge. Long term thinking when framed through the eyes of the earth, can be seen as natural processes creeping before us; through the eyes of the building, where use, materials, and experience transform in time; and through the eyes of the Long Now Foundation, where new earth constructions and archival projects attempt to alter this sole focus on the present, to a more comprehensive awareness of time and our surroundings.

In the reading and comprehension of that which we are presented with, specifically when speaking of the city, Christine Boyer notes in her book *The City of Collective Memory: Its Historical Imagery and Architectural Entertainments* (1994), "to read across and through different layers and strata of the city requires that spectators establish a constant play between surface and deep structured forms, between purely visible and intuitive or evocative allusions."[77] A successful reading and comprehension of experience becomes a balance between the direct encounter – often activated further by the engagement of all our senses beyond just the visual – and the mental transportation that occurs to a time other than the present.

77. M. Christine Boyer, *The city of Collective Memory: Its Historical Imagery and Architectural Entertainments* (Cambridge, Masachusetts: MIT Press, 1994), 21.

opposite:
SURFACE AND DEPTH
Figure 2.31,
top:
Mark Klett and Byron Wolfe, *Panorama from Yavapai Point*, 2007, digital inkjet print, 36 in. x 88 in., accessed July 25, http://www.klettandwolfe.com/.
bottom:
Sergey Larenkov, "Königsberg 1945 - Kaliningrad, 2013. April 9 69th anniversary of the capture of Koenigsberg," *Sergey Larenkov Live Journal*, April 9, 2014, accessed July 25, 2015, http://sergey-larenkov.livejournal.com/?skip=20.


sergey-larenkov.livejournal.com

What follows is a re-use proposal to house the Long Now Foundation with organizational, experiential, and material concepts rooted in the findings of the investigation of site. The specific programme for the Long Now Foundation does not dominate the space. Rather the history, context, memory, and materiality shape the experience of the space with the programmed spaces merely operating between the resultant forms.

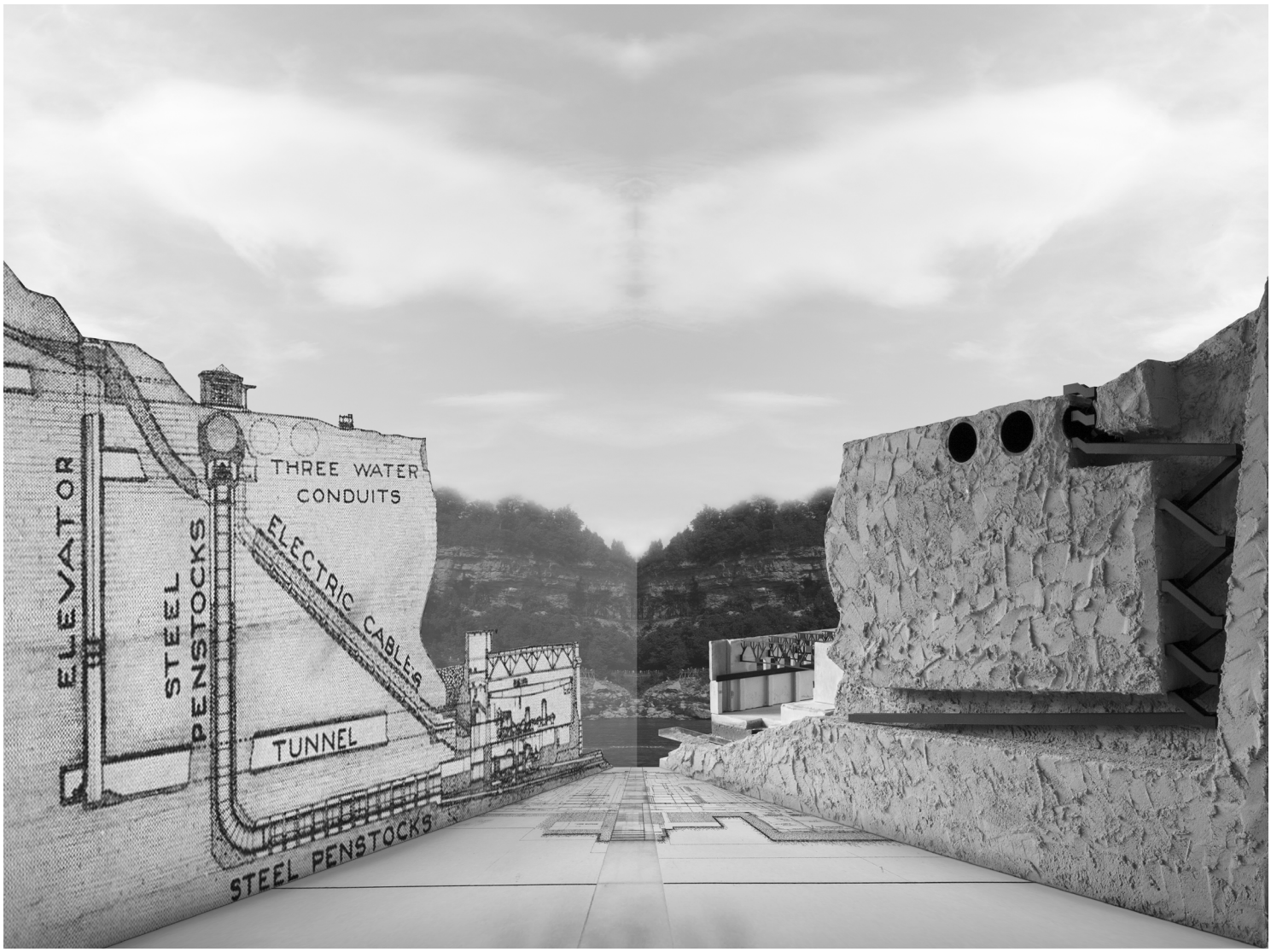
The design proposal is presented as a body of work consisting of photographs, models, drawings, and collages revealed as fragments, with each different concept represented in one single image. Maintaining the same level of detail as the autonomous works leading up to these pages, the focus of the work is on the conceptual ideas, rather than coming to a fully developed resolution and drawing set. Exploring the intractability of time across vast and various temporal frameworks, the works exist as a series of possibilities, scenarios, and operations for spaces related to the work of the Long Now Foundation – setting a stage for activities in deep time to unfold.

opposite:
STUDIES SHAPED BY THE SITE
Figure 2.32, Colleen Corradi Brannigan, *Zora*, 2004, oil and acrylic, 100cm x 100cm, accessed July 25, 2015, http://www.cittainvisibili.com/en/portfolio/zora-en.html.

Using the existing service entrance building transformed into the main visitor entrance, visitors are brought below ground through the No. 1 conduit tunnel via a winding staircase. The sound of the falls can be heard at the top of the entrance as soon as the visitors begin their descent. The passage through the cliff creates a chamber of sounds as the rushing water below echoes past the visitors.

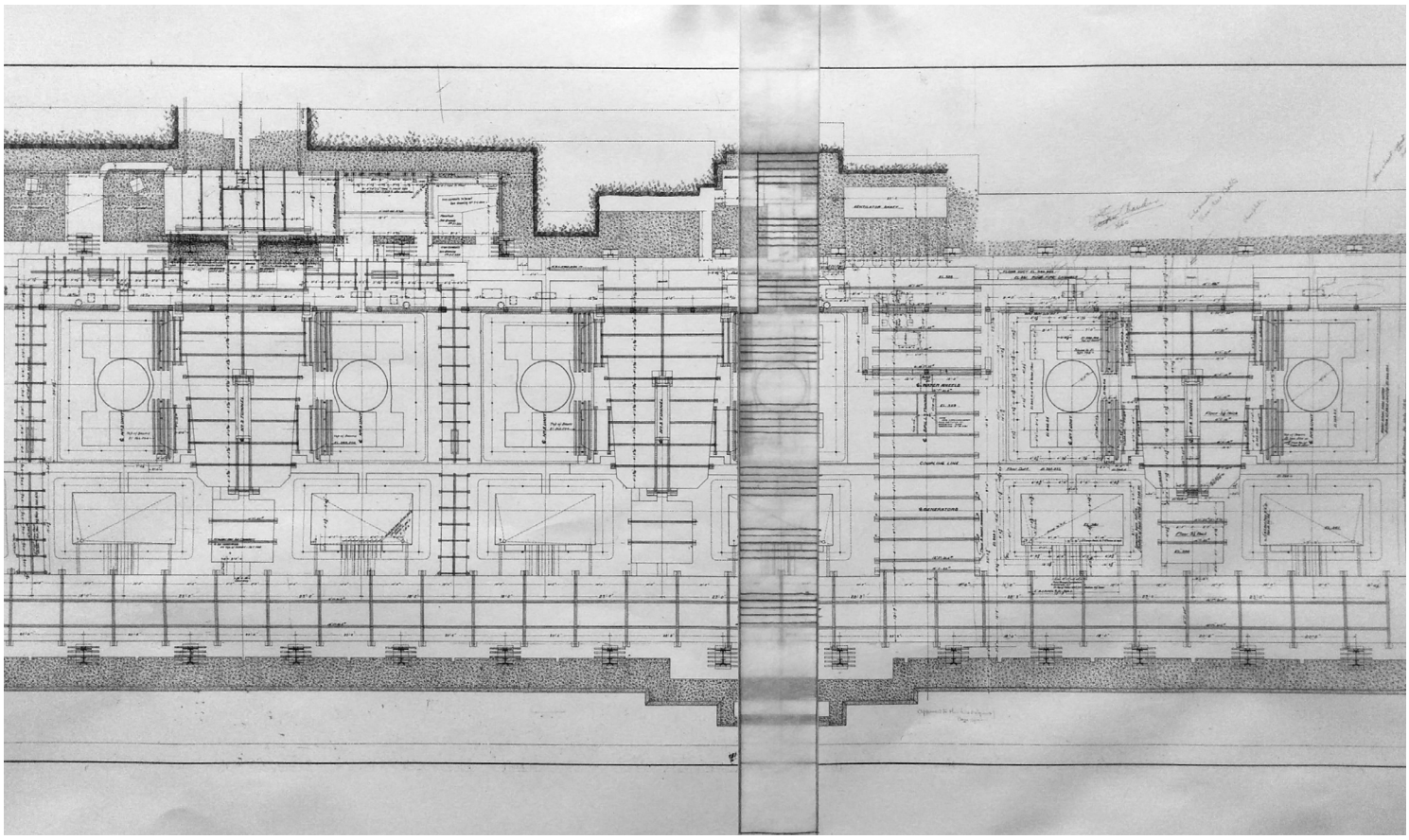
Descending further into the hardened depths of time through existing access tunnels made wider – exposing the stratum surface – the void in the earth narrows. Into the last passage before emerging out of the cliff, a long and gradual incline brings the visitors down to the building, guided by both the light at the end and the growing feeling of the mist from the falls.

opposite:
ENTRANCE THROUGH THE CLIFF
Figure 2.34, cast concrete, rockite concrete, concrete patching compound, plexiglass painted black, pvc pipe, and digital collage


ELEVATOR
STEEL PENSTOCKS
THREE WATER CONDUITS
ELECTRIC CABLES
TUNNEL
STEEL PENSTOCKS

Emerging from within the cavernous entrance sequence, visitors are positioned between a four-meter wide void removed from the existing building. While permitting entrance into the building via a walkway to the side, visitors are brought down to the water through an elongated staircase that cuts through the cross-section of the building, past and between the tailrace tubes that once carried water into the turbine and back out to the river.

opposite:
CUT THROUGH THE BUILDING
Figure 2.35, sketch by author overtop original drawing, P.N. Nunn, The Ontario Power Company, *General Floor Plan, Generating Station Units Nos. 1 to 8* (Niagara Falls: 1905).



Stepping out from the cover of the cave, visitors are engaged with a direct relationship to the water framed by the cutaway mass of the building. The four-meter wide laneway acts as an amplifier of sound, carrying up the thunder of the water into the void of the building.

The underground mechanics and tailraces that lay below the position where the generators once were are revealed to the visitors as they descend the stairs. The top-sealed tailraces open up to the front of the building, creating a faint whistle as the wind whips past, playing the building like an organ pipe.

Passing the threshold of the void in the building and the open air, the visitors step onto a transparent ledge suspending them above the water. The visitors stand naked to the elements, no longer protected between the building's chasm.

opposite:
FROM OUT THE CAVE
Figure 2.36, image by author,
digital collage

In its existing condition, the cliff runs into the rear wall, making the length of the back of the building a large retaining wall.

Rock matter is removed to create a passage between the cliff and the building. The removed matter is crushed into particle aggregates to be used as an ingredient in the re-casting of a rammed concrete wall. The natural tonal difference in the individual layers of stratigraphy composing the cliff creates similar tonal striations in the different layers of the rammed concrete wall. As visitors move through the passage – cliff face on the left and re-casted wall of great immensity on the right – they occupy the intermediary space between a natural element and its abstracted re-construction. The wall's immensity is made more legible as the width of striations nearing the bottom become smaller, exaggerating the weight of the earth material bearing down.

The passageway permits access into the building while leading from the north side of the building, to which the existing half-kilometer service road from Niagara Parkway leads. Spaces are carved into the cliff at intervals that align with the position of the now-removed generators once contained inside the building. These voids spatialize an absence of human industrial ingenuity.

opposite:
BETWEEN THE CLIFF AND
A RE-CASTED CLIFF
Figure 2.37, image by author,
digital collage


NIAGARA
FALLS
PARK
ONTARIO POWER COMPANY GENERATING STATION
ONTARIO POWER COMPANY DISTRIBUTING STATION
MICHIGAN CENTRAL R.R. MAIN LINE
CLARK STREET
VICTORIA
WALNUT
ROAD
FERRY

Having undergone years of transformation due to an increase and eventual decrease of demand as the industry developed around it, the Ontario Power Station building, much like the processes of the earth, serves as an artifact, a ruin, and a potential construction site.

The interior proposals take on the concept of new spaces carved from old matter that has been formed in slow time. These new spaces are to be composed of glass brick – a material that is an elder product of geological forces. The container and the contained are inextricably linked. Recalling Adam Bobbette's remarks comparing Lyell and Harrison, "The fossil is no longer an object contained in a rock; within this logic, it becomes the entirety of the earth itself – the fossil is necessarily that which we inhabit and that which we read."[78]

The hand that sculpts and cuts away the glycerin blocks mimics that of the natural forces slowly rumbling underfoot.

78. Adam Bobbette, "Episodes from a History of Scalelessness: William Jerome Harrison and Geological Photography," in *Architecture in the Anthropocene: Encounters Among Design, Deep Time, Science and Philosophy*, ed. Etienne Turpin (University of Michigan, Ann Arbor: Open Humanities Press, 2013), 54.

opposite:
NEW SPACES FROM OLD MATTER
Figure 2.38, image by author, carved glycerin soap, digital collage

A series of spaces contain artifacts of geological, human ancestral, and industrial remains. The artifacts together detail a chronology of deep time on Earth. The glass brick walls contain the objects, embedded in their mass.

opposite:
CHRONOLOGY OF ARTIFACTS
Figure 2.39, image by author, carved glycerin soap, digital collage

A series of separated volumes in close proximity each emit spoken words from one of the estimated seven thousands languages of the world.

The Long Now Foundation is developing an on-going archive called 'PanLex', which aims to index all of the languages of the world. Many languages face the risk of extinction, and in fact, some languages can no longer be heard today. PanLex's main goal is to allow the thousands of languages to live on into the long-term future, by being able to translate any word into any language, indexing thousands of years of linguistic evolution and variation.[79]

Each separate volume emits a cycle of words spoken in a language that is transmitted through headphones worn by the occupant. The diaphanous material qualities of the glass brick allow adjacent volumes to be ghosted in the occupants' periphery, creating a large field array of spatialized languages.

79. "Panlex: Every Word in Every Language," *Panlex*, accessed July 24, 2015, http://panlex.org/.

opposite:
SPATIALIZED LANGUAGES
Figure 2.40, image by author, carved glycerin soap, digital collage

Research facilities contained within the carved translucent walls focus on the 'Revive and Restore' program for the Long Now Foundation. Revive and Restore's focus is on the research and genetic rescuing of endangered and extinct species – whose disappearance is a result of humankind. As Stewart Brand states in an article entitled *The Case for Reviving Extinct Species* (2013), "Why do we take enormous trouble to protect endangered species? The same reasons will apply to species brought back from extinction: to preserve biodiversity, to restore diminished ecosystems, to advance the science of preventing extinctions, and to undo harm that humans have caused in the past."[80]

Not only will the research benefit species lost to time, Brand notes, "Techniques being developed for de-extinction will also be directly applicable to living species that are close to extinction. Tiny populations can have their genetic variability restored. A species with a genetic Achilles' heel might be totally cured with an adjustment introduced through cloning."[81]

There is of course a debate to be had on the ethics of this type of project; however, for its relevance to the concept explored in this thesis, that is perhaps a matter to be discussed elsewhere. Revive and Restore will allow the past to be unpacked and explored. Considering the concept of *time turned into memory*, Revive and Restore can potentially allow *time* to exist not only as an imagined mental transportation to the past, but can allow the past to collide with the present, permitting us to experience that which seems experientially unreachable.

80. Stewart Brand, "Opinion: The Case for Reviving Extinct Species," *National Geographic News*, March 12, 2013, accessed July 22, 2015, http://news.nationalgeographic.com/news/2013/03/130311-deextinction-reviving-extinct-species-opinion-animals-science/.

81. Ibid.

opposite:
RESEARCH LABS
Figure 2.41, image by author, carved glycerin soap, digital collage

Ideas are capable of being transmitted through time. An allegorical painting communicates an idea of deeper meaning through painted symbols; practices are passed down through generations, communicating methods of working; transcribed in a book, authors are able to communicate ideas to audiences of periods different from their own; oral testimony provides a first-hand account of an experience once lived.

During a seminar hosted by the Long Now Foundation, author Neil Gaiman spoke on the topic of how stories last, stating, "The reason why story is so important to us is because it's actually this thing that we have been using since the dawn of humanity to become more than just one person… Stories are ways that we communicate important things, but… stories maybe really are genuinely symbiotic organisms that we live with, that allow human beings to advance." [82]

A space is created for sharing stories, lecturing on academic topics, or hosting reading circles, allowing ideas to permeate through inquisitive minds, setting the stage for long-term thinking.

82. Neil Gaiman, "How Stories Last," (presentation, The Long Now Foundation, San Francisco, CA, June 9, 2015).

opposite:
STORY TELLING
Figure 2.42, image by author, carved glycerin soap, digital collage


- EPILOGUE -

Throughout the early stages of my work in *Variations on a Theme of Deep Time: From Geology to Architecture*, I was never certain how the thesis would manifest itself. If I had outlined an approach to a conclusion, perhaps these confines would have produced a wholly disparate thesis.

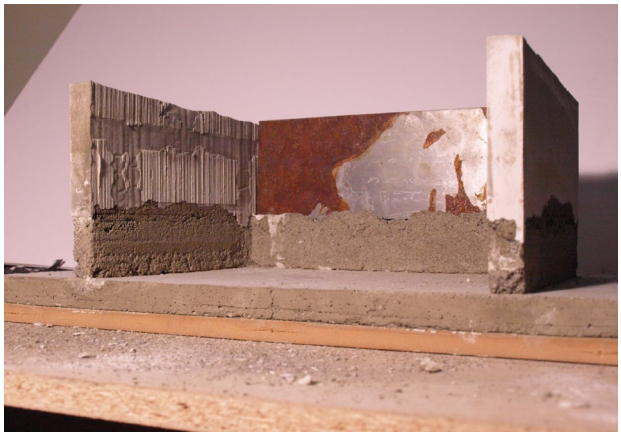
Throughout the first year of considering the work's direction, I was thinking, drawing, building, photographing, and collaging architectural spaces and elements. This process began to reveal a particular method of working and thinking about architecture that fed my interests in spatializing and impressing an architecture of time, during an age where data collection, mapping, and computational scripting has begun to dominate the practice of architecture.

It is clear to see my attraction to this world of artifacts from the remnants of time. These artifacts, in combination, present a body of work that attempts to bridge the concepts founded in geology with architecture, fusing the stage of man with his creations.

Within the room where this thesis is presented – and later the space in which it is read – we and the artifacts contained within are like those painted in Gandy's work for Soane. These elements, all of which exist tucked away in a cave within *Architecture: Its Natural Model*, amongst and between the forming and eroding earth, the growing trees, and primitive man.

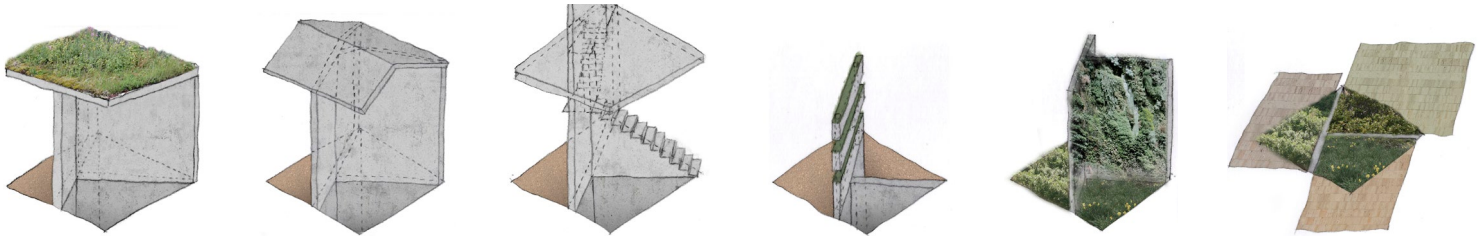
opposite:
SITUATED
Figure 2.43,
top:
photography by author
middle:
Joseph Michael Gandy, *A Selection Of Parts Of Buildings, Public And Private, Erected From The Designs Of John Soane,* 1818, 130cm x 72.5cm, Exhibited at R.A., Soane Museum, accessed July 14, 2015, http://www.culturaimpopular.com/2013/04/un-encuentro-de-mentes.html.
bottom:
Joseph Micahel Gandy, *Architecture: Its Natural Model*, 1838, oil on canvas, 80 in. x 52 in., Sir John Soane's Museum, London, accessed July 14 2015, https://commons.wikimedia.org/wiki/File:Joseph_Gandy_001.jpg.


- ARCHIVE -



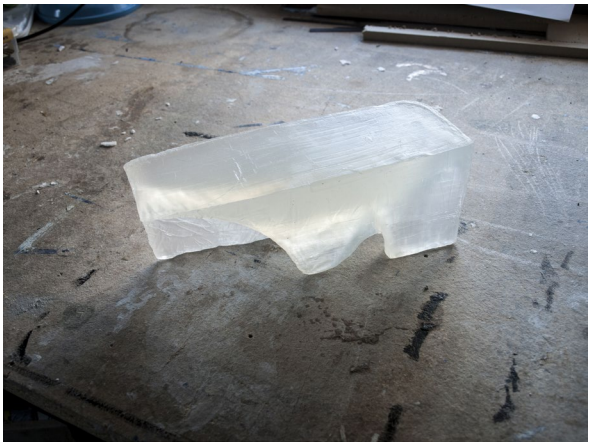
83. Google Maps, *Niagara Falls*, Existing Service Entrance Building, accessed July 25, 2015, https://www.google.ca/maps/@43.081798,-79.07809,3a,75y,335.32h,84.24t/data=!3m6!1e1!3m4!1sNsasJOc54Ue5dWj-Ph2wgA!2e0!7i13312!8i6656.

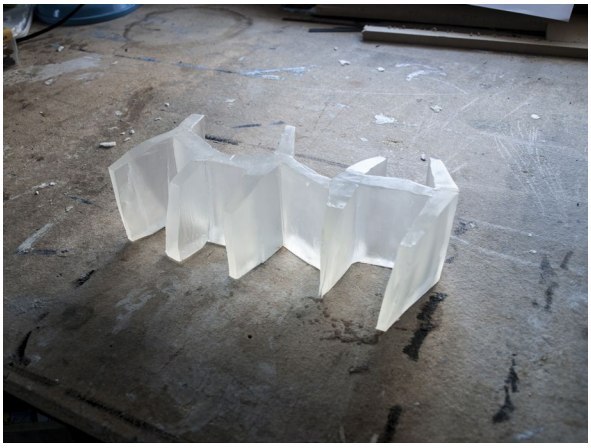
84. Jamie Sarnier, "Hollowed Ontario Power Company," *Derelict Power Stations Photo Essay*, July 15, 2012, accessed July 25, 2015, http://jamiesarner.com/toronto-life/2012/07/derelict-power-stations-photo-essay/.



83.

84.





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