MEASURES

Monastery for an Atomic Priesthood; Hanford, WA

Douglas Brandon

A thesis

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Rob Corser

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Douglas Brandon

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Abstract

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Monastery for an Atomic Priesthood; Hanford, WA

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Chair of the Supervisory Committee:
Associate Professor Rob Corser
Architecture

This thesis, conceived in divination and ritual, addresses the past and the future in their inconceivable entirety. Whether concerning elusive properties of substances, impossible celestial mechanics, necessarily incomplete mathematical systems, or reticent atomic particles; the history of human knowledge is riddled with immeasurability, especially in relation to the limits of observation in size (large and small) and speed (fast and slow). As a theme, the unfathomable infects its students, and this project charts that infection.

Due to the longevity, concentration, and potency of man-made radioactive materials produced since 1945, an Atomic Priesthood, as a possible guardian of knowledge about the nature and location of nuclear waste, must last at least as far into the future as the earliest cave paintings reach into the past. This proposal for a monastery to contain and propagate such a society questions the role of control in architecture, when timelines stretch beyond single generations, and risk in architecture, when failure leads to oblivion.

Pivoting around the complexity of Hanford, Washington, former site of plutonium production for atomic bombs Gadget and Fat Man, this investigation challenges modes of analysis and representation when architectural processes begin to flirt with infinity.

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FOREWORD

Atomic Pilgrims:

Los Alamos to Hanford,

then Trinity Site

Priests' sacred knowledge:

Encoded in DNA…

Seeking shape, form, light

Rob Corser

There is an hour of the afternoon when the plain is on the verge of saying something.
It never says it, or perhaps it says it infinitely, or perhaps we do not understand it,
or we understand it and it is as untranslatable as music.

Jorge Luis Borges [1]

MEDITATION

The following charts an individual's brushes with the infinitely large and the inconceivably small. The investigation may seem tortuous with respect to typical architectural theses, but this is a record of both discovery and design.

Architects negotiate time, scale, and place via tools and vocabularies they acquire in practice, study and thought. Common conventions include historical and site research, collections of precedents and inspirations, design concepts, and various representational techniques that depict design responses. Though certainly effective in most cases, these methods begin to warp when approaching the gravities this project suggests. What is the most enduring aspect of architecture? How do we measure time? Can ideas endure forever? This thesis hopes to retain a sense of self while interrogating themes that surpass the brevity of human history and exceed the Earth's humble size. In a way, perhaps the provisional discoveries here will point to the ways architecture can help us locate a self, however that might happen.

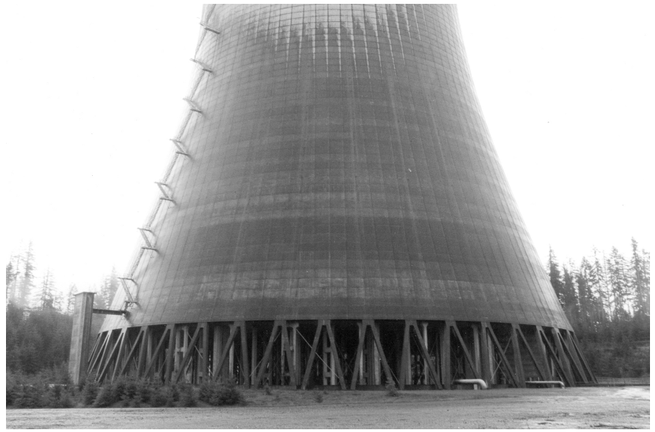
This document loosely follows the chronological progression of the study, beginning with a series of experiments in risk, control, and chance; moving to histories of Hanford Site and the Atomic Priesthood; and finally suggesting the design of an algorithm – a migration across the desert, carrying the fire and producing fire water. This document, in its incompleteness, is the seed of a much larger project, which is alluded to in the discussion and concluding reflection.

Men are born for games. Nothing else. Every child knows that play is nobler than work.

He knows too that the merit of a game is not inherent of the game itself,

but rather in the value of that which is put at risk.

Cormac McCarthy [2]



Satsop Cooling Tower; Elma, WA

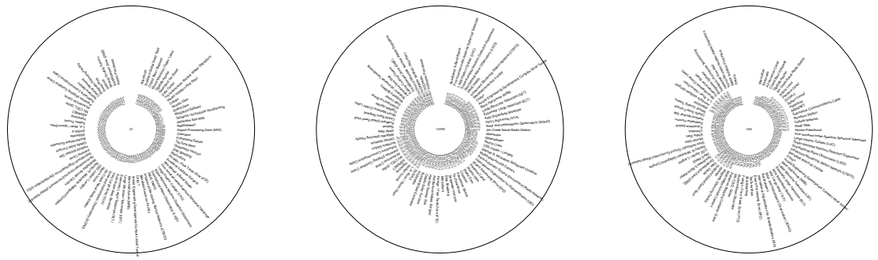
DIVINATION

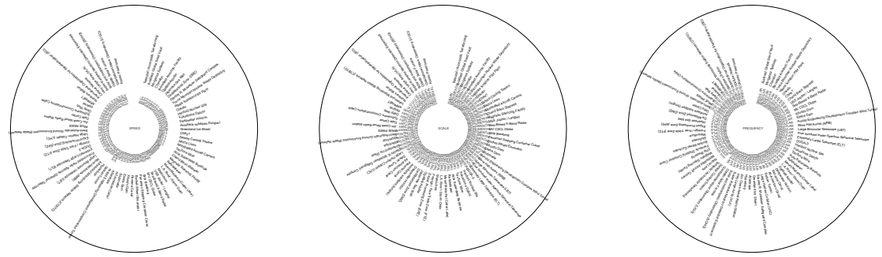
The exploration begins with an image and a feeling. Uncovered while searching for dams in Washington State on the Center for Land Use Interpretation's online Land Use Database, this haunting photograph features one of two hyperbolic cooling towers near Elma, WA. The bond default of the Washington Public Power Supply System (now Energy Northwest), in part because of the Three-Mile Island nuclear disaster, causes the cancellation of this project. These austere slip-formed 146-meter tall concrete vessels, engineered with precision to accomplish heat transfer for a never-completed nuclear reactor, still stand today, largely unused, as shadows of our grandparents' dreams of ubiquitous nuclear energy. [3]

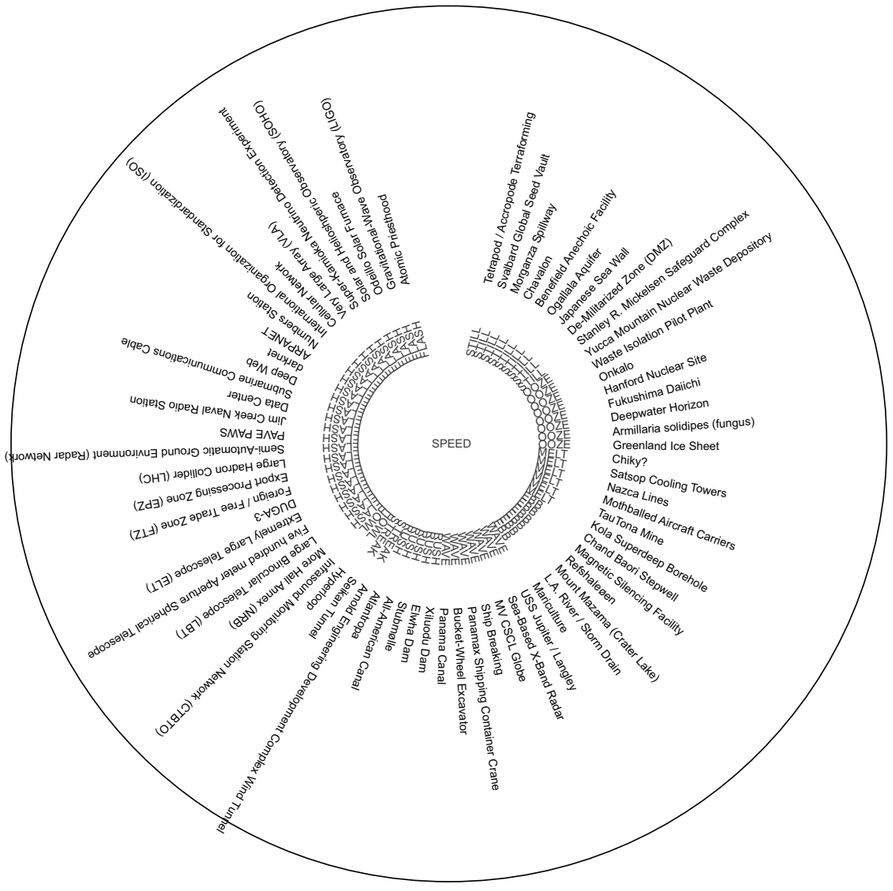
TAXONOMY OF ODDITIES

An early draft of the thesis statement reads: *The remoteness or inaccessibility of a place, for instance, might also prove to be its biggest asset. In an increasingly connected, well-lit, safe world, perhaps there are opportunities for a return to solitude, darkness, and the subtle yet instructive danger of the unknown.* Themes of spatial and social isolation, as well as ideas about abandoned or underused investments in the built environment lead in the beginning to a study of strangeness and architectural oddity.

Magnetized by these sorts of spaces without knowing exactly why or what potential they contained, the thesis catalogues and categorizes architectural *oddities*. Initially, a messy list of interests includes massive engineered mega-structures (Xiluodu Dam, Panama Canal), tools for mining and excavation (Bucket Wheel Excavator, TauTona Gold Mine), inhabitable scientific detectors and instrumentation



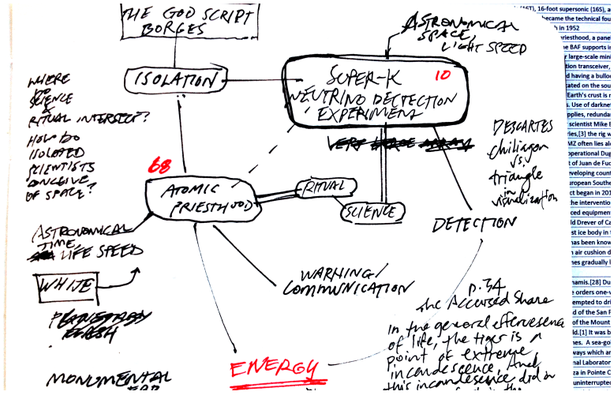


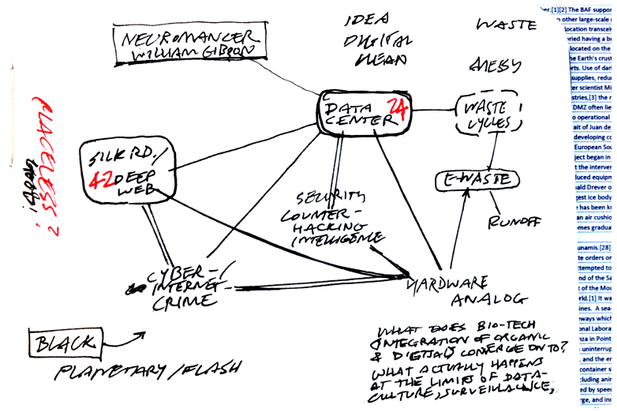


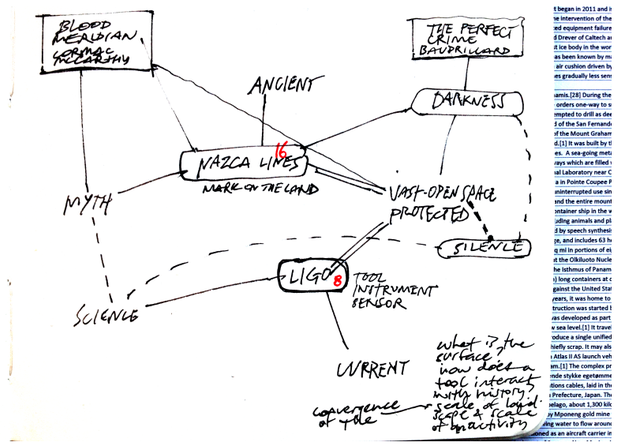
Categorized Taxonomy of Architectural Oddities

(CERN, Super-Kamiokande Neutrino Detection Experiment), utilitarian servants of national defense or public safety and sanitation (Sea-Based X-Band Radar, Morganza Spillway), or the occasional distributed abstraction (Deep Web, Numbers Stations). Entranced by the beauty of spaces for scientific experimentation, as an example, an architect searching for a project naturally seeks spatial potential in each building, detector, vehicle, and location. But the oddities are also interrogated on their own terms regarding how they function, what their operators and inhabitants hope to discover, and what larger systems they engage.

Ultimately, the taxonomy becomes an analytical tool and a revelatory exercise. For each of the seventy-two oddities collected, the *identity, action, aim, speed, scale,* and *frequency* is diagnosed and recorded. After creating ordered rubrics for each of these signifiers, a custom-built definition in Grasshopper for Rhino arrays them each visually, in turn, around a circle. The *speed* category, for example, is made up of the terms *still, ooze, melt, ebb, wave, rush, streak, howl,* and *flash*. Identity (either *cache, wall, farm,* or *tool*) suggests that each oddity has an essence that transcends its intended purpose. This process of classification and encoding offers a multi-layered understanding of the oddities that extracts both hidden similarities and non-obvious differences. Perhaps re-casting a list of atypical interests in this light unearths curious features of scale itself.

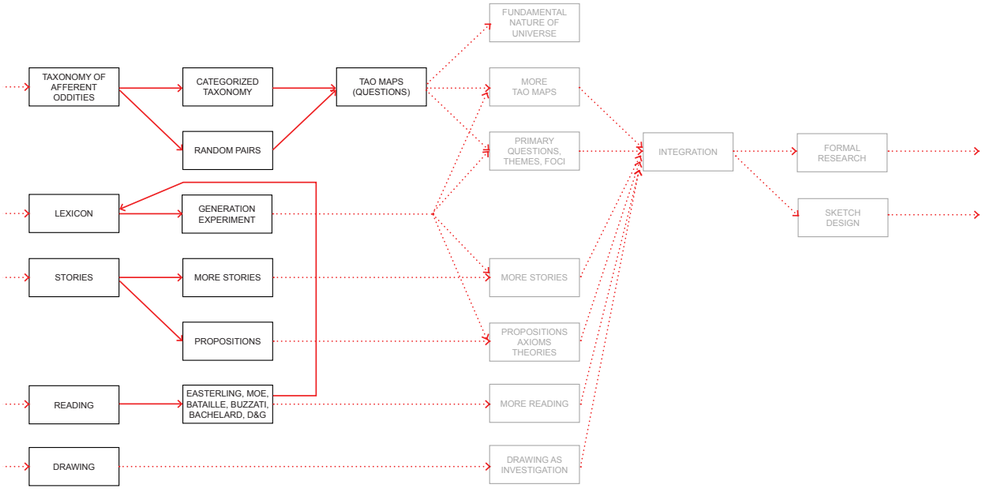


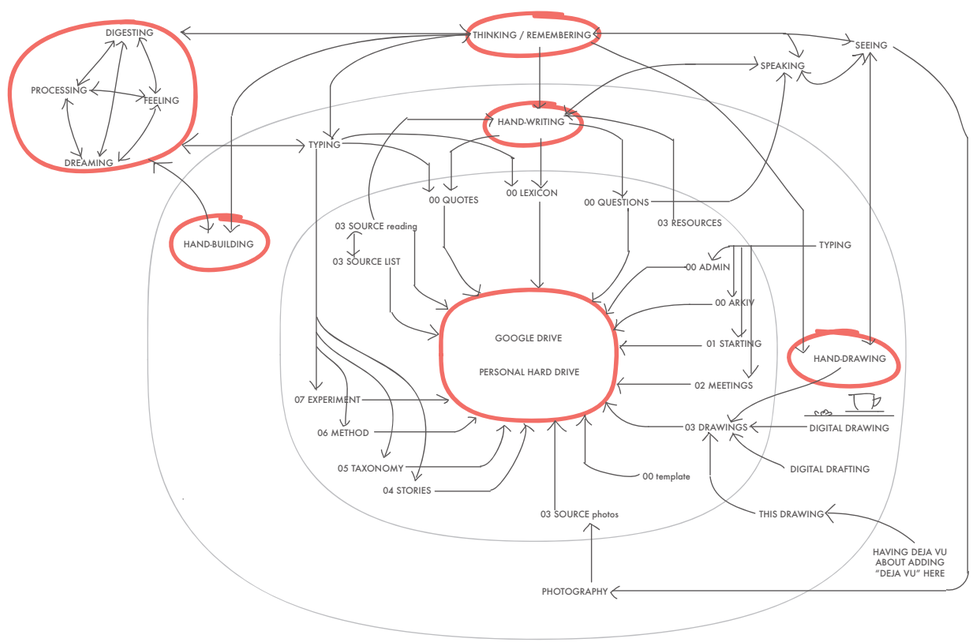




Random-Pair Mappings

A series of mappings follow the investigation of architectural oddities. These logical sketches of potential projects, visual assemblages of the bones and ligaments of possible narratives, each spring from a random pair of oddities. The procedures, stretching the imagination and exercising designer's muscles, are both fruitful and overwhelming. Due to the richness of these constellations, one can imagine many potential thesis projects, but this forces the question: how do designers decide?



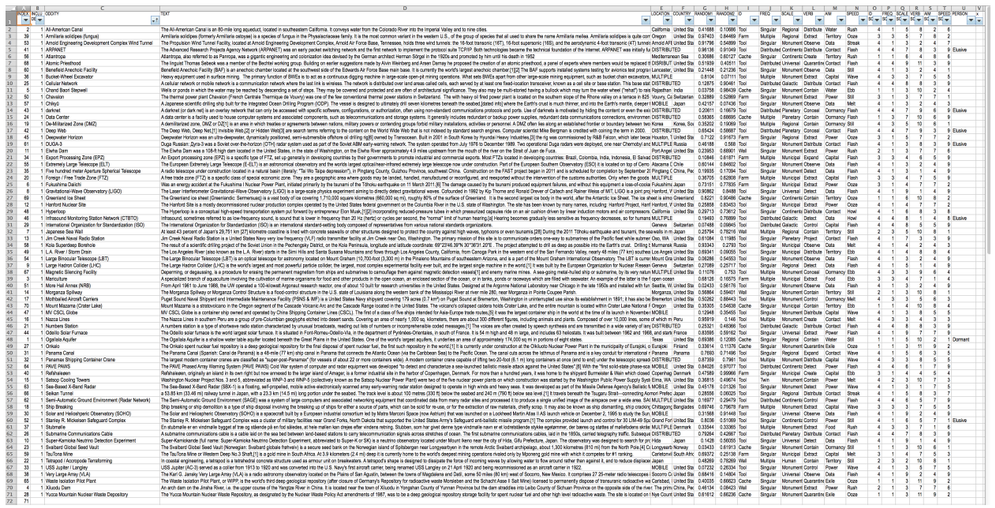


Scheduling Control
Information Control

CONTROL AND RISK

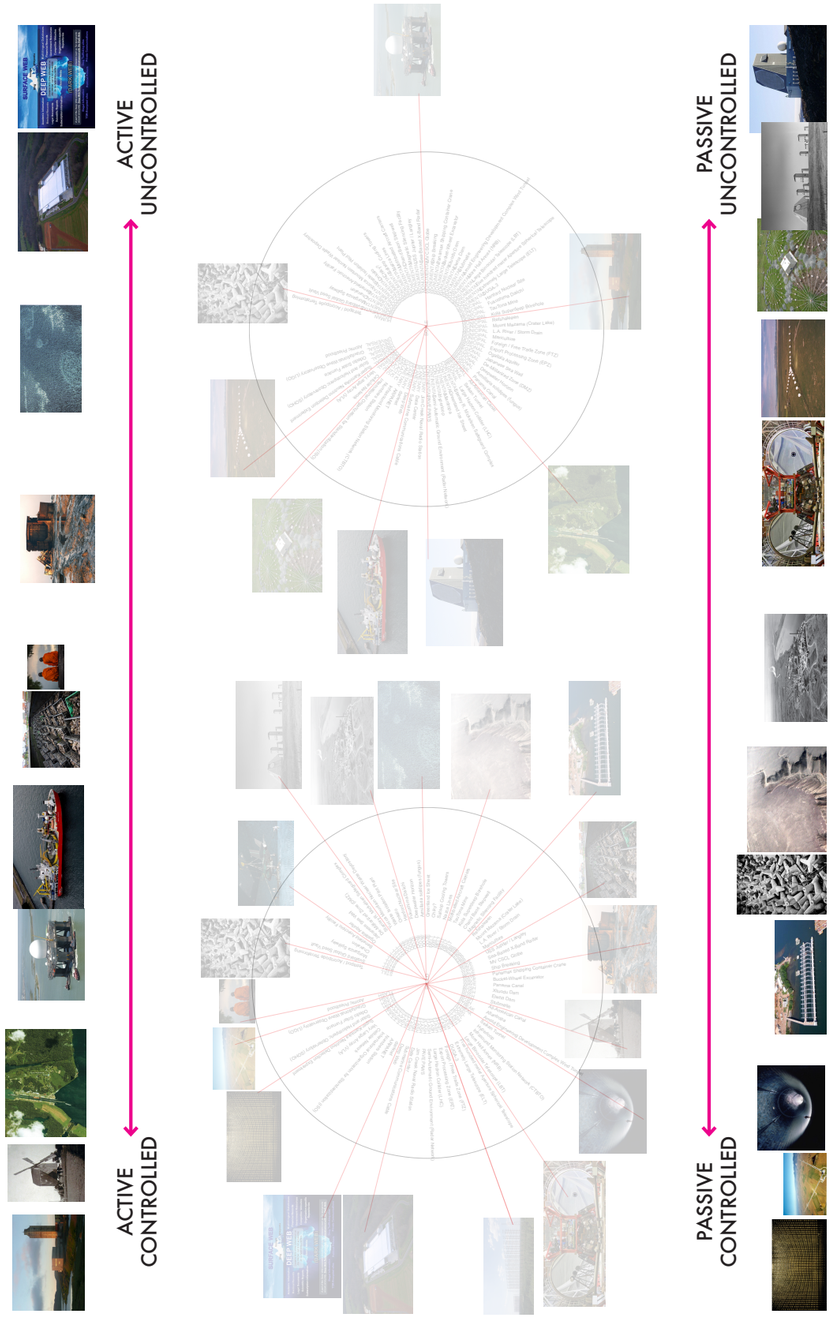
Architectural design in the 21st century, as a career path, involves the creative exercise of control within given, well-understood boundaries. We often start with the site plan, code, and brief. We document conditions that are fixed, and investigate those we might propose changing. We work within constraints that demand ingenuity, often giving projects life and unique qualities. However ultimately, architects are bound to certain standards in convention, regulatory codes, and laws. Stakeholders, owners, and decision-makers continually evaluate the intelligence of an architect's decisions with respect to their priorities, whether highlighted or hindered by the architect's ability to illustrate clearly. Designers must control or mitigate risk on many levels, whether in service of communication, reputation, or human safety.

Even in early stages of design, transparency guides the sharing of information, offering democratic access to knowledge for all collaborators. The collaborative BIM environment is emblematic of this condition – full openness and integration. Risk is apparently limited, in part, by ubiquitous access and the hyper-control of variables. Future buildings are modeled and detailed in 3D, with everybody watching. Individual identities recorded in user histories, the system promotes honesty, visibility, and caution. However, many variables fall outside the boundaries of this all-encompassing control of knowledge. The site itself is a living, changing place, subject to natural disasters, weather, decay, and unpredictable social conditions. The many possible futures of economies, governments, and personalities influence design outcomes in unpredictable ways.



Finally, the resolution of the representative 3D model will never be good enough, if only on the Borgesian philosophical level; only a 1:1 scale model of a building will ever accurately represent its real-world equivalent. [4] Drawing anything is risky, because communication is risky. The moment the drawing is born, it enters the public space and becomes a message or symbol, standing in for an idea in the designer's mind. The as-built drawing isn't even perfect – a strange official summary of the way something was more or less probably built, as can best be described without taking the new structure apart again. We accept the drawing as an interlocutor, with an unintended but fascinating distance between intentions and outcome. To eliminate this distance is impossible. Perhaps to embrace and expand it could be fruitful, and of course, some architects already have. As Kiel Moe argues, it is the precise design of this gap that enables potent, long-lasting architecture, writing of Louis Kahn's work:

To grasp the complex adaptive effects of the Salk Institute, it is essential to view the building in action, over time […] Dr. Salk, though, did not view the pipe laboratory simply as a space for the circulation of air, water systems, or for maintenance work. He described his ideal building to Kahn more specifically as a mesenchyme space. Mesenchyme cells are the portion of an embryo containing non-specific cells that develop into other tissue and organ systems. In other words, mesenchyme tissue is specifically generic: its precisely vague qualities engender multiple possibilities and novel functionalities. [5]

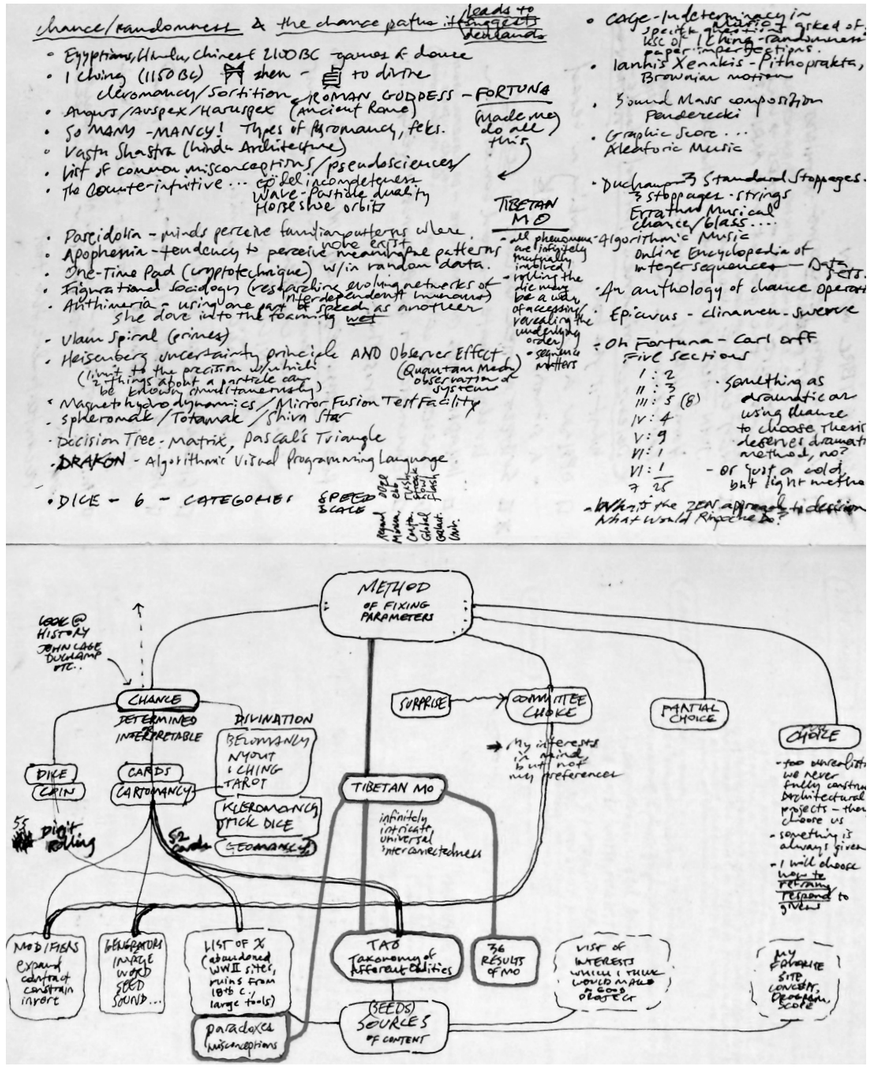


Spectra of Control

By developing a new way of seeing and categorizing strange places with architectural qualities, this process illuminates curious qualities about the relationship between architectural space and design intentions. Namely, powerful spaces don't always correlate with architectural intentions. We perceive Piranesian caves, sewers, and dungeons, for instance, with awe and fear, whether or not their design intended that response. In some cases, as products of geology or accident, they have no designer. Without an architect present to translate, in fact, all spaces are subject to creative interpretation and reflection within the subject. In this sense, the designer gives up a measure of control the moment building operation begins. But the design process itself, as a collaborative conversation between architects, builders, engineers, and other specialists, is equally subject to translation and interpretation. For this reason, the thesis casts *control* in architecture along a spectrum on which designers operate, and as a perceptual condition that can be contrasted with ideas about risk and chance.

Though subject to engineering specification, the architectural oddities have little or no architectural design in their heritage. They fall outside the realm of architectural control, yet evoke meaningful architectural responses. In particular, one reacts to the superimposition of scales and speeds in their spaces, whether small and controlled, vast and crude, or abstract and distributed. The Super-Kamiokande Neutrino Detection Experiment, for example, is a roughly 40-meter high, 40-meter diameter stainless steel tank buried 1,000 meters beneath a mountain in Japan. Lining the walls of this tank, which is filled with water, are nearly 13,000 hand-blown glass photomultiplier tubes, most about 50 cm in diameter. These are part of a system that detects the Cherenkov radiation occasionally triggered when minuscule sub-atomic particles from the Sun called neutrinos pass through water. [6] Though usually sealed, technicians perform periodic maintenance from rafts floating within the enormous tank, which Gursky captures expertly in 2007.

While operating with an analytical architectural methodology, related to the human body and its place in space and time, originating in a desire to categorize and order the world, this thesis generates questions about risk and control in design. Investigating ideas about the thesis itself and its relationship to design in reality, the project contorts into a self-referential line of questioning: how can a project address reality if the author designs its primary constraints and conflicts? How could a designer source primary themes or questions from without? What if a designer refuses to define some aspects of the problem? What would it mean to invert control and risk in an architectural project?



Ways of Knowing, Decision Methods

WAYS OF KNOWING

The investigation follows the threads of risk and chance by exploring ways of deciding including: fortune telling, dice rolls, all manner of prefixes for –mancy (geo, carto, pyro), and divination. Perhaps by leaving some elements of the project to chance, the role of the designer in the generation of architectural space can be more sincerely questioned.

Recognizing the history of chance in art, primarily Marcel Duchamp's stoppages and some of John Cage's participatory methods, as necessary starting points, the next step involves a designed series of ordering activities. It also incorporates a version of the Tibetan Buddhist MO, a form of divination and decision-making involving dice. Four lists of terms are collected, ordered, and finally selected in a two-phase decision procedure involving chance and ritual.

		MO
6	6	Stainless Sky
6	2	Flaming Rays of the Sun
6	3	Nectar Rays of the Moon
6	5	Bright Star
6	4	Ground of Gold
6	1	Tone of Vajra
2	6	Bright Lamp
2	2	Adding Butter to the Burning Flames
2	3	Demon of Death
2	5	Sovereign of Power
2	4	Dried Up Tree
2	1	Door of Auspicious Visions
3	6	Vase of Nectar
3	2	Pool Without a Source of Water
3	3	Ocean of Nectar
3	5	Demon of Afflictions
3	4	Golden Lotus
3	1	Nectar-Like Medicine
5	6	White Umbrella of Good Fortune
5	2	Great Fiery Weapon
5	3	Emply of Intelligence
5	5	Streamer of Fame
5	4	Mara Demon of Aggregates
5	1	House of Good Tidings
4	6	Golden Mountain
4	2	Demon of the Heavenly Son
4	3	Overflowing Jewelled Vessel
4	5	Scattered Mountain of Sand
4	4	Mansion of Gold
4	1	Treasury of Jewels
1	6	Manjushri Appears
1	2	Endless Auspicious Knot
1	3	Golden Female Fish
1	5	White Conch
1	4	Golden Wheel
1	1	Jewelled Banner of Victory

	LOP
1	Decision theory
2	Vagueness
3	Chemistry
4	Physics
5	Mysticism
6	Probability
7	Economics
8	Self-Reference
9	Classical Mechanics
10	Perception
11	Astrophysics
12	See also
13	Logic
14	Geometry and topology
15	Infinity and infinitesimals
16	Statistics
17	Mathematics
18	Biology
19	Quantam mechanics 2
20	Economics 2
21	Philosophy 2
22	Decision Theory 2
23	Probability 2
24	Self-Reference 2
25	Miscellaneous
26	Psychology and sociology
27	Politics
28	Philosophy
29	Linguistics and Artificial Intelligence
30	Time travel
31	Health and nutrition
32	Thermodynamics
33	Relativity
34	Quantam mechanics
35	Electromagnetism
36	Cosmology

ODDITY1	ODDITY2
Hyperloop	Stanley R. Mickelsen Safeguard Complex
Data Center	TauTona Mine
Armillaria solidipes (fungus)	Mariculture
ARPANET	Large Hadron Collider (LHC)
Arnold Engineering Development Cen	Magnetic Silencing Facility
De-Militarized Zone (DMZ)	MV CSCL Globe
Foreign / Free Trade Zone (FTZ)	Mount Mazama (Crater Lake)
Infrasound Monitoring Station Networ	Sea-Based X-Band Radar
Chavalon	Refshaleøen
Chand Baori Stepwell	Odeillo Solar Furnace
Andreas Wahl underwater bullet test	Large Binocular Telescope (LBT)
darknet	Yucca Mountain Nuclear Waste Depository
All-American Canal	Numbers Station
L.A. River / Storm Drain	Xiluodu Dam
Cellular Network	Waste Isolation Pilot Plant
Kola Superdeep Borehole	Very Large Array (VLA)
International Organization for Standar	Mothballed Aircraft Carriers
Deepwater Horizon	USS Jupiter / Langley
Chikyū	Tetrapod / Accropode Terraforming
Atlantropa	PAVE PAWS
Bucket-Wheel Excavator	Panamax Shipping Container Crane
Jim Creek Naval Radio Station	Svalbard Global Seed Vault
Fukushima Daiichi	Mirror Fusion Test Facility
Japanese Sea Wall	Super-Kamioka Neutrino Detection Experiment
Benefield Anechoic Facility	Submarine Communications Cable
Atomic Priesthood	Stubmalle
Hanford Nuclear Site	More Hall Annex (NRB)
Geoglyphs / Nazca Lines	Morganza Spillway
Greenland Ice Sheet	Solar and Heliosphperic Observatory (SOHC)
Gravitational-Wave Observatory (LIG	Ogallala Aquifer
Five hundred meter Aperture Spherica	Onkalo
Elwha Dam	Ship Breaking
Extremely Large Telescope (ELT)	Semi-Automatic Ground Environment (Radar Netw
Export Processing Zone (EPZ)	Seikan Tunnel
DUGA-3	Satsop Cooling Towers
Deep Web	Panama Canal

Tibetan Buddhist MO, List of Dicsiplines
List of Architectural Oddities

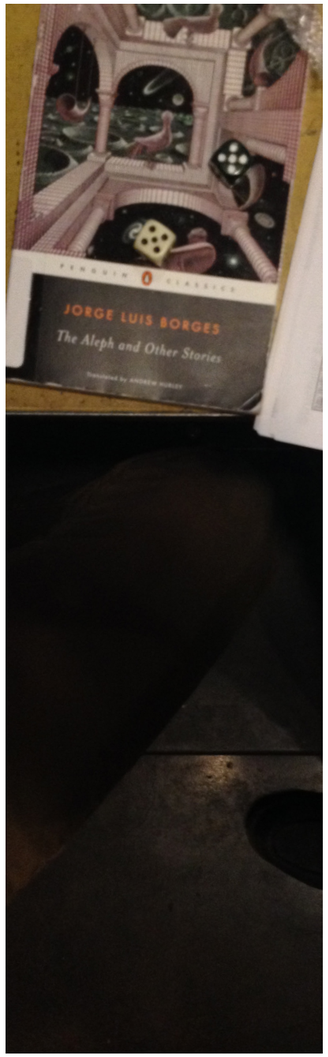
The first list is the Tibetan Buddhist MO itself, pre-ordered by ancient texts. This system of divination, traditionally performed with dice rolls, is believed to give practitioners access to wisdom in decision-making. As one writer notes,

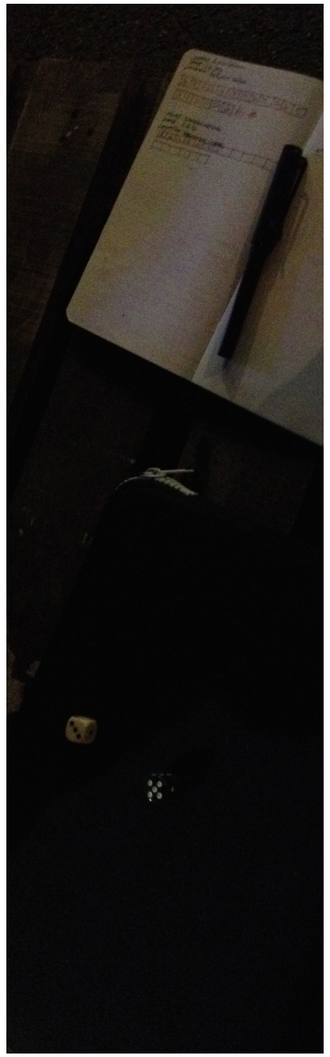
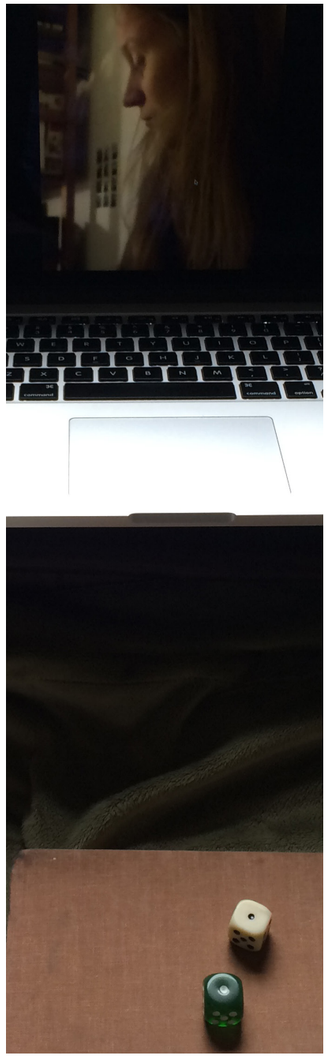
In Buddhist thought, synchronicity attests to the truth of the doctrine of *pratityasamutpada*, the phenomenon of independent co-arising by which all phenomenon appearing in the universe are mutually inter-involved to an infinite extent […] In such a worldview, consulting a chance event like throwing a die may actually reveal a deeper underlying meaning that is obscured by the causal relationships of physical events. [7]

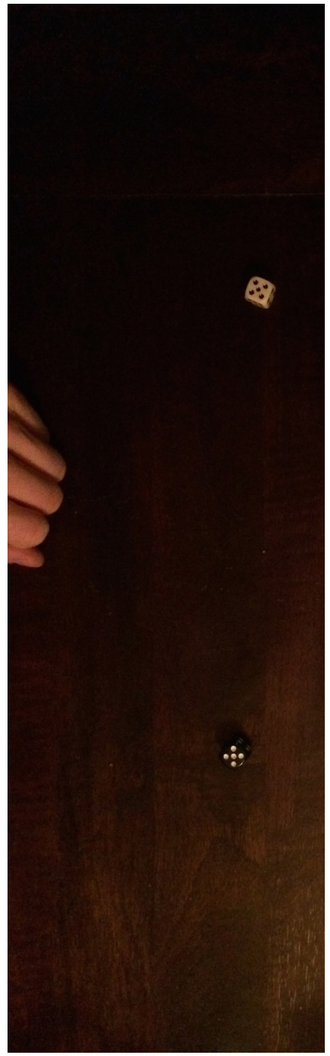
The MO Divination is performed in a series of meditative steps that involve casting one die twice, yielding one of 36 possible combinations of syllables. The order of the syllables then signify a particular result: a name. These names are various and colorful including, for example, Nectar Rays of the Moon, Mara Demon of the Aggregates, or Endless Auspicious Knot. Acknowledging the variation in spirit and subject here, perhaps the inevitability of the themes this project engages becomes clearer.

The next list comes, with minor editing, from the categories in the "List of Paradoxes" from Wikipedia. For the project, these represent a set of disciplines with internal conventions, commonly held beliefs, internally disputed viewpoints, practitioners, and fairly well defined operating boundaries. These disciplines function as ways of knowing the world, just as divination is a way of knowing the world. They are common positions from which humans seek to document, understand, and change themselves and their environments.

The final two lists come from halving the Taxonomy of Architectural Oddities, yielding two groups of 36 members. These lists, though wholly unusual, limit the scope, forcing the abandonment of a majority of fascinating locales and ideas in order to focus closely on just a few.

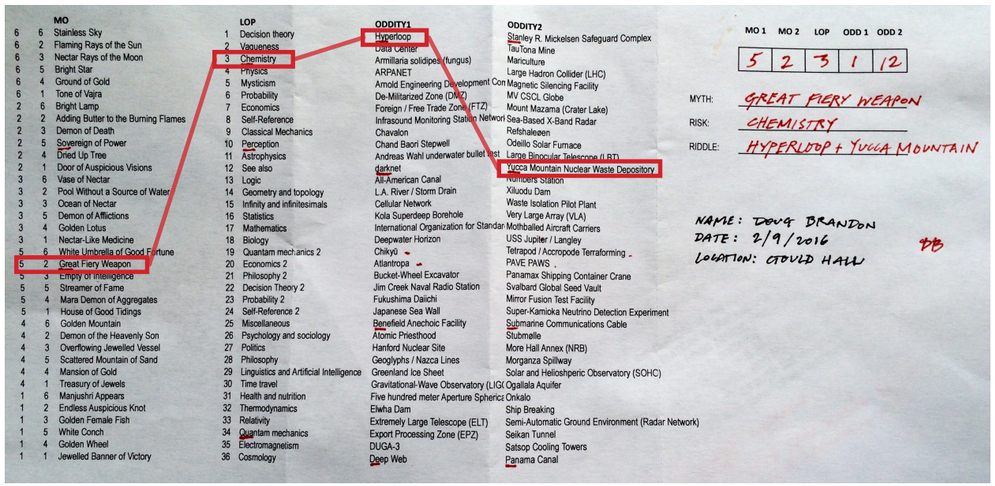




CHANCE OPERATIONS

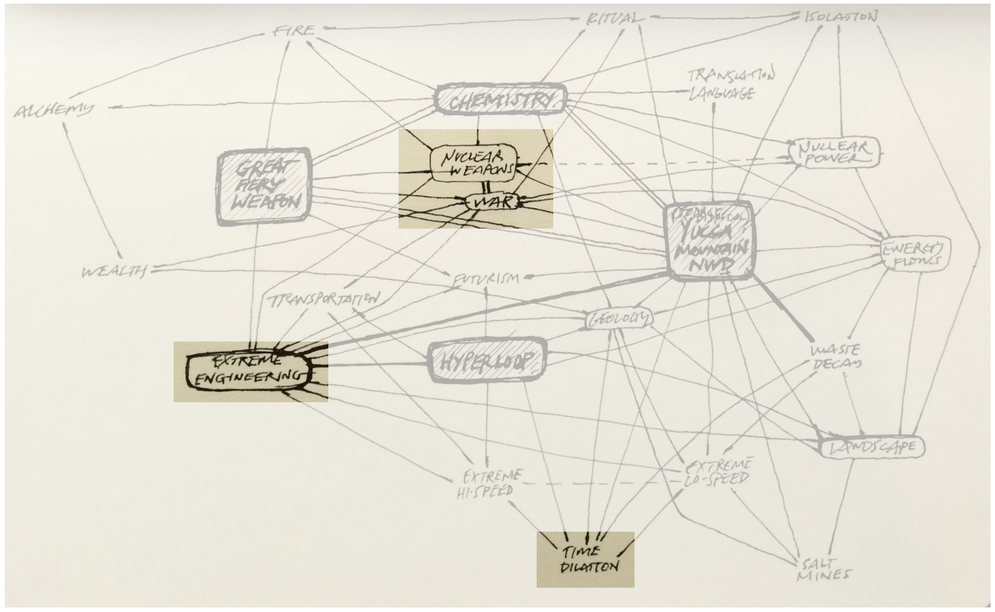
The first series of chance operations involves dice games. The list of disciplines and two lists of oddities are ordered using the results of chance-based dice wars waged against friends (who doubled as witnesses) over the course of several days. The communal activity is the first of several opportunities to involve unbiased outsiders in the project.



A Sentence

The second series of chance operations is a secret. Perhaps six people know even half of the details, and this is an essential component of the project. Secrecy creates interest, but also hints at the spirit of the thesis. This process, for the author, is not simply an academic endeavor, but a physical exercise involving the hard finality of cast dice, the gravity of the earth, and the sweat of a human. The ritual is conducted with solemnity in a semi-public place from midnight until 12:38 AM on 9 February 2016. Though at risk of disturbance from onlookers, none interfere. The results of the final ritual are used to read the lists, yielding one term from each and recorded in the author's hand here.

Great Fiery Weapon. Chemistry. Hyperloop. Yucca Mountain.



Without always describing specifically how, this sentence infects and inflects the thesis project at many levels. Generating many more questions than it answers, investigation morphs into interpretation, attempting to understand and yet never exhausting the many dimensions of this guiding sentence (in both senses of the word). The subsequent exercises, many of which are included in the appendix, span loosely architectural science fiction, essays, word diagrams, plainspeak definitions, and formal research.

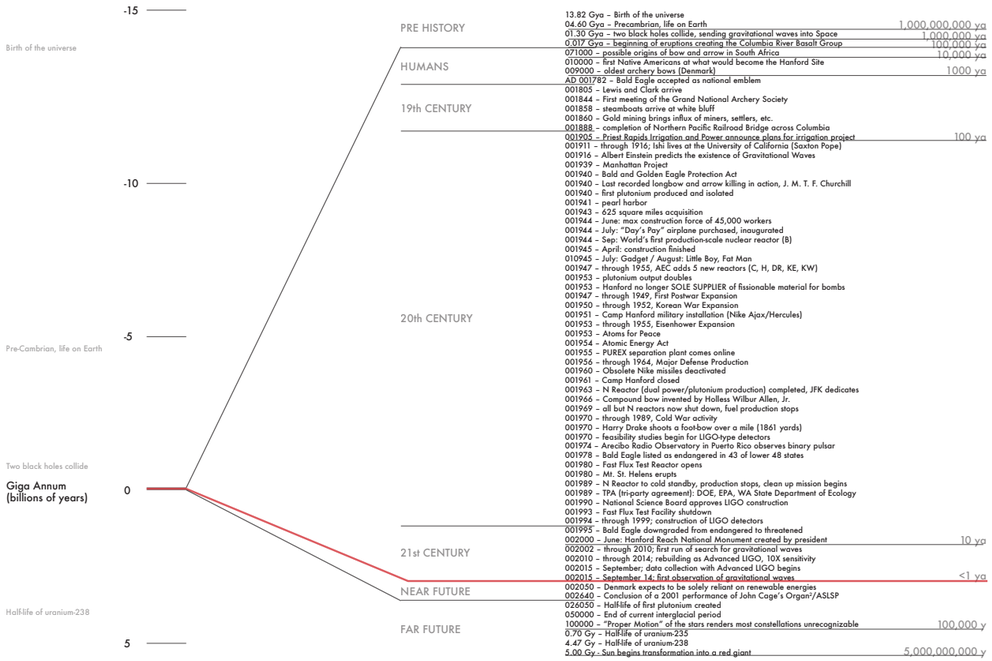
These explorations lead to Hanford Site. The four terms of the sentence converge around extreme engineering, nuclear power, large-scale control of environment and material, the dilation of time and space, systems thinking, transmutation, and alchemy. The place known to us as Hanford Site, or Hanford Nuclear Reservation, thanks to roles in Native American settlement, the atomic age, and current cutting-edge science, offers a unique vessel for unpacking *Great Fiery Weapon, Chemistry, Hyperloop,* and *Yucca Mountain*. Especially as related to architecture, the confluence of concepts becomes apparent as Hanford's strange histories unfold.

Think you of the fact that a deaf person cannot hear.

Then, what deafness may we not all possess?

What senses do we lack, that we cannot see and cannot hear another world all around us?

Frank Herbert [8]



19 billion year timeline

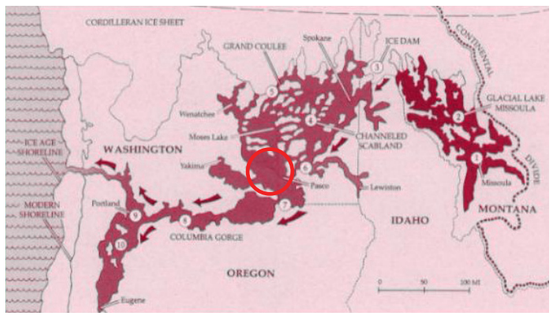
HANFORD SITE

To understand a place on Earth in ways that are most relevant to an atomic priesthood, this thesis engages several billion years of time, and the space of the observable universe. Organized accordingly in terms of time and space, this history of Hanford Site begins with nonhuman violence, and a vertiginous spatial analysis follows, challenging our comprehension of immensity.

TEMPORAL HANFORD

2.2 Gya (billion years ago), self-sustaining nuclear fission reactions occur naturally beneath what is now known as Gabon in Western Africa. Though weak, these reactions happen in ways very similar to modern breeder reactors. Though radioactivity is not unnatural, the concentrations of radioactivity present in modern nuclear reactors, and necessary to make nuclear weapons, has not been observed to occur naturally, at least on Earth. [9]

1.3 Gya, during the transition of animal life from to single- to multi-cellular, two black holes collide, sending gravitational shockwaves across the universe. Some will even reach Earth in time for the telling of this very story. Three more super-continents will coalesce and break apart before the rise of human civilization. [10]



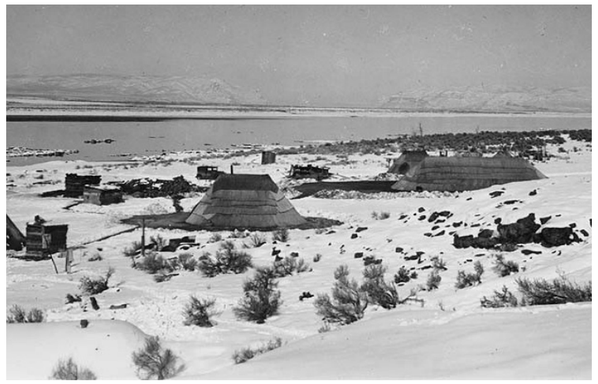
Columbia River Basalt Group
Missoula Floods

Unimaginably many years later, the Columbia River Basalt Group, a 210,000 square kilometer formation of Miocene-era flood basalt erupts, flows, and cools. During the 11 million years from 17 – 6 Mya, this formation of volcanic rock constitutes a new geologic foundation for much of what will be called eastern Washington, northeastern Oregon, and western Idaho. [11]

Some 13,000 years ago, a glacial ice dam breaks for the last of several tens of times, each unleashing an immense flow of water from Montana to the Washington coast. Containing an estimated 500 cubic miles of water, the ensuing Missoula Floods dramatically alter the Earth's surface one after another, depositing sediment across 3,000 square miles of the North American continent, carving new paths through the landscape, and creating temporary lakes where there were once deserts. [12] Bretz, for whom some geologists would have the floods named, illustrates a pattern of carnage:

Closed basins as deep as 135 feet were bitten out of the underlying basalt. Dozens of short-lived cataracts and cascades were born, the greatest of which left a recessional gorge, Upper Grand Coulee, 25 miles long. The greatest cascade was 9 miles wide. The flood rolled boulders many feet in diameter for miles and, subsiding, left river bars now standing as mid-channel hills more than 100 feet high. [13]

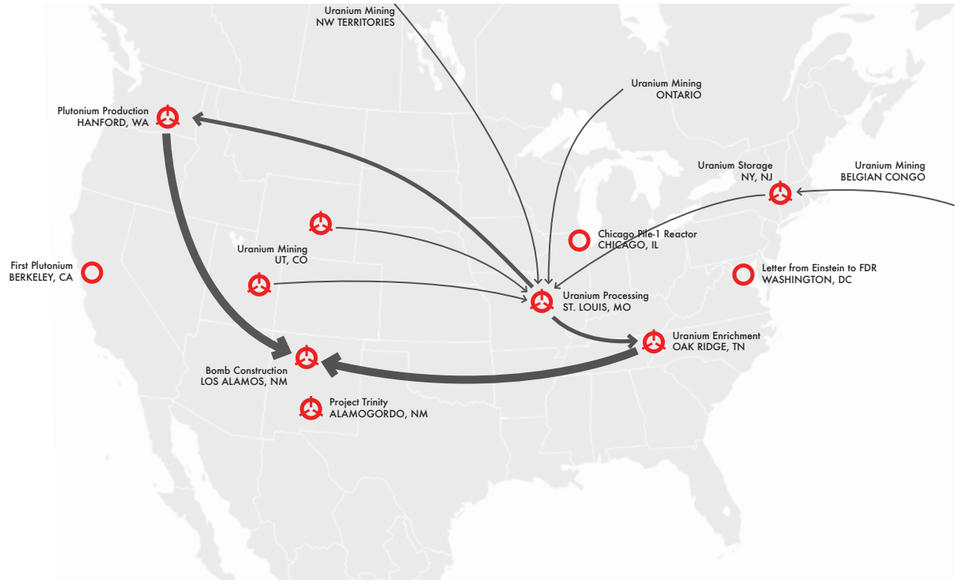
These cataclysmic events form another layer of geologic history, readily apparent to any student of stratigraphy.



Tule Huts; Hanford, WA
Hanford Townsite

As early as 12,000 years ago, Native Americans begin leaving surviving traces in what is now the Pasco Basin of Eastern Washington. The shrub-steppe ecosystem provides ample resources and wide variety of flora and fauna. The earliest inhabitants are likely foragers, hunting large mammals and supplementing their diet with small mammals, fish, and plants. The area is populated, albeit sparsely at first, as evidenced by archaeological sites of "permanent or semi-permanent habitation, typically associated with pithouse depressions" and a wide array of tools, vessels, and other artifacts of occupation. The pre-contact (with settlers) Native American population in the late-1700s is estimated to reach as high as 10,000, but experiences sharp decline and displacement thereafter. [14]

The arrival of Lewis and Clark in 1805 and the eventual gold rush of the 1860s bring swift changes to the landscape, due both to agriculture and industry, and population centers grow out of their demand. But the recent geologic study of the Columbia River Basalt Group and its various deformation due to the slow violence of plate tectonics intensifies in the early 1940's when the US Government begins searching for places to locate production facilities for a new, top-secret project. The selection process involves a wide survey of sites meeting a series of strict requirements, including: 12 by 16 miles in area, remote location, consistent water supply and hydroelectric power, access to transportation infrastructure, relative flatness, and readily available construction resources. In 1943, as part of the Manhattan Project, the federal government acquires and vacates 1,517 square kilometers in Eastern Washington, which includes the town site of Hanford. [15]



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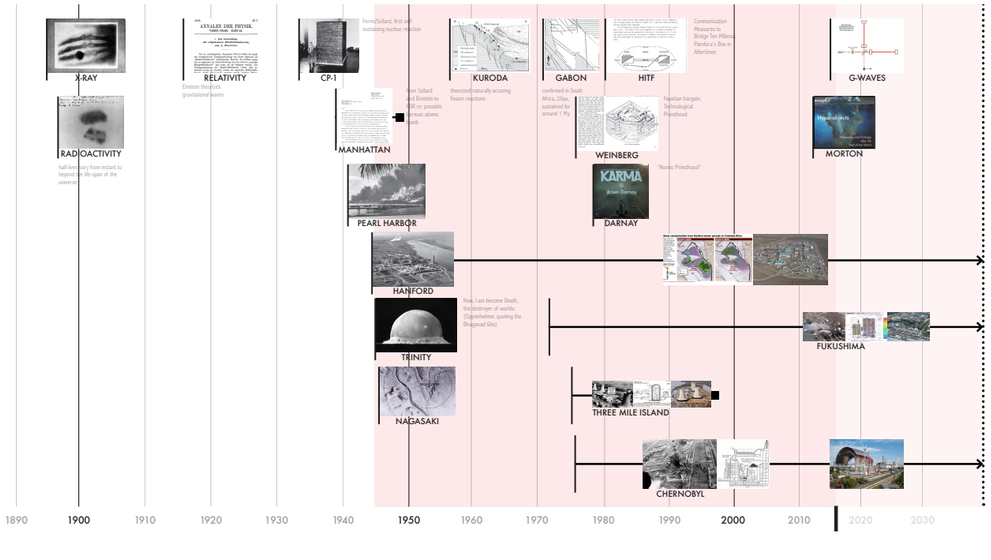
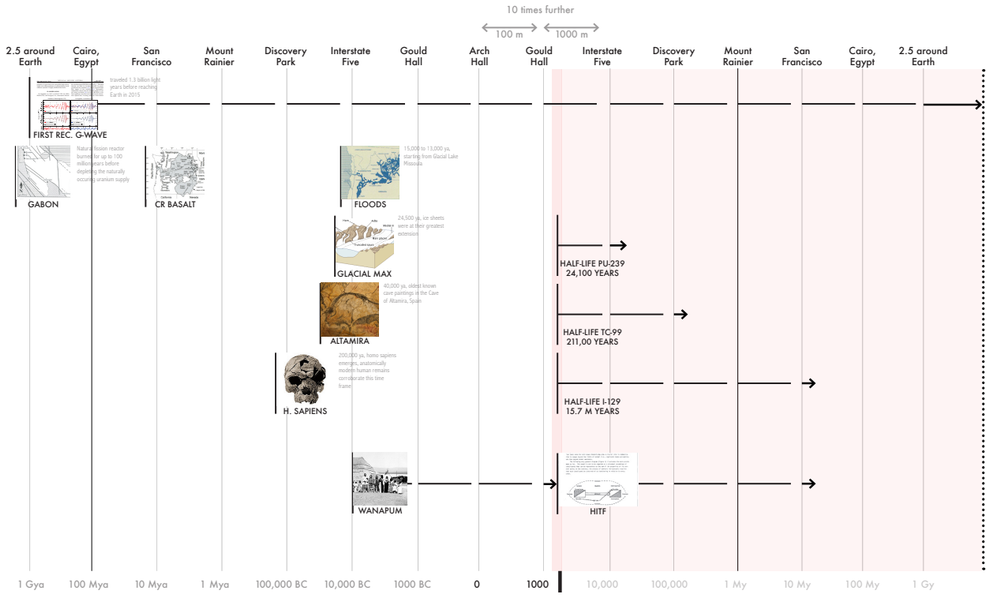
Trinity Test; 16 July, 1945

In the span of a few years, new breeder reactor technology developed by Enrico Fermi (the Chicago Pile) is immediately scaled-up at Hanford. The world's first large-scale plutonium production at Reactor B, now a historic landmark, embodies a new age of power and control, harnessing the potency of splitting atoms, likely absent on Earth since the natural fission reactions of Gabon. In 1944, Hanford Engineer Works sees a peak of 45,000 workers, many of whom, due to extreme rules about secrecy, don't know what they are producing. "Secrecy played a major role in the daily lives of employees on the Hanford site. They were told little to nothing about the project on which they were working, only that their work was going to help the United States win the war." [16] The first plutonium created from uranium at Hanford is used in both the Trinity Test (Gadget) and the bombing of Nagasaki (Fat Man).

Upon witnessing the Trinity Test, the detonation of the world's first atomic bomb, J. Robert Oppenheimer, a lead scientist in the Manhattan Project, recalls to himself from the Bhagavad-Gita, "I am become Death, the destroyer of worlds." [17] According to philosopher Timothy Morton:

The end of the world has already occurred. We can be uncannily precise about the date on which the world ended. […] It was April 1784, when James Watt patented the steam engine, an act that commenced the depositing of carbon in Earth's crust—namely the inception of humanity as a geophysical force on a planetary scale. Since for something to happen it often needs to happen twice, the world also ended in 1945, in Trinity, New Mexico, where the Manhattan Project tested the Gadget, the first of the atom bombs, and later that year when two nuclear bombs were dropped on Hiroshima and Nagasaki. These events mark the logarithmic increase in the actions of humans as a geophysical force. [18]





Linear Timeline; The Atomic Age
Logarithmic Timeline; 2 billion years

Following the end of the Second World War, five new reactors are added and production increases. The timeline follows pulsing cycles of activity and dormancy for several decades, most often related to the possibility of global violence. After expansion during the Cold War, Korean War, and even President Eisenhower's Atoms for Peace program, Hanford enters a period of cocooning and retirement, with the final reactor shut down at Hanford in 1987. [19] Plutonium production lasts until 1990 at the PUREX Plant, however, in 1989, the Tri-Party Agreement between the Department of Energy, the U.S. Environmental Protection Agency, and the Washington State Department of Ecology, shifts attention to clean up, restoration, and remediation. [20] Highly complex efforts continue today, hoping to ensure that the long-term effects of the American use of radioactive material don't threaten quality of life in the future. [21]

The unique qualities of this particular swath of volcanic landscape, coveted for its flatness and isolation, ultimately lead to yet another settlement and the search for Gravitational Waves. "In 1916, the year after the final formulation of the field equations of general relativity, Albert Einstein predicts the existence of gravitational waves…Einstein understood that gravitational-wave amplitudes would be remarkably small." [22] In 1970, scientists begin feasibility studies to build a Laser Interferometer Gravitational-Wave Observatory, and the project is approved for funding by the National Science Foundation in 1980. Sites are chosen in 1992, and two observatories are completed (one in Hanford, Washington and another in Livingston, Louisiana) in 1999, in cooperation with MIT and Caltech. The first data collection period runs from 2002 until 2010 with no significant detections. After a period of maintenance and a 2014 reopening, Advanced LIGO is 10 times more sensitive, granting access to a volume of space 1,000 times larger. [23]

Essentially, LIGO is an enormous, extremely sensitive interference detector. Engineer, physicist, and former researcher at Hanford LIGO Tom Mahood simplifies:

An interferometer takes a laser beam, splits it in two and sends it down two legs at right angles to each other. At each end of the legs are mirrors, which bounce the beams back to the center. If there's any difference in the leg length, say caused by the passing of a gravity wave, the two recombined laser beams create an interference pattern. [24]

After Einstein's forecast about 100 years ago, and just days after restarting the LIGO detectors, scientists record the first observable Gravitational Wave on 14 September 2015. As reported in the New York Times, the audible signal escalates "to the note of middle C before abruptly stopping…destined to take its place among the great sound bites of science, ranking with Alexander Graham Bell's 'Mr. Watson – come here' and Sputnik's first beeps from orbit." [25] Participating scientists testify in Congress on 24 February 2016 that the Gravitational Wave has finally been observed.

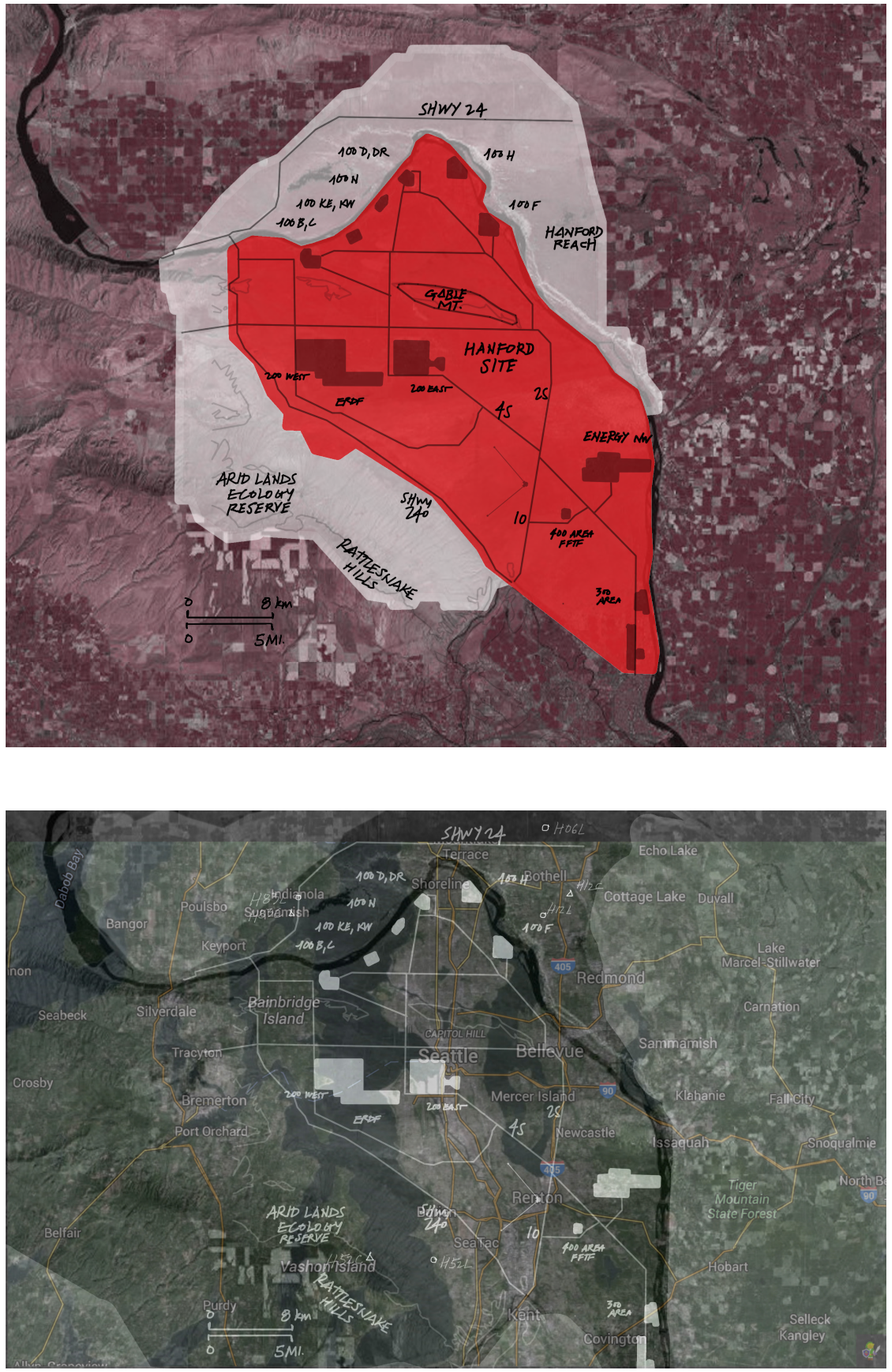
The device is so sensitive, it must be able to detect the movement of a test mass (very heavy, nearly perfect mirror) at an unimaginably small scale: 1.0e-19 meters. This is 1/1000th the width of a proton. The architectural quality of this building as instrument, then, is otherworldly, in many senses. The detector has two locations in order to account for vibration from local phenomena (weather, tectonic activity, passing vehicles) and these twins are almost 2,000 miles apart. The devices are clones of one another, and each has a pair of arms at a right angle, each 4 km in length, enclosing 10,000 cubic meters and built of 3 mm thick steel. Air is removed from the tubes until the internal pressure is nearly a perfect vacuum (one-trillionth of an atmosphere), protecting the lasers from encountering any stray protons or particles. 341-million pounds of air press down on each of the 4 km arms, so long that one end of each must be an extra meter further from the ground to correct for the curvature of the earth. [26]

Lastly, as noted on the LIGO website, "About 40 people work at each observatory site, including engineers, technicians, and scientists who keep the instruments operating, and who monitor vacuum and computer systems around the clock. Administrative and business staff are also present, as are education and public outreach professionals who conduct public tours, facilitate field trips for local students, and arrange periodic public events." [27] This is simultaneously an incredibly sophisticated listening device, workplace, business, lab, machine shop, and school.

Though highly abstract in function and mission, real humans operate this landscape instrument and its supporting armature on a daily basis. According to Ed Daw of the University of Sheffield, a gravitational wave researcher, fine positioning and calibration of LIGO instruments was once completed by hand. As Daw explains, "mirror positions and angles tend to drift slowly due to temperature changes, mechanical relaxations in the hardware, and even the position of the moon in the sky, so adjusting the mirrors is a daily task." Scientists constantly monitor the landscape-scale instrument for the smallest changes, which threaten to misalign, delay, and invalidate the results of the experiment. [28]

Tule Huts
Cocooned Reactor
LIGO

This understanding of site history reveals three energy systems, or ways of knowing. Thousands of years of Native American occupation represent a light footprint on the land and a mythical understanding of waste cycles. High individual risk and low levels of control pervade a semi-nomadic existence. Nuclear production signifies a shift to the geopolitics of nuclear threats and the accompanying population-level calculus of war. Extreme control, with its accompanying risks, belies the long-lived dangers of byproducts produced in haste. Finally, the LIGO experiment is in danger of disturbance from human interference, and extreme measures are taken to protect it. Hyper-control of environment and parameters with little risk, beyond financial, mark a reverence for the unknown and the human ability to innovate, discover, and reach beyond what seems possible.



Site Boundaries
Seattle Overlay, for Scale

SPATIAL HANFORD

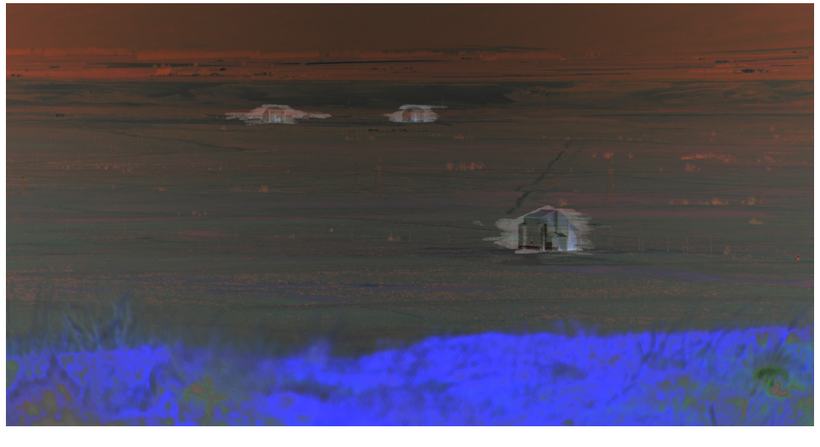
Yet as a whole, the site is vast and unknowable; at least in the way that one might study an urban parcel. There is wilderness between paved areas. Elk roam the expanse. Empty space itself serves as security in many cases. In one series of maps featuring many layers of high-level information, we realize that the site could contain all of Seattle from Shoreline to the Airport, easily covering the space from Bainbridge to Bellevue. Largely flat, with several marked elevation changes and the edge of a basin always visible, emptiness swallows visitor, animal, and infrastructure alike. However, with the history of place in mind, a series of exercises illuminates what might otherwise be hidden here.

Growth, Infrastructure, Speed

Though immense, the site is marked with signs of the human scale. Whether in trees, evidence of a thriving ecosystem; in power lines and construction revealing ongoing reparative work; or in the slow passing of vehicles, marking a pace and intensity fitting for a desert; the site is filled with clues and the visible components of distributed, largely hidden systems (river ecology, power, construction fleet). Though serving as markers of size, the site is nearly impossible to condense or grasp.

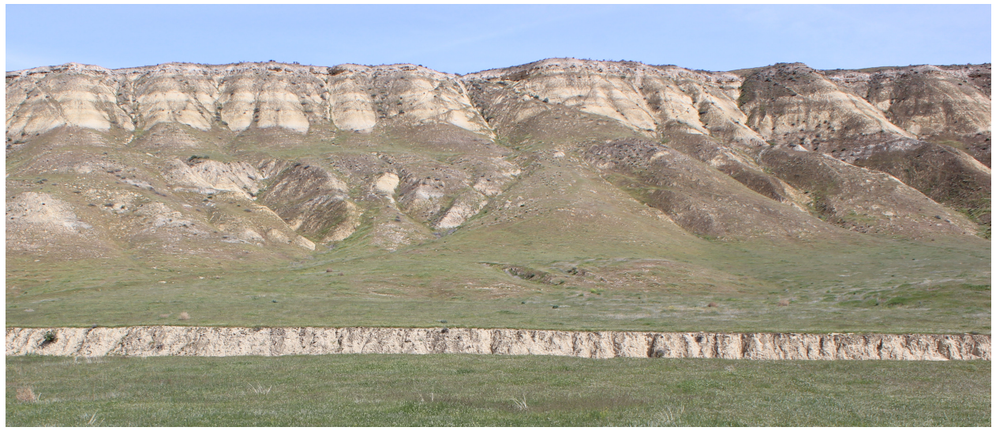
As a hiker, one merely notices the static horizon and immovable reference points. Though noticeably progressing in a local sense, the scenery never really changes, and the stagnant perspective of distant objects underscores their distance and gravity. The wind, besides the crunch of gravel underfoot, is a singular and essential reminder of atmosphere – that there is air here at all. The openness speaks of freedom and pioneering, but the border of the river and the presence of unspoken inviolable boundaries immediately counteracts this feeling.

Discovered individual artifacts belie complex predator-prey relationships related to both global and local conditions. Discarded sheet metal and fungus highlight other systems interacting at various scales, but always coexisting in both finite and infinite frames of reference.



Cocooned Reactors
Author's edit
Author's edit

Cocooned reactors speak of erasure, asking: is it possible to reverse what happened here? Can we conceive of a return to something natural absent traces of violence?



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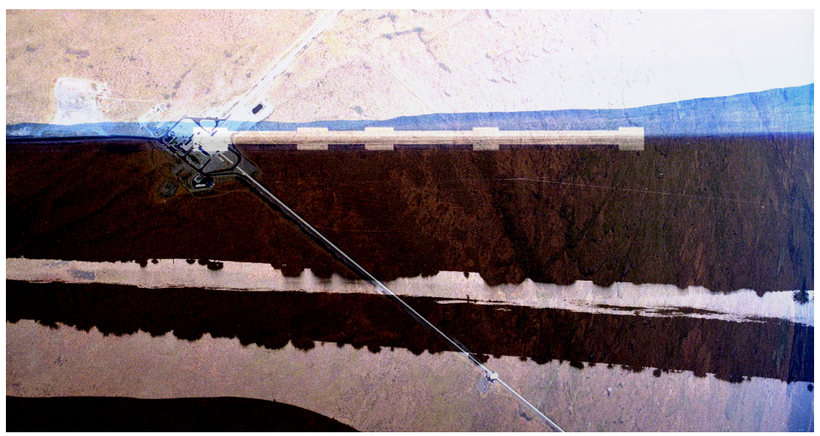
Former Hanford Town Site

A condensation of the distant and the immediate introduces mind-bending illusion. Vertical kilometer-long stretches of straight highway compare in size to centimeter-tall messages scrawled in sedimentary rock formations. The layered and sculpted softness of nearby hilltops contrasts with a roadway, cut into the green plains below it. Contradictory traces of a former military camp overlie an all but erased town site, leaving the lone skeleton of a high school as evidence.

There is natural, pastoral, romantic beauty here. We experience depth and atmospheric color, hidden vastness, and an unrelenting horizon. We grant equal weight to the flower and the cloud.



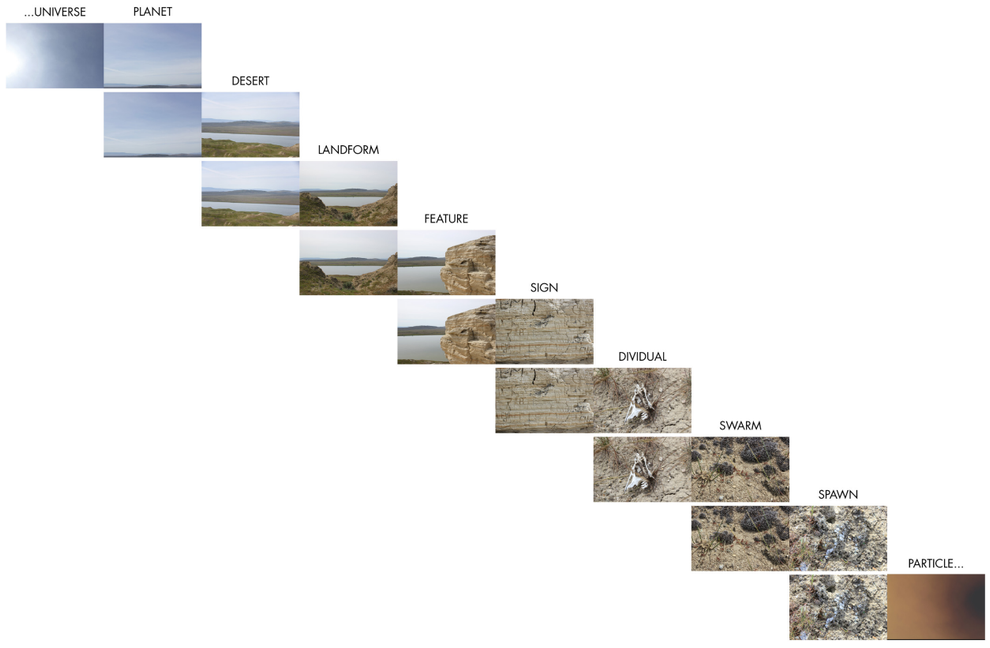
Spatial Dilation
Author's edit
Author's edit

LIGO, in its impossible engineering, is easily dwarfed by distance. Seen obliquely, its 16 square kilometers register in a three-pixel-high row across this image. The myopia of a single point of view fails to capture or even suggest the ambition embodied here.

Author Hiking: Hanford Reach

The author's site visit heavily influences conceptions of space and time used in this thesis. From a recording created on site in the author's voice:

The Hanford Reservation is what some would call a wasteland. An expanse isolated in its context and filled with negative things: waste, pollution, contamination, wasted buildings, wasted investment. But in fact, scientists are using LIGO to listen into the future, push our understanding of the world, and expand our ways of knowing. In a sense, this is a return to an archaic way of living in the land, where taking advantage of a site is not just about location but about systems and ecologies and possibilities that exist in a place. This proposal is a way of challenging the conception that this site should be remembered as a lesson for history, and cleaned up. Instead, this site should be harvested in a way that doesn't destroy it, but augments it. There are incredible architectural qualities here. Time is on display. The layering of sediment and basalt floes form a beautiful relationship between the relatively permanent and the relatively impermanent, basalt being long-lived yet susceptible to erosion, and sediment being an embodiment of erosion itself, always nomadic and on the move. It takes forever to walk anywhere here. You can see a place and spend all day walking to it. We are small, as individuals and even as groups. The effects we can have on the landscape are great, but they are not so great that the landscape won't eventually overcome us. Being on the site, it seems the only way to respond to such an amazing scale is to challenge ideas of scale itself. The only way to respond to such a harsh climate is to challenge our concept of human climates. What is climate control? We should challenge these ideas in a risky way. How can we challenge architectural conceptions of control and risk in a landscape that is so apparently affected by time and scales that are out of our control?



Understanding Hanford Site challenges scalar agility in both time and space, demanding a facility for navigating the immense and the miniscule, superimposed and coexistent. Because of its temporal qualities and intended endurance, an atomic priesthood should benefit from this expanded perspective of time and place, as they relate to sub-atomic particles, blood cells, bodies in motion, celestial mechanics, and the universe.

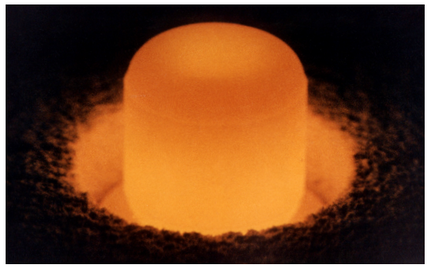
[the mathematical] is just mathesīs,

which is a Greek term that comes close to the Tibetan gom, the term for meditation.

Gom and mathesīs both mean something like "getting used to," "growing accustomed."

Mathematics in this sense, beyond number, is the way the mind acclimatizes itself to reality

Timothy Morton [29]



Plutonium; Half-Life 24,110 years

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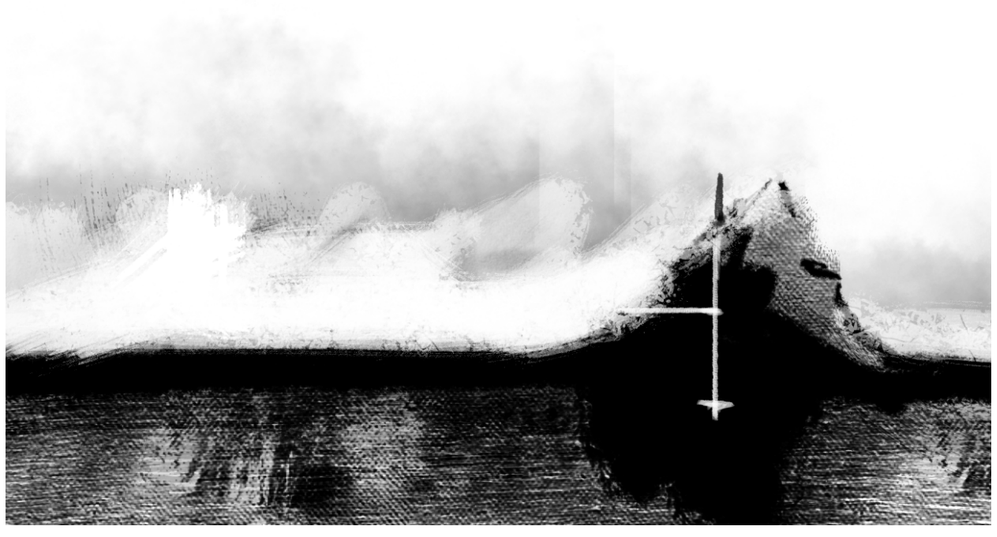
THE ATOMIC PRIESTHOOD

While facilitating the mission of atomic guardians, aiming for vigilance and longevity, could architecture help translate between the instantaneous and the infinite? What architectural and social formations must exist to mediate between the fleeting life of the individual and the ancient lives of stars? What power does architecture have when time-scales approach the unfathomable? These questions are examined in terms of two lineages – a temporal history of the atomic priesthood and a spatial rewriting of its future at Hanford Site.

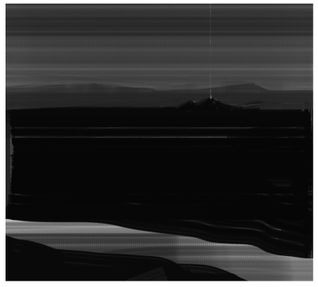


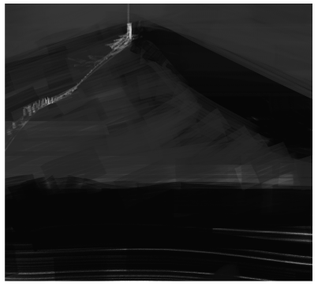
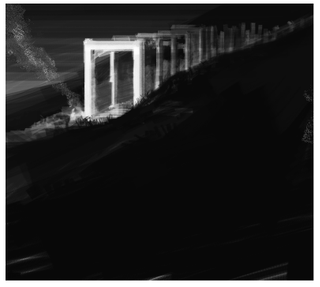
LINEAGE IN LITERATURE

Radioactive elements, in the concentrations present as a result of nuclear weapons production, are hazardous to life in an invisible and long-lasting way. Though radiation can't be seen or felt, its effects can be devastating. Ideas about an atomic priesthood, as a way of dealing with these realities, surface in writing as early as 1971, with mixed amounts of mockery and sincerity. Then Director of the Oak Ridge National Laboratory Alvin Weinberg writes:

We nuclear people have made a Faustian bargain with society. On the one hand we offer - in the catalytic nuclear burner (i.e., the breeder) - an inexhaustible source of energy. Even in the short range, when we use ordinary reactors, we offer energy that is cheaper than energy from fossil fuel. Moreover, this source of energy when properly handled is almost nonpolluting. Whereas fossil-fuel burners emit oxides of carbon, nitrogen, and sulfur...there is no intrinsic reason why nuclear system must emit any pollutant except heat and traces of radioactivity. But the price that we demand of society for this magical source is both a vigilance from and longevity of our social institutions that we are quite unaccustomed to. [30]

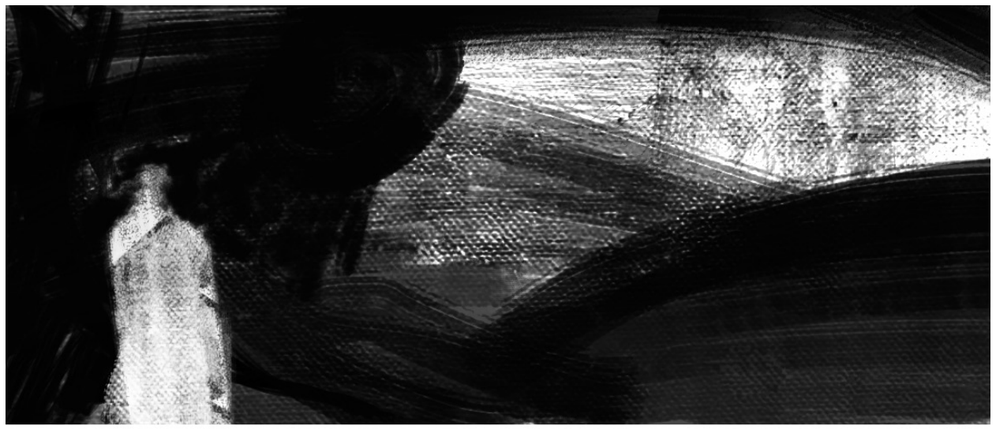
Weinberg reviews possible methods for storing dangerous nuclear waste, and argues that the best schemes actually avoid the need for "keeping a priesthood that forever reworks the wastes or guards the vaults."



Soon after, science-fiction author Arsen Darnay writes mockingly in Karma: A Novel of Retribution and Transcendence:

'An atomic priesthood to watch the wastes – for crying out loud,' Jack thought. The elevator doors slid shut, hiding Aspic from view. Jack shook his head and turned toward the men's room down the hall. 'What'll they come up with next? I can see them – on their knees before an altar, and on the altar a glass bubble filled with Plutonium-239. How can a grown man even think such foolishness…' [31]



Thomas Sebeok writes most directly and extensively on the subject as a part of the Bechtel Working Group, the Human Interference Task Force, and in a German Journal of Semiotics. Specifically, the Human Interference Task Force is assembled in 1981 to address the problem of communicating into the future about nuclear waste. Published first in draft form as a technical report, and ultimately as a chapter called "Pandora's Box in Aftertimes" from his collection of essays, *I Think I Am a Verb*, Sebeok writes:

…my services were engaged by the Bechtel Group, Inc., as a consultant to the Human Interference Task Force, assigned responsibility for 'reducing the likelihood of future human activities that could affect geological high-level waste repositories.' […] [the following article] contains solely my personal views on the specific problem on which I was asked to work: designing a reasonably fail-safe means of communicating information about the repository and its contents, such that the system's effectiveness would be maintained for up to 10,000 years. The 10,000 years limitation forecast—roughly equivalent to 300 generations, according to current actuarial tables—is clearly an arbitrary limit…one must nevertheless be mindful that the radioactive half-life of, for example, the metal thorium 232 is 10 billion years… [32]

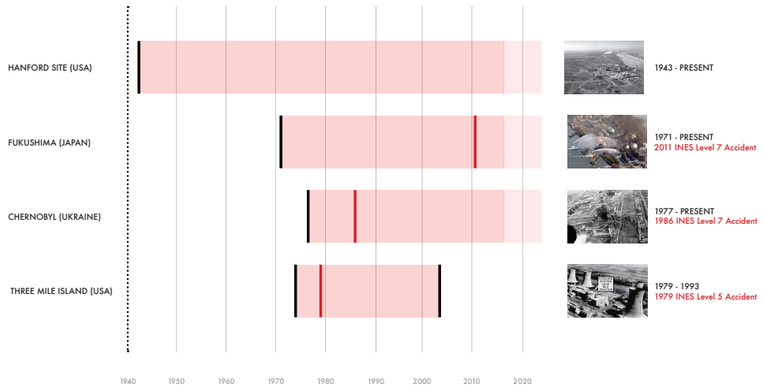
and from the initial draft report, following a discussion of the myth of Pandora's Box:

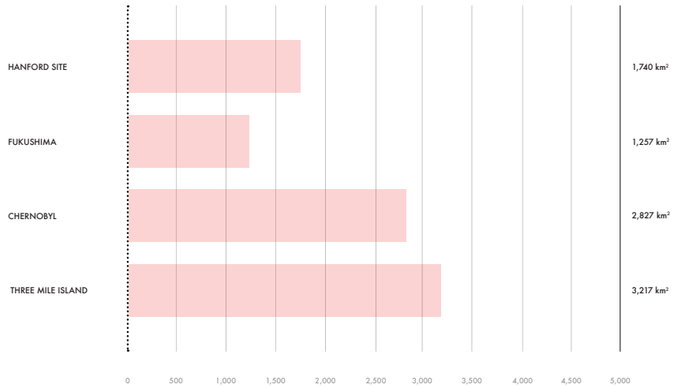
These persistent and widely diffused mythological and iconographic resonances of the assignment to which the Task Force is seeking a resolution lead to the first recommendation, to wit: that information be launched and artificially passed on into the short-term and long-term future with the supplementary aid of folkloristic devices, in particular a combination of an artificially created and nurtured ritual-and-legend. The most positive aspect of such a procedure is that it need not be geographically localized, or tied to any one language-and-culture […] The legend-and-ritual, as now envisaged, would be tantamount to laying a "false trail", meaning that the uninitiated will be steered

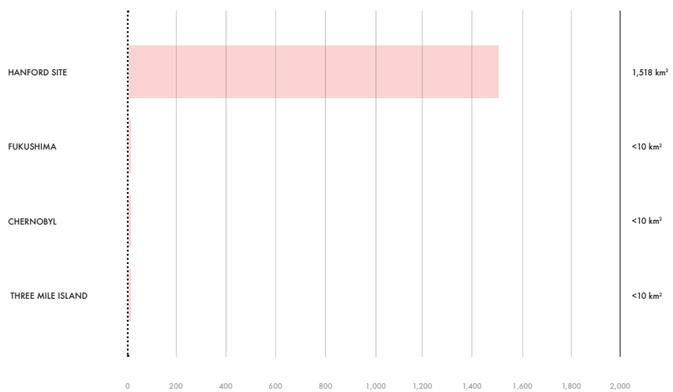
away from the hazardous site for reasons other than the scientific knowledge of the possibility of radiation and its implications; essentially, the reason would be accumulated superstition to shun a certain area permanently. A ritual annually renewed can be foreseen, with the legend retold year-by-year (with, presumably, slight variations). The actual 'truth' would be entrusted exclusively to – what we might call for dramatic emphasis – an 'atomic priesthood', that is, a commission of knowledgeable physicists, experts in radiation sickness, anthropologists, linguists, psychologists, semioticians, and whatever additional expertise may be called for now and in the future. Membership in this 'priesthood' would be self-selective over time. [33]

Sebeok's conception of the atomic priesthood is one of secrecy and power. Interestingly, the rituals he suggests aren't necessarily tied to place. However, long-lasting social organizations without links to at least one physical location are rare. Even distributed abstractions like websites and stock markets have physical instantiations (server farms, data centers). Further, Sebeok's ideas about secrets are dependent on deception. His priesthood would mislead the public to believe that the areas in which nuclear wastes are buried are simply haunted. Presumably, critical knowledge would be held dangerously in the hands of a privileged few.

Contemporary philosopher Timothy Morton comments directly on this very subject several times in his Object-Oriented Philosophical approach to what he terms Hyperobjects, objects (such as global warming or radioactive elements) so massively distributed in time and space that we never comprehend them fully, and feel their effects as if we were a part of their past. He argues, "Far, far more effort must be put into monitored retrievable storage than Thomas Sebeok's disturbing idea of an 'atomic priesthood' that enforces ignorance about the hyperobject in question," namely, dangerous concentrations of radioactivity. He suggests we should closely consider the approach of the Nuclear Guardianship movement, for example, which proposes the curation of nuclear waste, allowing the material a public place in society, if not literally, at least metaphorically. Visibly acknowledging and protecting waste until it becomes inert or can be repurposed is most tenable, in his view. [34]

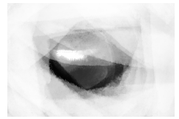






History
Restricted Area
Current Area

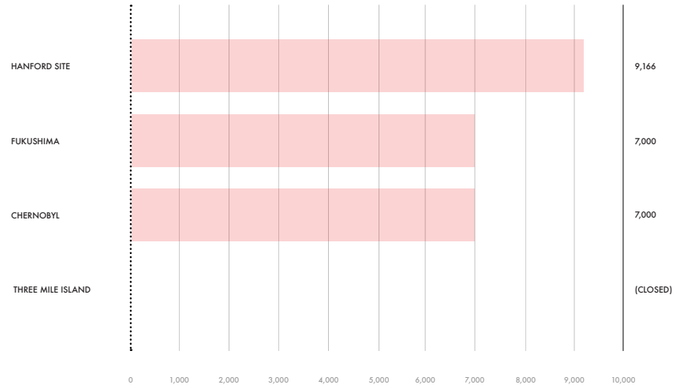
Influenced by and accommodating all of these sources, the thesis proposes an atomic guardianship that exists in the public eye, but with a certain necessary level of secrecy.

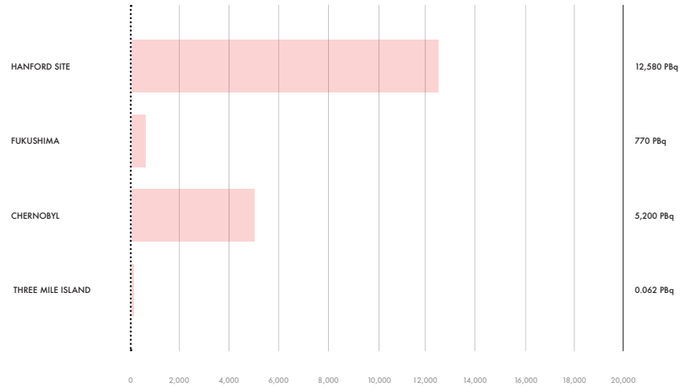


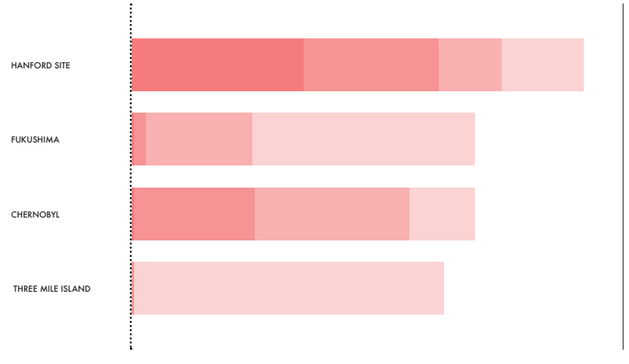
LINEAGE AT HANFORD

An overlay of data related to three of the most well-known nuclear disasters becomes a way of recognizing just how well Hanford embodies issues about communication and nuclear waste. In one sense, the sheer amount of analysis and information generated at Hanford Site attests to its complexity. But the memorable incidents at Three Mile Island in Pennsylvania, Chernobyl in the Ukraine, and Fukushima in Japan offer illuminating comparisons to Hanford in terms of time, size, and cumulative impact. Though probably less present in the collective memory, Hanford actually represents a monumental part of the history and future of the nuclear age.

Firstly, the timeline of Hanford stretches back to 1943, while the three disasters' facilities only date back to the 1970's. With a production timeline spanning six decades, Hanford simply offers more complication in its several eras of technology and long history. Though the restricted areas of Chernobyl and Three Mile Island are larger than Hanford Site on the day of meltdown, the current restricted area and clean up effort at Hanford is larger by several orders of magnitude. The complexity of clean up at Hanford Site cannot be underestimated. In 2016, there are 7,000 people working to clean up infrastructure and landscape at Chernobyl and Fukushima. 9,166 employees work at Hanford, and at its peak in the 1940's, there are nearly 50,000 people living in the area and working on site. [35] [36]







Current Workforce
Radiation Released
Cumulative Impact

Finally, the radiation released into the environment at Chernobyl is less than half that of Hanford, and the Hanford figure doesn't include the nuclear waste stored there today. [37] [38] [39] In the words of Merilyn Reeves, former chair of the Hanford Advisory Board:

I'm often asked why it has taken so long to clean up and stabilize Hanford's radioactive and hazardous wastes. These queries generally come from individuals who have never seen the site, cannot envision the size and complexity of its buildings and their contents, and have little understanding about the short and long-term risks to workers, the public, or the environment. [40]

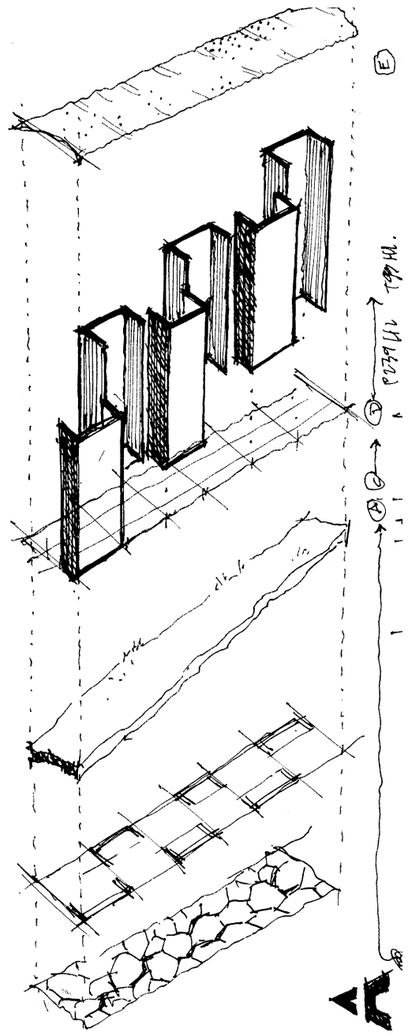
Acknowledging Hanford's intricacy and relevance to a conversation about storing nuclear waste, this thesis advances with a measure of awe. Regardless of the approach, this singular place demands our respect, admiration, and attention. No one solution is possible at Hanford – this site admittedly requires many more years of reparation. However, within geologic time scales, this project poses questions about architectural endurance, hoping to deal, not with the technical complexity of the site, but with its mythical, human components. The collective memory must be maintained. Even now, many fail to recognize the gravity of Hanford, instead hearing the occasional story of tank failure or minor accident, but maintaining a healthy distance from its realities. But an atomic priesthood would coexist with and depend on these facts. The design for their monastery, then, should offer ways of mediating or translating between the instant and the infinite. It should connect the fleeting life of the individual with the ancient lives of stars.

A path is always between two points, but the in-between has taken on all the consistency

and enjoys both an autonomy and a direction of its own. The life of the nomad is the intermezzo.

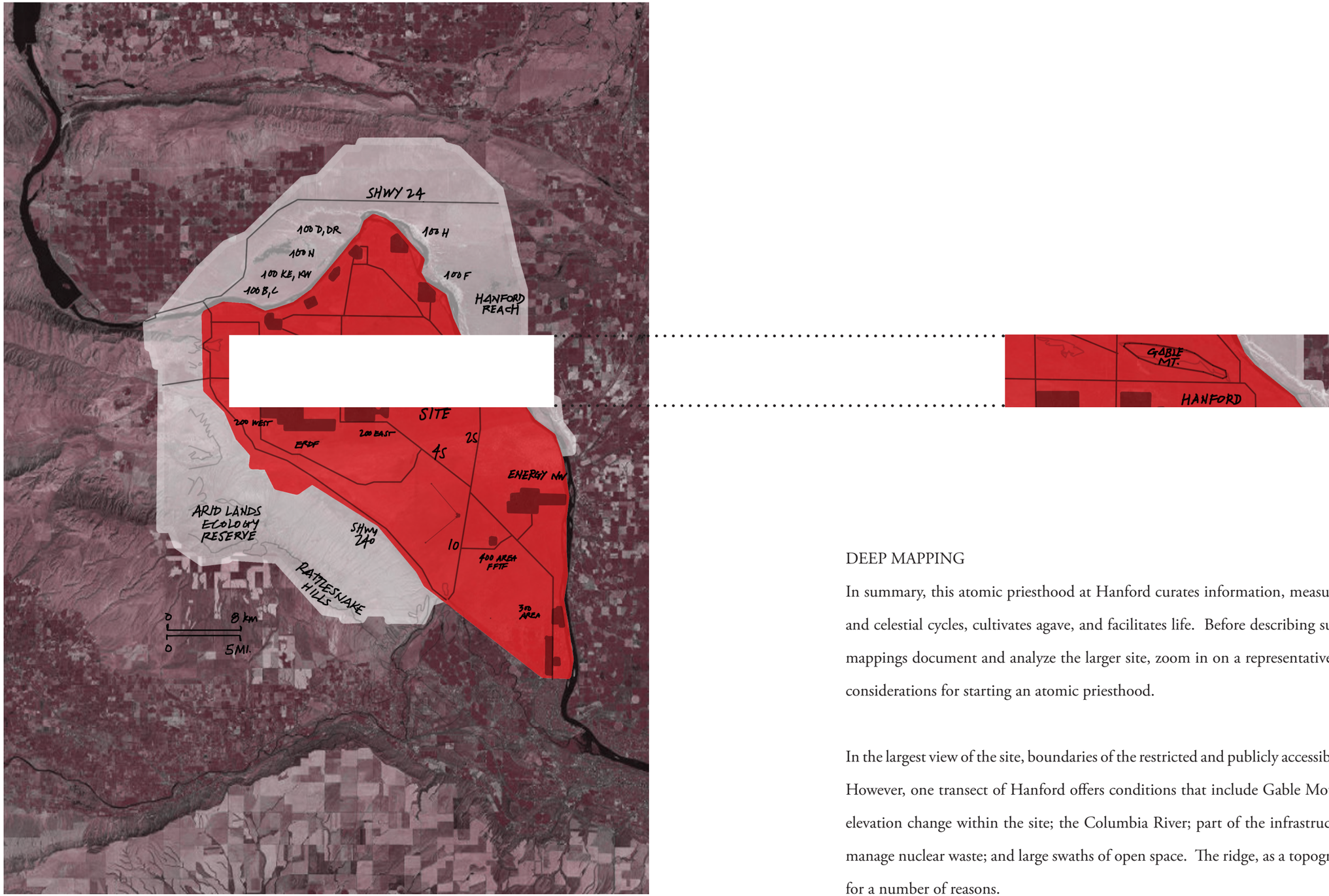
Even the elements of his dwelling are conceived in terms of the trajectory that is forever mobilizing them.

Gilles Deleuze and Félix Guattari [41]



MEASURES (A MONASTERY)

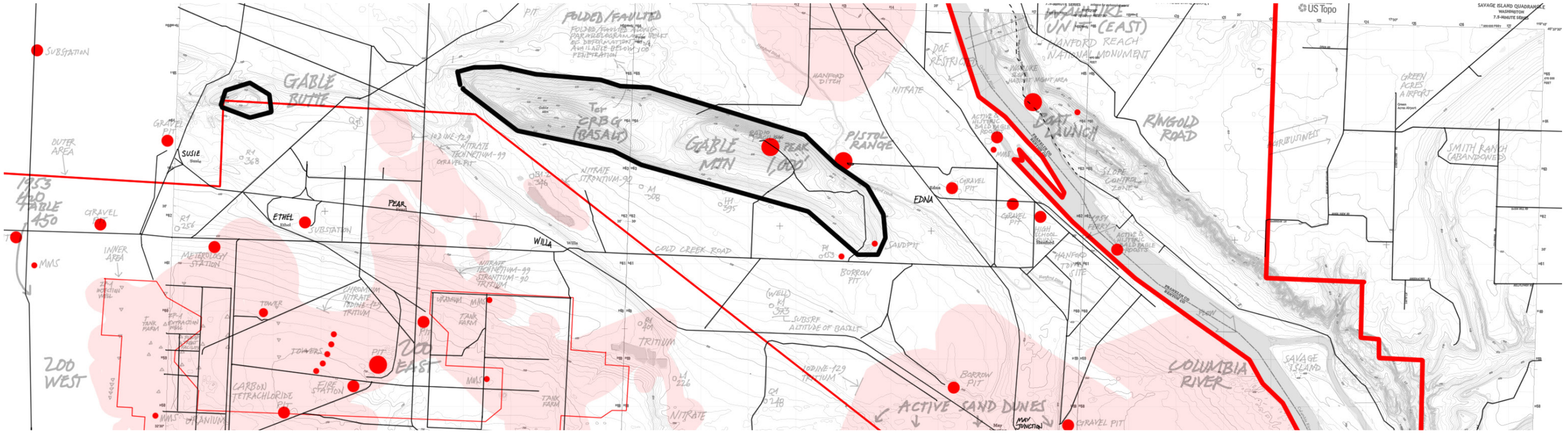
Measures imagines a monastery for an atomic priesthood at Hanford Site, or alternatively, a skeleton for nuclear curation. The project, born of divination and the connections it generates, offers a way of imagining the guardianship of nuclear waste at multiple scales and intensities. By reflecting cycles of growth and regeneration with the perspectives the supporting analysis suggests, perhaps architecture can connect human size and duration with long periods of shifting planetary magnetism, celestial mechanics, and radioactive half-lives. After a series of mappings, describing why the chosen site is optimal, the graphics describe a phased implementation. In the span of several decades, the early members of the priesthood establish the cultivation of agave and begin a migration from the ridge to the vault. Though perhaps never reaching the goal, the priesthood builds one new module of the migration every century, adapting living spaces within the structure and continually measuring one awesome cycle or another while bodily perpetuating information about nuclear waste.



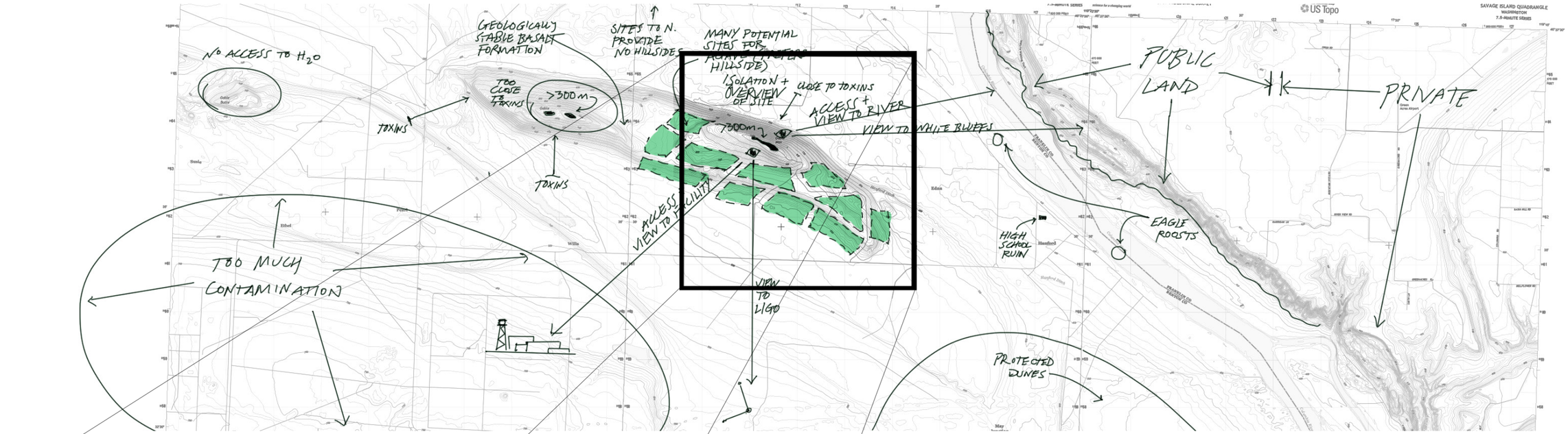
DEEP MAPPING

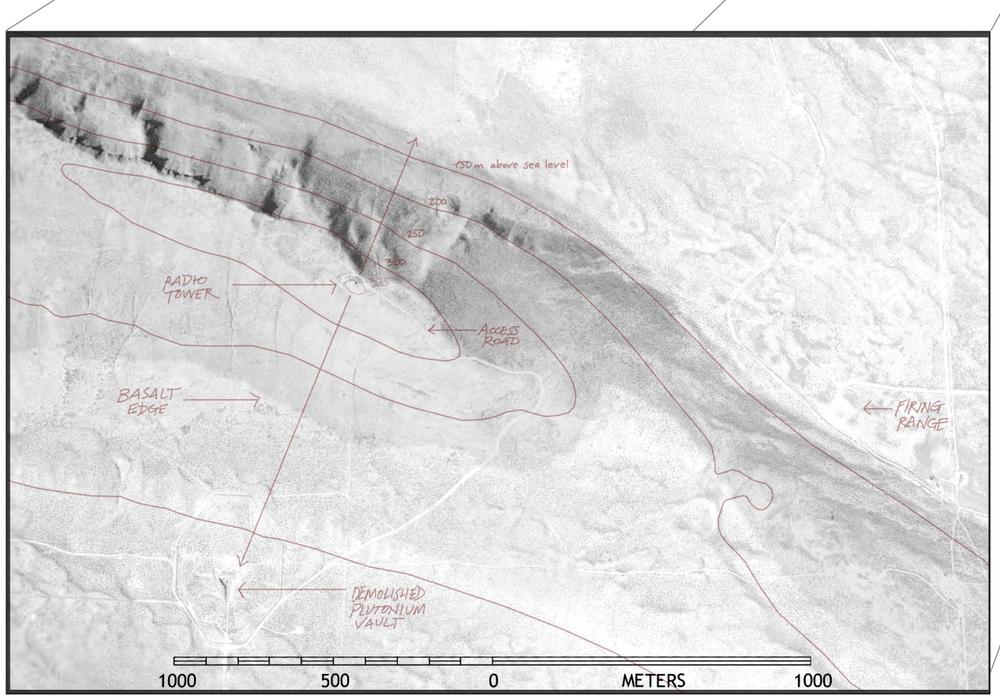
In summary, this atomic priesthood at Hanford curates information, measures long-period planetary and celestial cycles, cultivates agave, and facilitates life. Before describing such a program, a series of mappings document and analyze the larger site, zoom in on a representative transect, and note some considerations for starting an atomic priesthood.

In the largest view of the site, boundaries of the restricted and publicly accessible areas become apparent. However, one transect of Hanford offers conditions that include Gable Mountain, the most extreme elevation change within the site; the Columbia River; part of the infrastructure currently helping to manage nuclear waste; and large swaths of open space. The ridge, as a topographic feature, is desirable for a number of reasons.



First, as the distilled mappings show, groundwater contamination is relatively widespread. For a monastery intending to grow plants for consumption, the ridge offers untainted topsoil and water from both rainfall and basaltic wells. Further, the ridge offers an overview of the site, including LIGO to the South, nuclear facilities in every direction, the old Hanford town site, and the Columbia River. Claiming high ground affords a measure of metaphorical security and maximizes literal visibility. Lastly, the elevation makes the site safer than low-lying areas in the case of a major flood.


NO ACCESS TO H_2O
GEOLOGICALLY STABLE BASALT FORMATION
TOXINS
TOO CLOSE TO TOXINS
>300m
TOXINS
SITES TO N. PROVIDE NO HILLSIDES
MANY POTENTIAL SITES FOR ACRYL TANKS HILLSIDE)
ISOLATION + OVERVIEW OF SITE
CLOSE TO TOXINS
ACCESS + VIEW TO RIVER
VIEW TO WHITE BLUFFS
300m
ACCESS VIEW TO FACILITY
TOO MUCH CONTAMINATION
VIEW TO LIGO
PUBLIC LAND
PRIVATE
HIGH SCHOOL RUIN
EAGLE ROOSTS
PROTECTED DUNES
US Topo
SAVAGE ISLAND QUADRANGLE
WASHINGTON
7.5-MINUTE SERIES


150m above sea level
200
250
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RADIO TOWER
ACCESS ROAD
BASALT EDGE
FIRING RANGE
DEMOLISHED PLUTONIUM VAULT
1000
500
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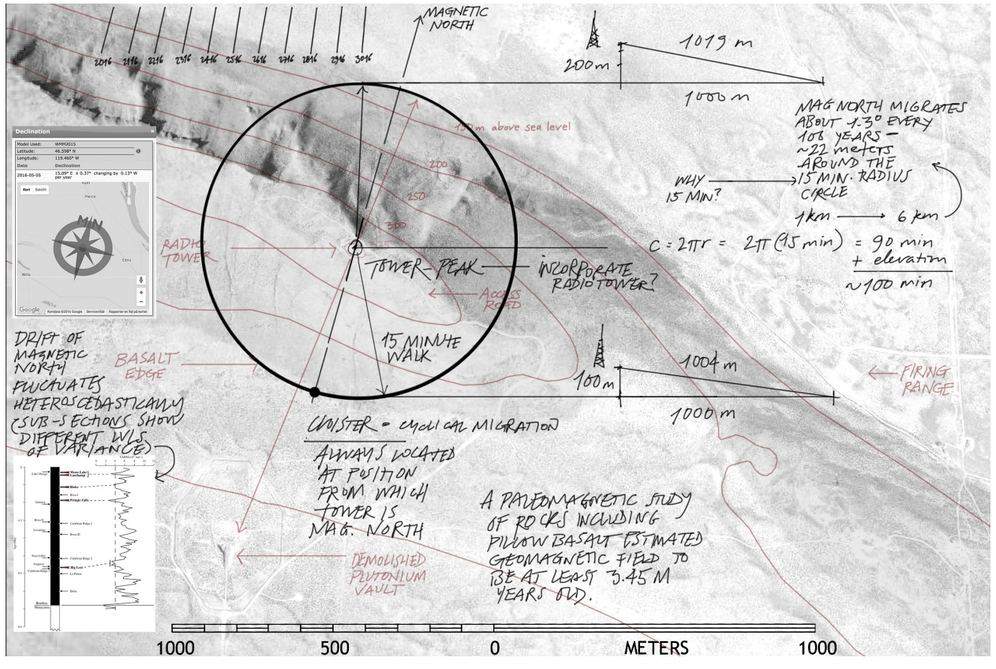
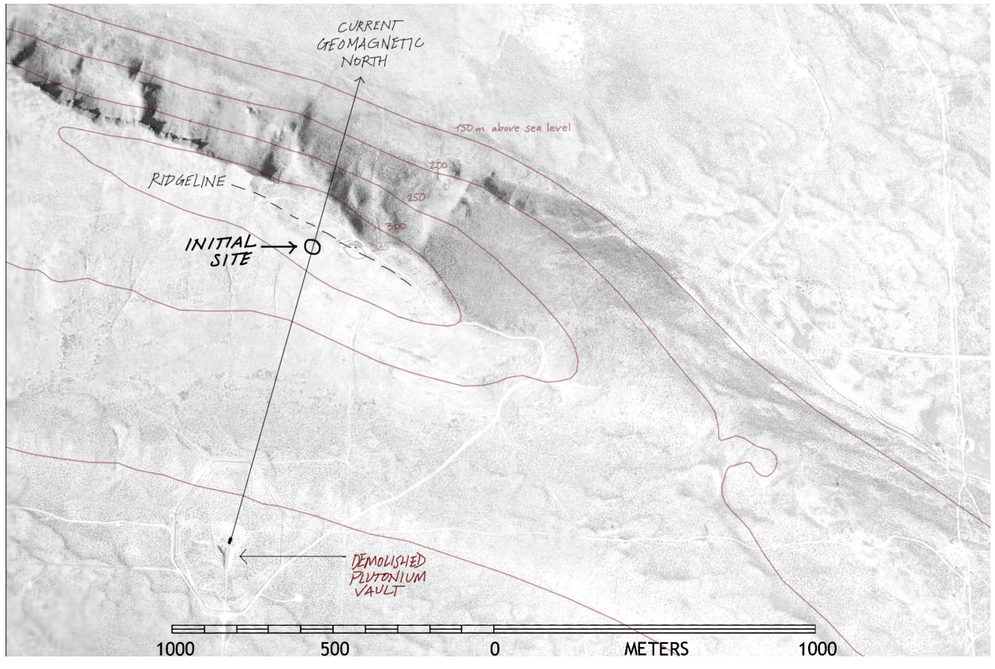
METERS
1000



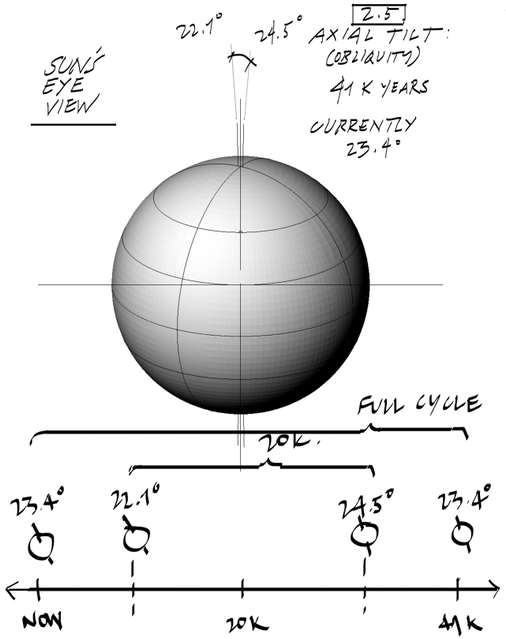


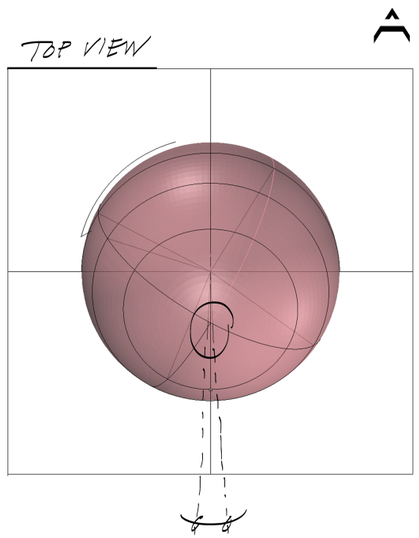
INITIAL SITING

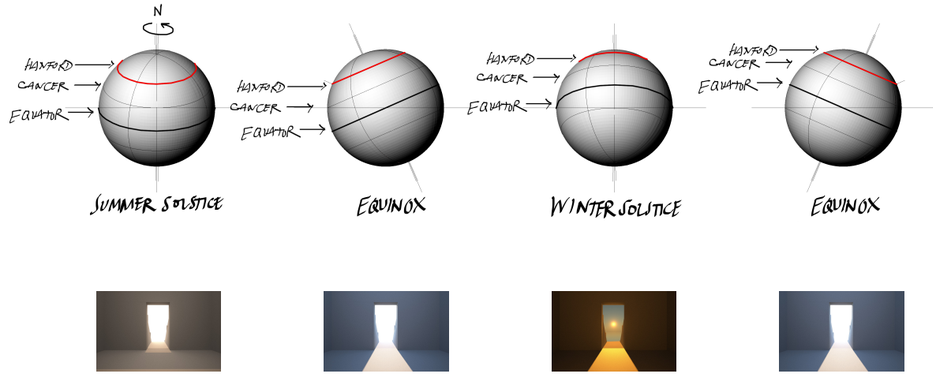
Due to the magnetic forces generated both within and around Earth, every location on the planet has a specific magnetic declination (the amount by which compasses must be adjusted when orienteering). Compasses naturally point to the pole of the geomagnetic field, which happens to be changing constantly. Because geomagnetic north moves, most recently at 55 kilometers per year, declination must be updated accordingly. At Hanford, where the declination is currently 15 degrees, this roughly translates to a 0.13-degree annual angular change (in plan). [42]

The combination of shifting geomagnetic north and a historic site in the former vault location, final home of plutonium at Hanford before its demolition in 2012, locates the first architectural act. [43] By tracing the 15-degree Eastern skew from geodetic north (according to the rotational axis of Earth), the priesthood follows geomagnetic north to the top of the ridge, turns 180 degrees, and begins excavation. In a 24,110-year symbolic return to the "final" polluted site, the monastery makes a journey lasting the half-life of plutonium, from future to past, aligned to the dynamism of geomagnetic north.

By responding to something that changes constantly, but also shifts and even inverts across geologic time, the multi-scale temporal goals of the priesthood are immediately reflected in a visible trajectory. However this beginning architectural act, as will become apparent, is but one gear in a colossal clockwork which, played out through time, reveals deeper patterns in longer cycles and connections between time, change, individuals, and the universe.



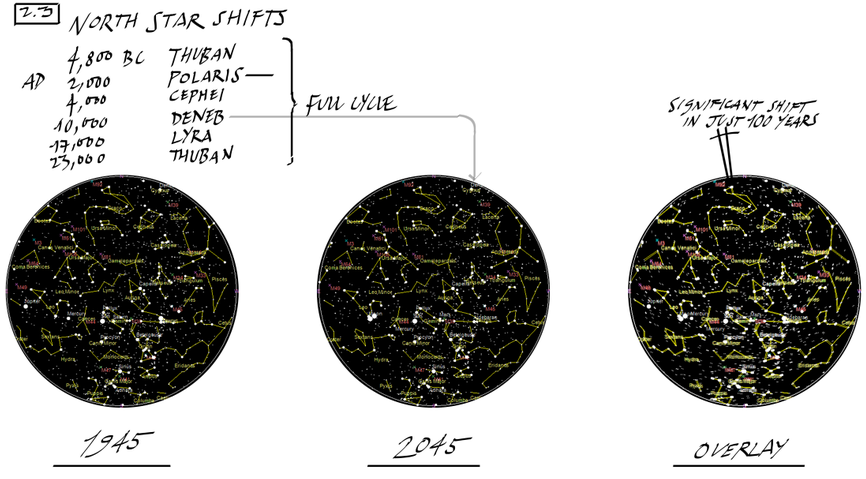


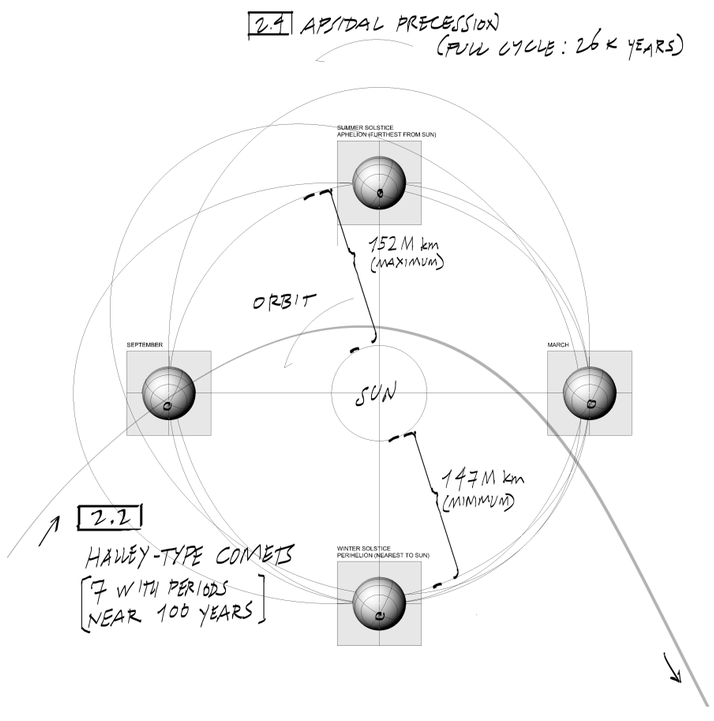


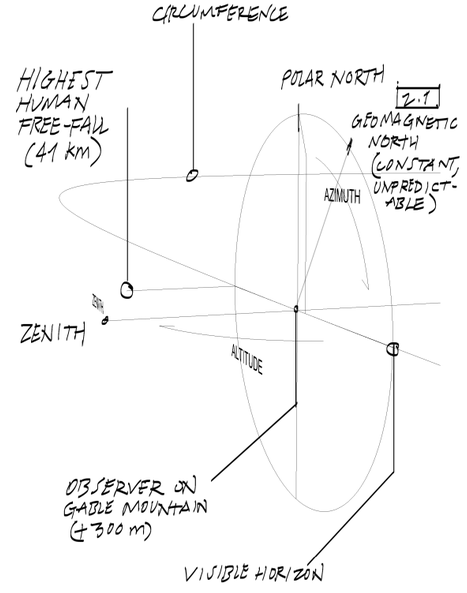
STRANGE CYCLES

A site is often summarized in terms of relatively recent observable weather patterns, including the usual average and extreme temperature ranges, sun paths, and wind vectors. However these climatic conditions, quite brief in geologic time, will most certainly vary over the life of the priesthood, if not because of global warming, then simply because of more general fluctuations in weather. An atomic priesthood is less concerned with local time, and this society takes aligning measurements from much longer-phased cycles.

Zooming out from Hanford Site to see this place as a location on a rotating, orbiting planet that regularly traces an arc across the view of the sun, one recognizes a few interesting properties. In addition to magnetic north shifting constantly, the tilt of the Earth is not constant. Instead, Earth's obliquity oscillates very slowly between 22.1 and 24.5 degrees over the course of 41,000 years (there are also shorter cycles of axial oscillation of minimal intensity due to a property of rotating bodies called "nutation," which is experienced by spinning toys like tops, one possible alternative to dice for number generation).



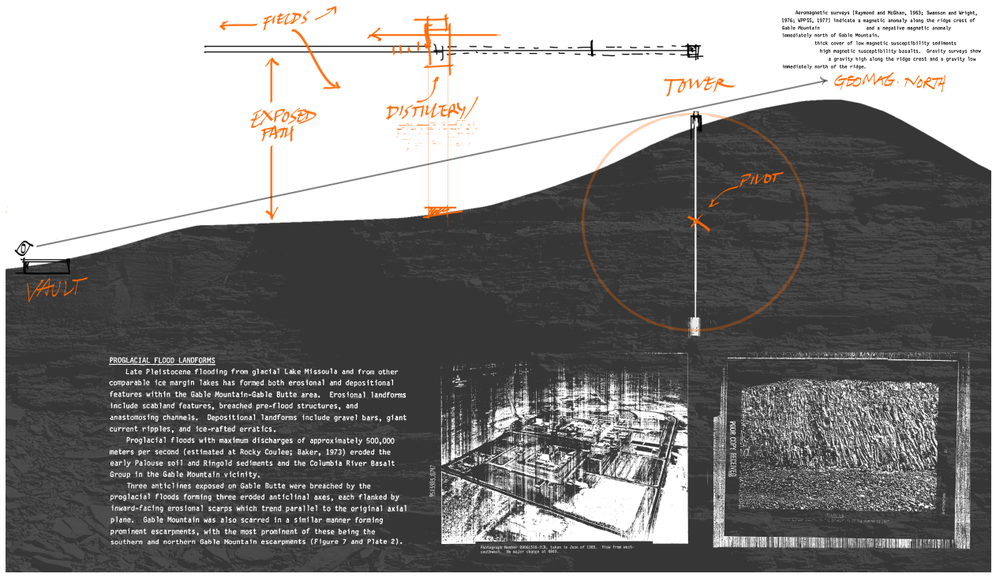


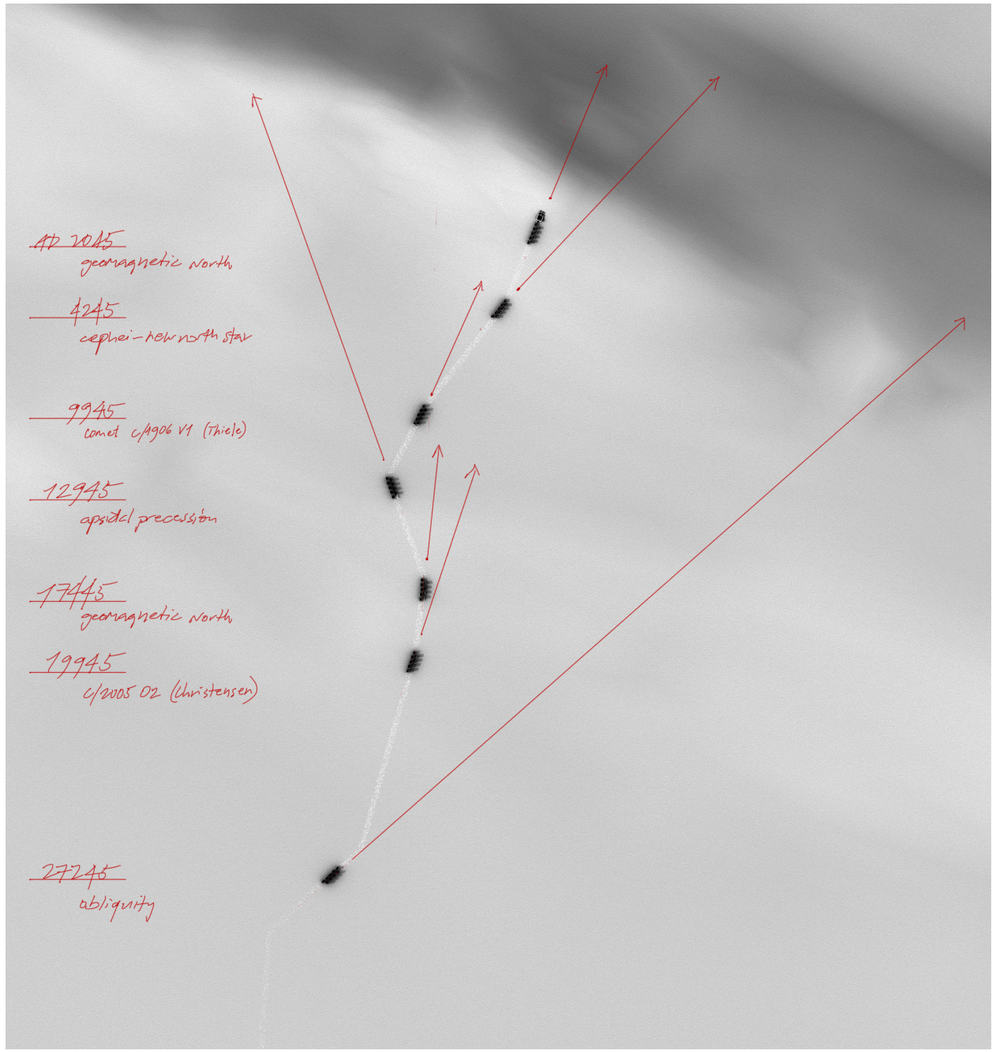


Further, two types of precession (rotation of Earth's axis or Earth's elliptical orbit) change the season during which Earth is closest to the sun. In 2016, the Earth is closest to the Sun when the Northern hemisphere experiences winter. This will reverse in 10,500 years, with Earth passing closest to the Sun during North American summer. [44]

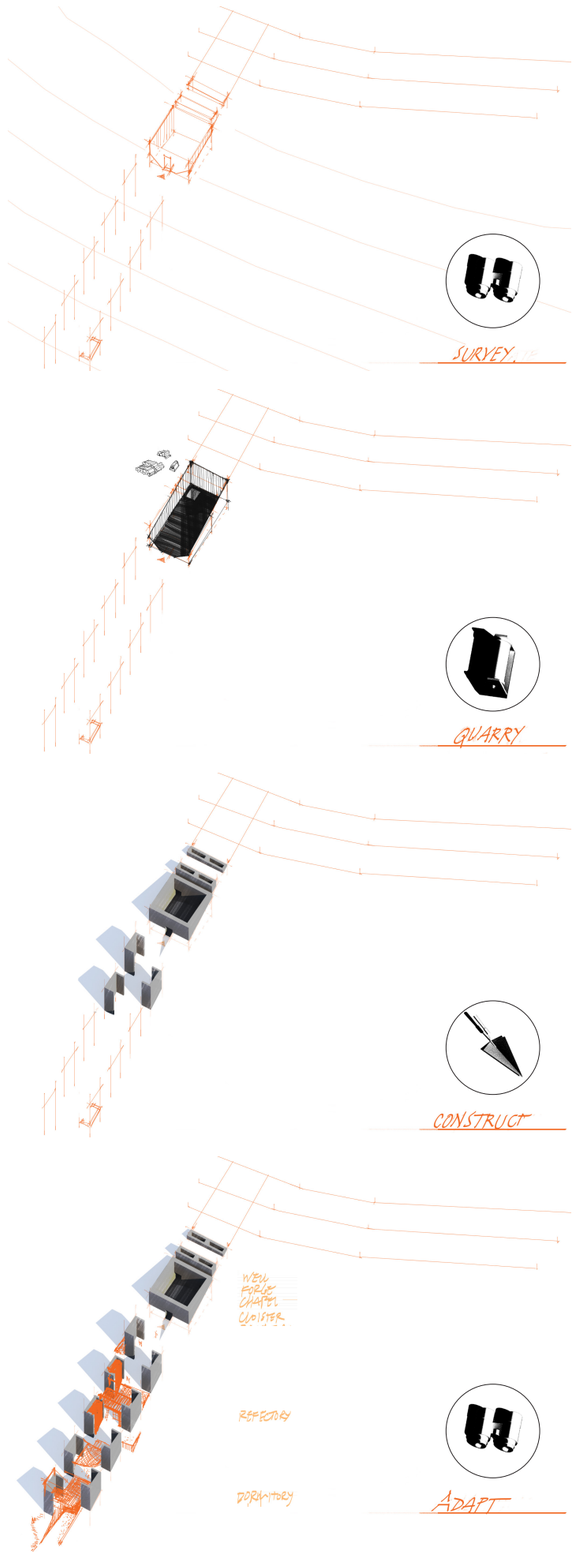
The North Star will not always be Polaris. 4,800 years ago, the North Star was Thuban, in constellation Draco (dragon), will shift to Cephei in 2,000 years, and will eventually return to Thuban in AD 23,000 (just a few thousand years before untouched Hanford plutonium will have decayed to half of its 1940's radioactivity). [45]

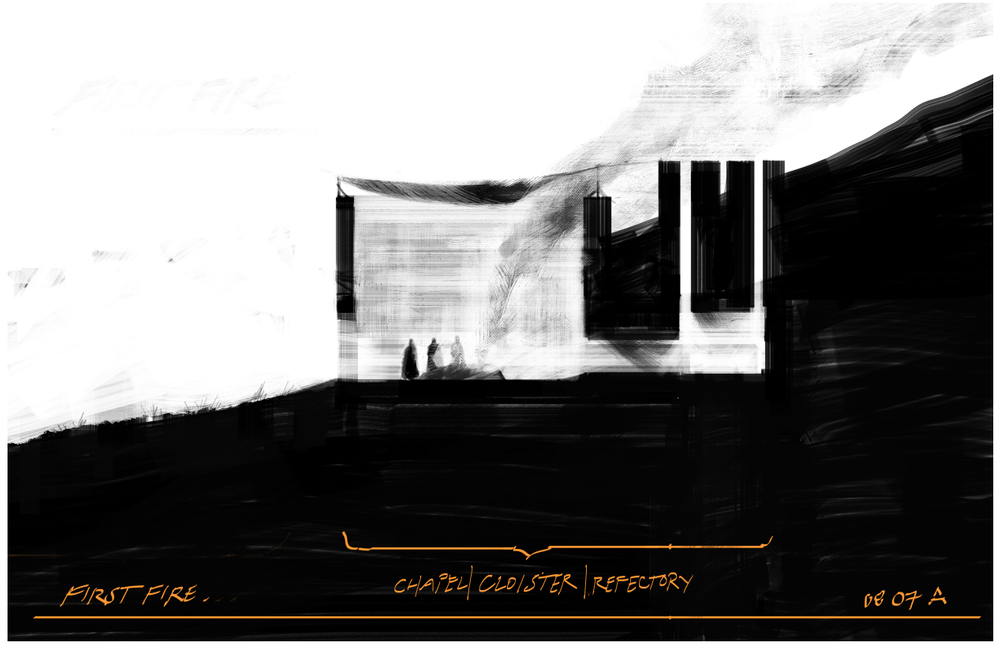
As early as 613 BCE, Halley's Comet is witnessed and recorded in China, and since then, a number of consistently-returning "Halley-type Comets" have been identified by astronomers and amateurs. [46] Seven Halley-type comets exist with periods between 90 and 110 years. [47]

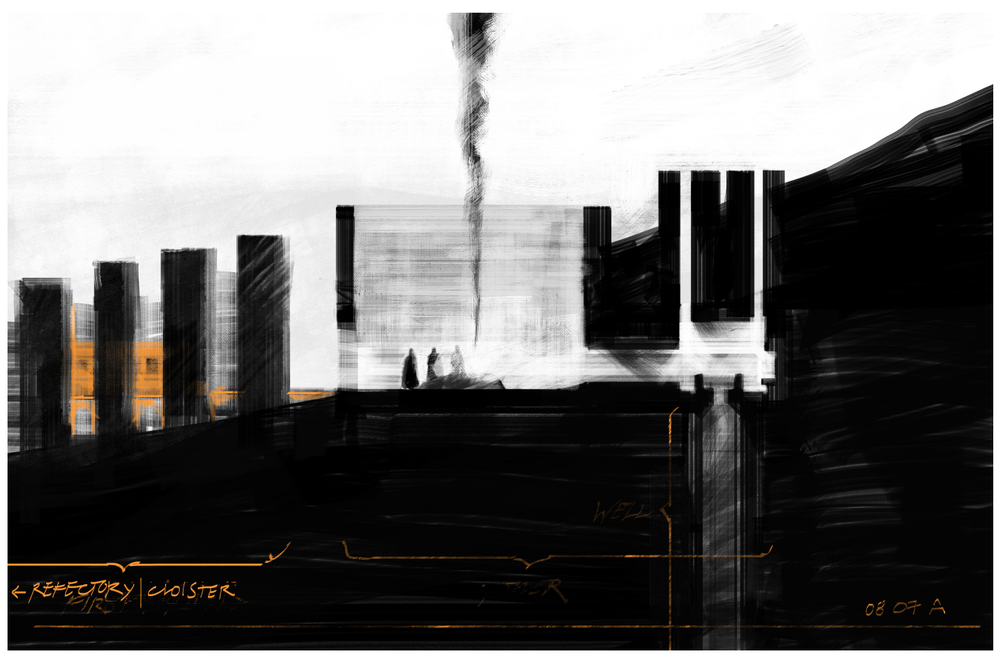




These various cycles offer many possibilities for ways of aligning a migration. The proposal simply highlights them, and allows the priesthood to determine which it uses. A speculative site plan shows just one of many (immeasurable, finite) possible paths down the ridge, aligning through several millennia to one cycle, several millennia to the next, and so on…


SURVEY.
QUARRY
CONSTRUCT
WELL
FORGE
CHAPEL
CLOISTER
REFECTORY
DORMITORY
ADAPT


FIRST FIRE.
CHAPEL | CLOISTER | REFECTORY
08 07 A


WELL
← REFECTORY | CLOISTER
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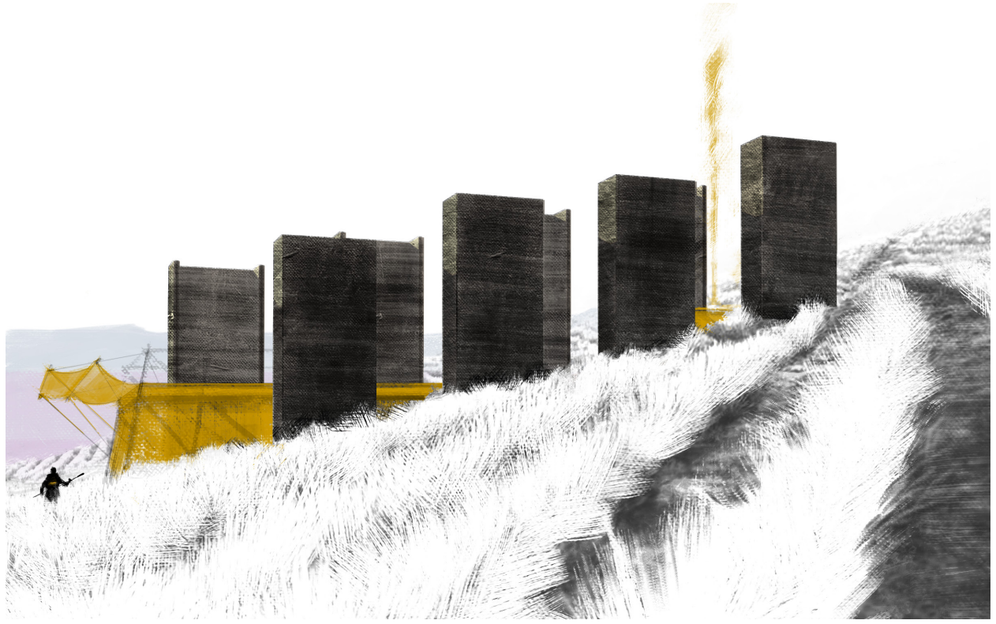
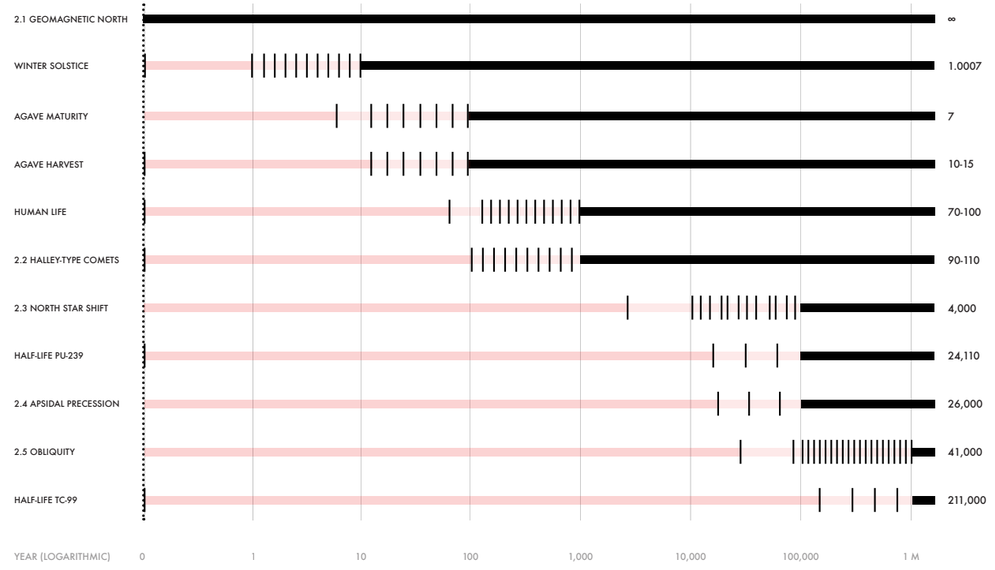
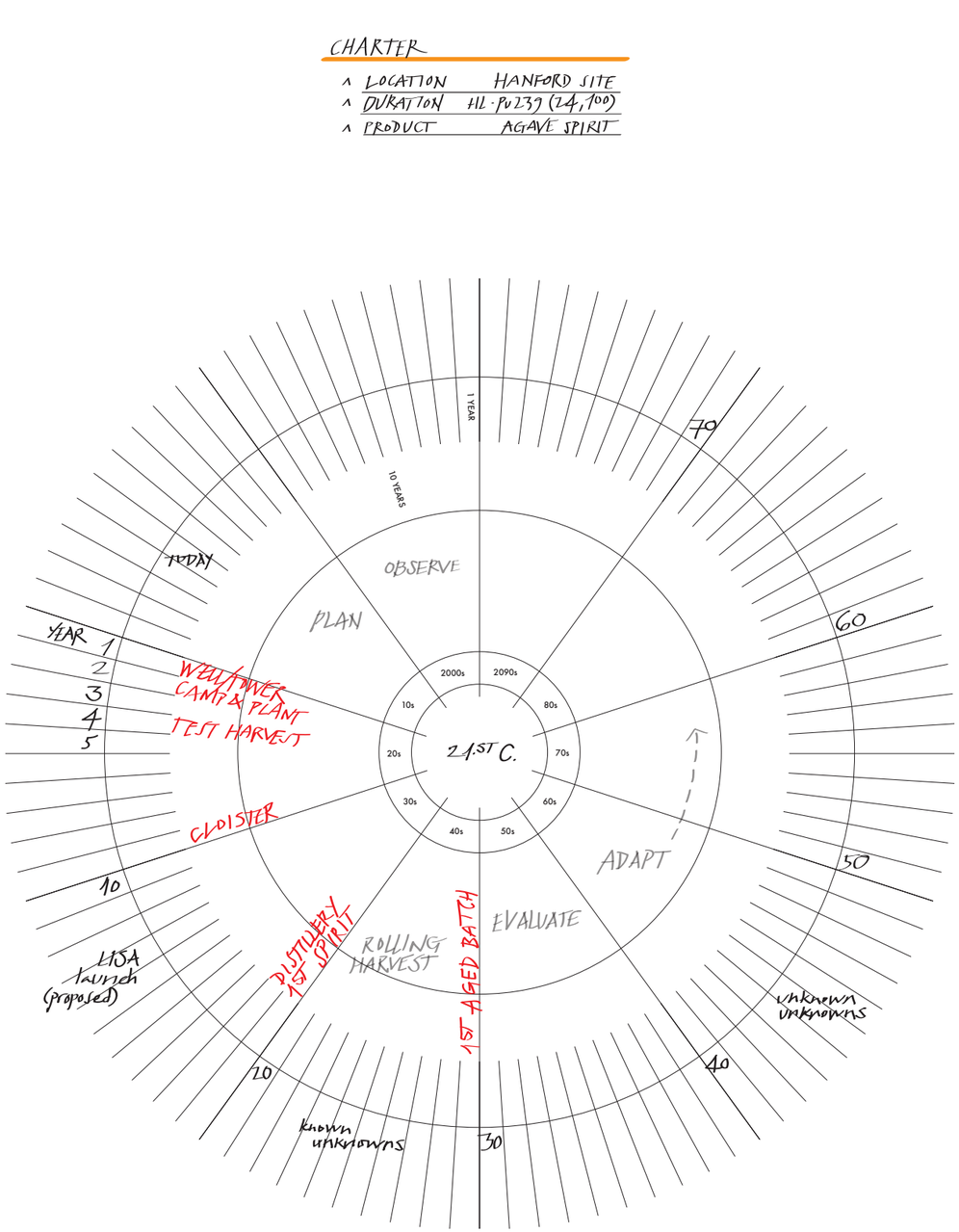


MIGRATION AND ADAPTATION

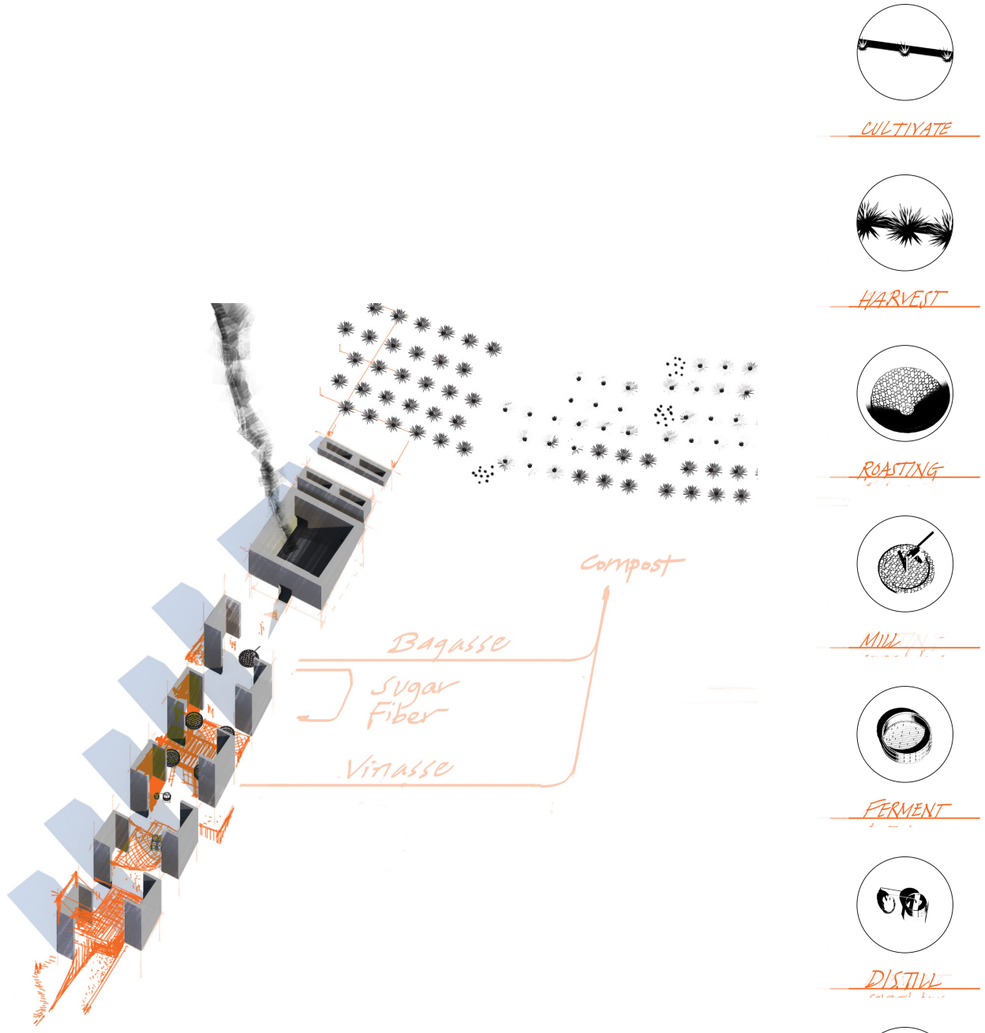
The aim of the migration is four-fold. Firstly, the project is an archive and perpetuation of knowledge. As existing technology improves, all manner of information related to radioactive elements is catalogued and stored in the DNA of the agave plant. [48] Accessible by computer, though biologically replicated and stored, the incremental archive exists in the seeds of each new generation of plants, living and multiplying across the landscape and legible to those with the sophistication to decipher it. At Sebeok's recommendation, the archive stores knowledge in many languages and symbols about the harmful effects of radiation on living things, but also contains records of the activities of the priesthood itself. [49] As a perpetual ship's log, the archive offers a fundamentally accessible, non-secret record that testifies to the guardians' ongoing efforts.

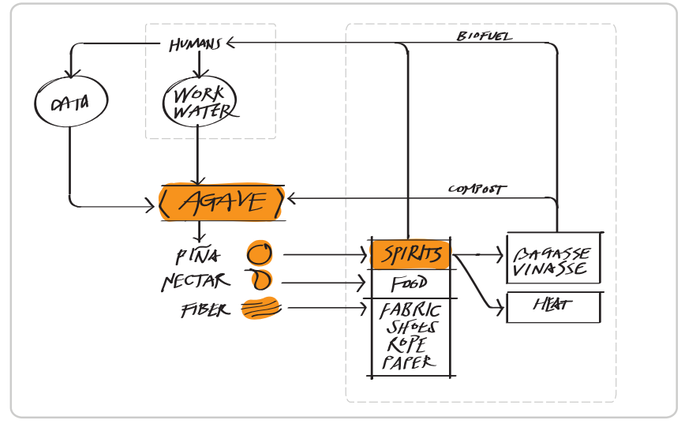


Secondly, the migration monitors and measures radioactive, geomagnetic, and astronomical cycles exceeding the duration of human life. One new *monad* is built every one hundred years to record the alignment of these various cycles for thousands of years at a time. In one possible site plan, alignments shift periodically, tracing a meandering and semi-random path down the hill. A specific schedule of alignments and shifts is not specified–the priesthood itself decides which phenomena to follow at which times in its history. As a way of engaging chance, the architect is involved in the creation of a multivariate algorithm, but not its specific execution. Some ideas are fixed and others are permanent, but the migration recognizes impermanence, noting the scale on which even thick stone construction shows weakness in time.



Third, the atomic priesthood cultivates agave to make a spirit in the traditional Mexican style called Mezcal. Every monastery produces something, as a part of a continuum of sacred functions. Trappist Ales and Chartreuse, for example, come from long-lived monastic communities that pass down recipes and techniques through many generations. These processes not only provide a small source of income, but also allow devotees an opportunity to work with their hands, exercise, and apply strength and ingenuity to an ancillary task. As historians Frances and Joseph Gies summarize, "From its earliest beginnings, Christian monasticism emphasized the importance of labor in the interests of the communal life and of humility." [50] The work is necessary in these settings as a part of fostering community and devotion, and it is at Hanford as well.

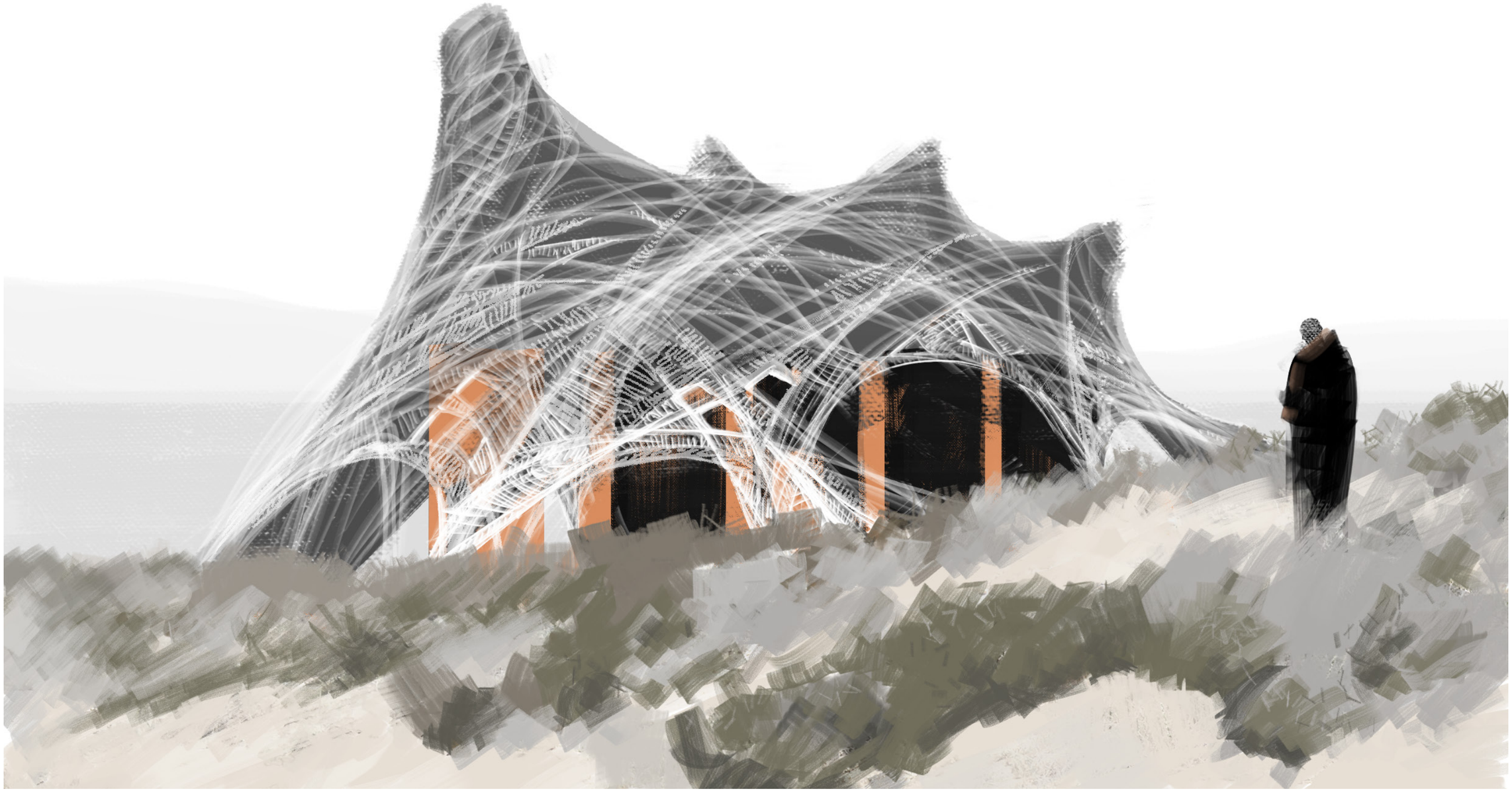




Because agave grows well on hillsides and can resist cold temperatures, the priesthood at Hanford might, in its telescopic endurance, be able to cultivate a native landrace of American agave and develop a distillery around its production. Though not certain to succeed, the work involved suggests an agri-technical settlement complete with the manual tools and facilities for agriculture, and the digital tools needed for communication, interaction, and information storage. This superimposition of cycles offers a rich interaction with weekly, daily, and momentary changes in the surrounding landscape and raw materials. Phasing involves a series of steps from the difficult harvesting of the agave heart or piña, to manual stone milling and natural fermentation, alembic distillation and aging. The process can take as many as 30 years from initial planting, but as early investments begin to pay off, harvests can be conducted almost constantly, resulting in overlapping production cycles and relatively constant work. [51] Further, bagasse (the fibrous byproduct of milling) and vinasse (the liquid byproduct of distillation) can be used in composting and biofuel processes. [52] Fiber, paper, fabric, rope, sugars, and candies can also be made from various parts of the harvested plant, creating a low-waste system with ecological sensitivity. [53] [54] Curiously, when the agave reaches maturity, it sends up a first and final effervescent stalk, several meters high, which blooms just before the death of the plant. It must then be removed and replanted; experts recommend harvesting sometime just before bloom.

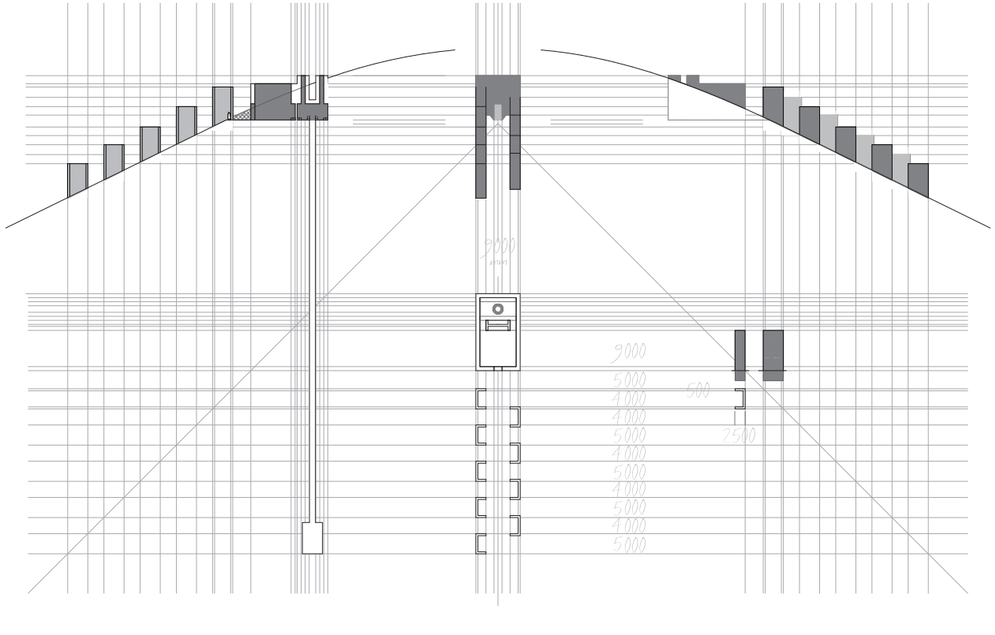
Lastly, the migration is a vessel for life. The architectural qualities of the migration are intentionally spare. As a bone structure with variable organs, the most permanent quality of this pilgrimage is its measuring of larger-than-human cycles. Everything else modulates with changing lifestyles, technologies, and preferences. One can imagine wood and fabric structures in the warm, dry summers;

subterranean, thermally isolated caves during ice ages;



grown biomorphic structures in times of innovation and plenty;

and scavenged adaptations to post-apocalyptic settings. Movement, albeit slow, becomes essential to the migration, as its only static function. Regardless of changing environmental and social conditions, the priesthood pursues a contemplative journey down the hill, progressing steadily, devoted simply to its own perpetuation. Of course, the guardians will need places to eat and sleep, to be together and alone. They will need places to make equipment repairs, construct and conduct experiments, and produce agave spirits. Perhaps the mill is donkey-powered and the guardians build a stable. The roasting pit can double as a heat exchanger. Geo-thermal and wind power can harness natural forces to power electronics. Any of these adaptations might be imagined within and around the migration, yet their possibility and richness don't demand further specification.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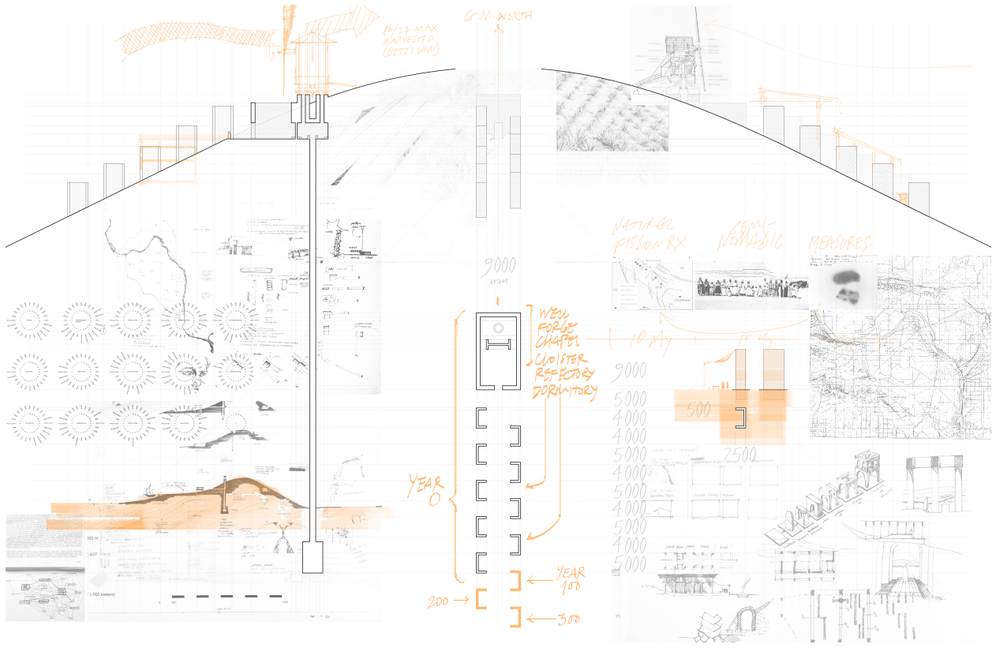
G.N. NORTH
9000
NEW FORCE CHAPEL
ULSTER REFUGEE DORMITORY
YEAR 0
200
YEAR 100
300
NAZI-RAE EVASION RX
REAL NEVADA
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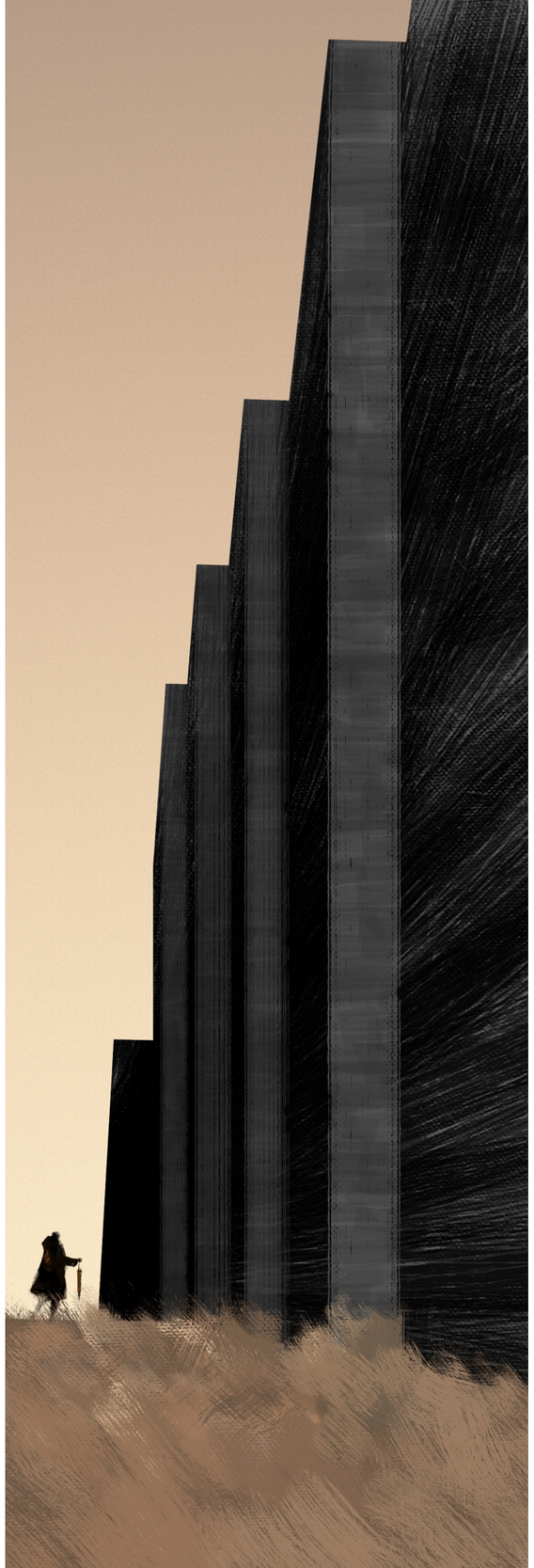
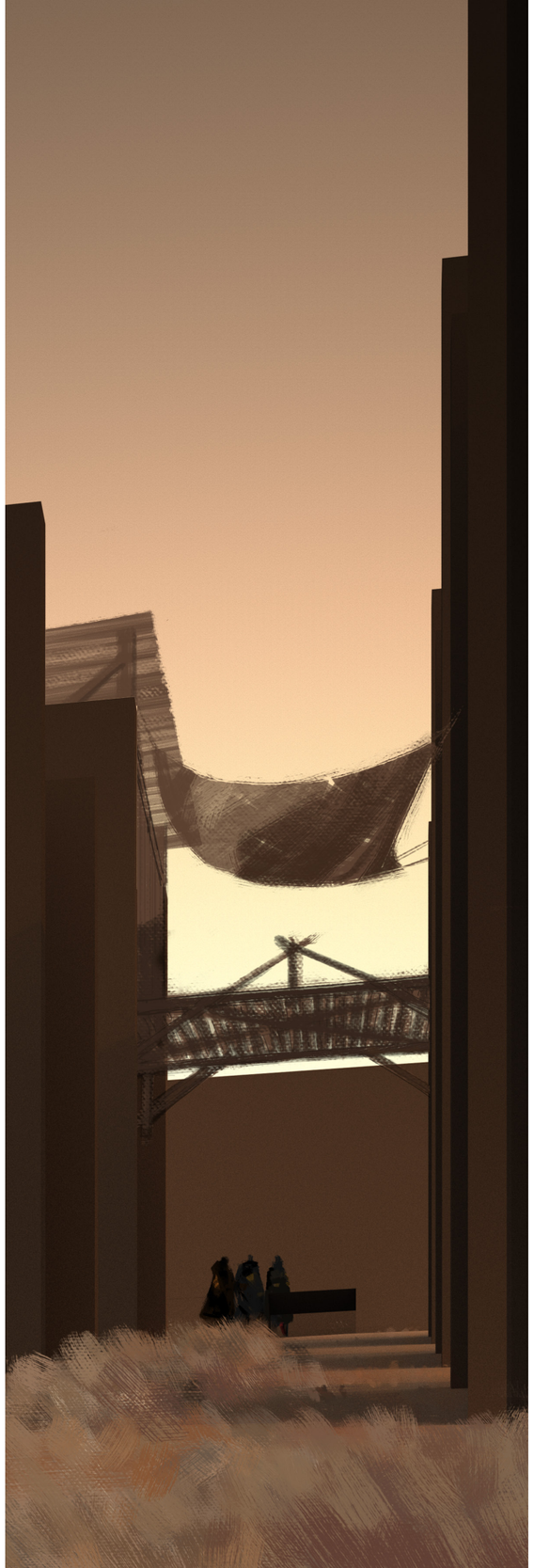


Though one can easily imagine more refined scenarios, to intend for something that lasts beyond a century is to make quite a bold statement about human needs and responsibilities. Accordingly, the establishment of an algorithm, built of basalt, fueled by a devotion to protecting future generations, must be simultaneously generic, specific, and symbolic. Perhaps the architectural form of the monad isn't essential or obvious, although as a channel, it offers lateral support and a space-enclosing quality. Many sorts of "units" are considered – columns that easily accept orthogonal load-bearing wooden beams, slotted castle walls, cross shapes to accommodate stacked, poured, or rammed-earth walls with insulating corners. These solutions, though architecturally rich with potential, might actually become limiting. By suggesting too much, the designer assumes a familiar role of control. By suggesting just enough, the designer opens doors for an imaginative evolution, constrained only by gravity, proportion, and orientation.



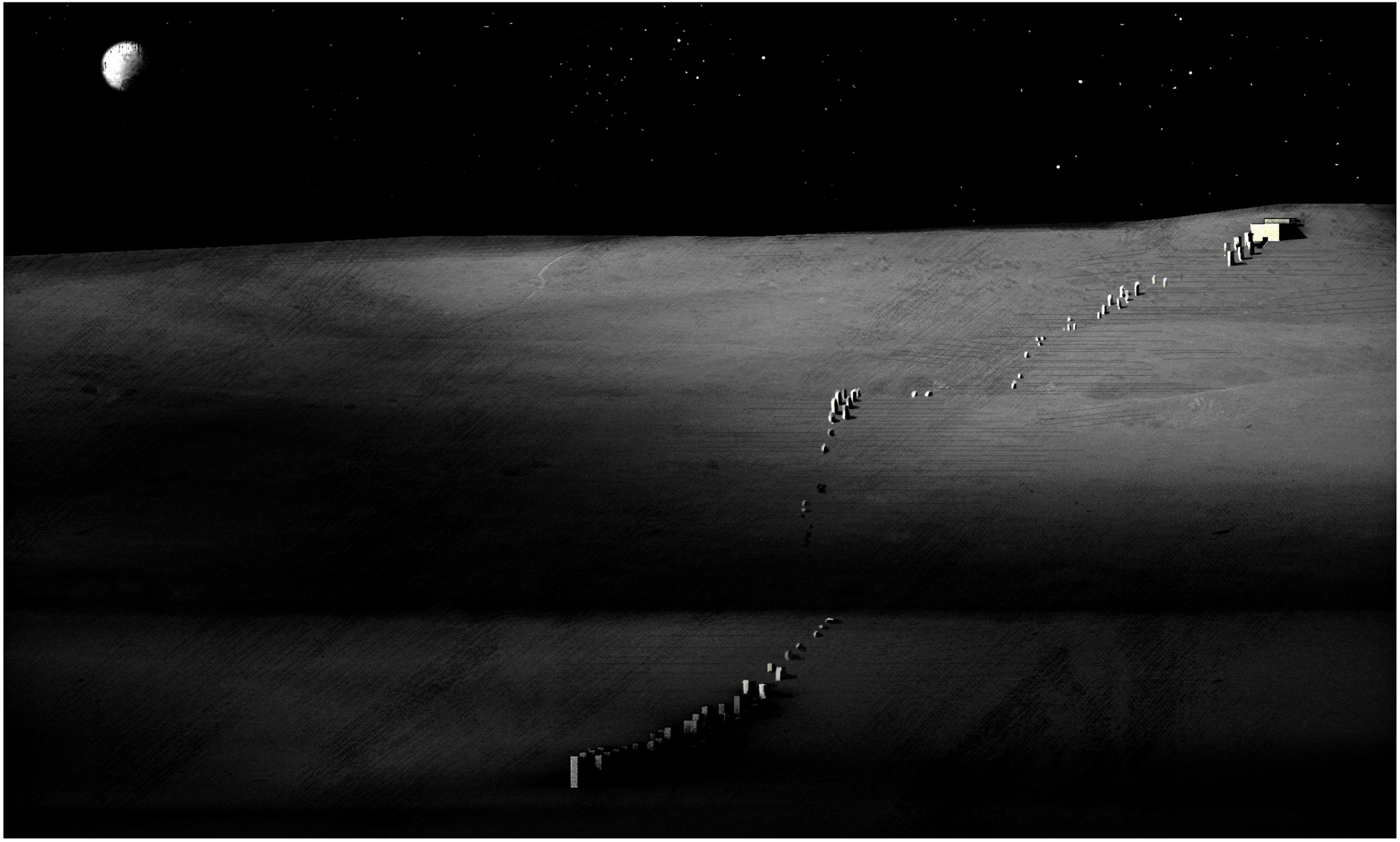
The migration dictates a long- and a short-axis, a height, and a staccato rhythm. An alternating orientation offers openness, whether roughly East or West, which affords responses to solar orientation including thermal mass, shading, and wind control. These can be studied and tested at 1:1, in real time. Perhaps architects visit to work, in a mode similar to Arcosanti, with ongoing projects, constantly upgrading and revising living conditions. In all cases, the basalt weathers quickly from smoky black to rust. The immediate ruin shows its age incrementally, and infills last as long as they are useful. Time and its inevitable passage are visibly affirmed in an architectural layering of durability, simultaneously welcoming and resisting its own withering.

DURATION

As the typical individual life lasts less than a century, it is possible that even the most committed member of the priesthood might miss the construction cycle of the next monad. Fitting just barely within that time frame, a person might exist solely among a fixed set of modules. Energy and resources in an "off-season" might be directed towards better adaptations within the migration, but nevertheless, individual stays with the priesthood can be varied in their interaction with measurement schedules. Perhaps tours are available, but one can also imagine, for example, groups of PhD students coming from university programs to conduct yearlong internships with the priesthood. High-school students might spend summers learning to till and sow the land, study plants, and help with experiments. Disciplines from botany and astronomy to particle physics have a place here in an odd but fruitful blend of mutually beneficial esoteric and manual skills.

Through time, many possible narratives can exist within the migration. The design intention isn't to constrain or enable them specifically, but to imagine the efficacy of the monads in this context. There are, of course, current and future architectures that simply won't fit within the migration – perhaps they must exist alongside it. However, the proposal posits a future in which the architectural necessity of alignment and measurement takes precedence over all other considerations. One value of a fixed rule is in the creativity with which a priesthood might flex to accommodate it, and how that accommodation might reflect the personality of particular moments in the narrative. In other words, architectural form empowers personal architectural interpretation. We make spaces our own.

The monad connects individuals to populations, stones to planets, and moments to millennia. Without this architectural interpreter, the priesthood focuses too narrowly on the present. Without agave, they dwell fully in unknowable futures. Vital, soulful elements of archival, cultivation, and migration allow for a quality of life that is not only fully present to the difficult task of perpetual motion, but also engaged in local cycles of growth, death, and regeneration. As relative permanence within a thriving dynamism, or the breath before the next measure, or the seed of a future harvest, architecture simply offers a bridge between worlds. What more can we ask?

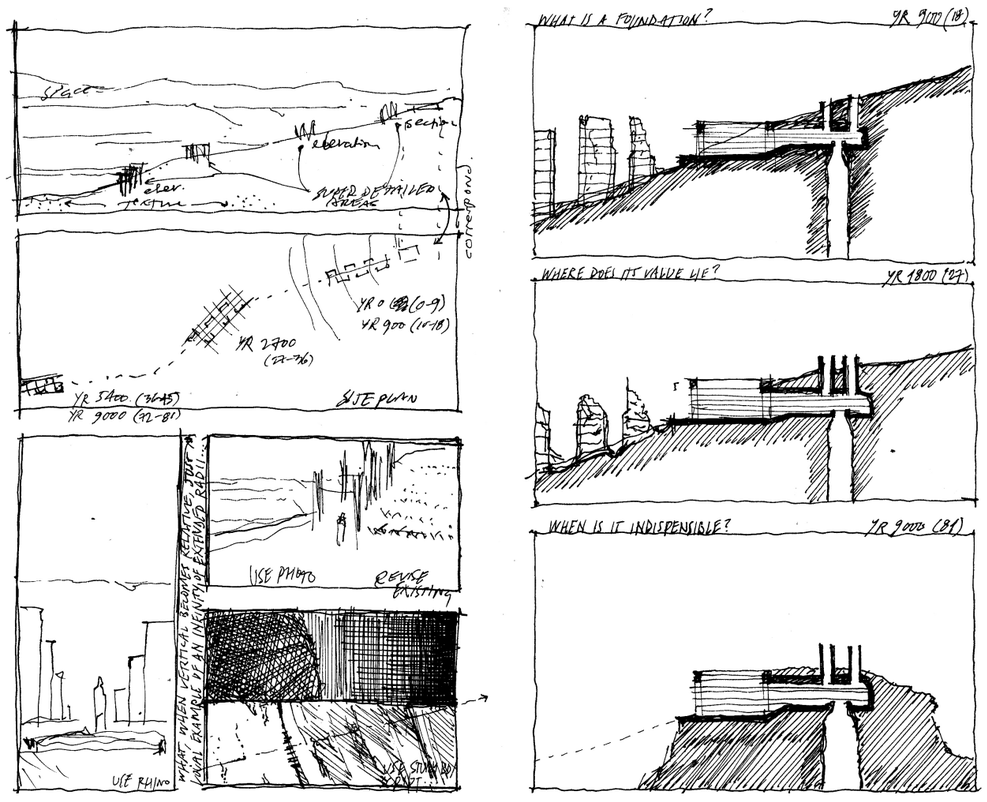


Design as a determination in advance of what is to happen, and how,

is brought together with design as a calculated risk,

an acceptance of accidents within a set of declared limits.

Lebbeus Woods [55]



DISCUSSION

The discussion following the presentation of this thesis follows several interesting lines of questioning, opening new ways of thinking and posing possible conflicts between stated intentions and results.

TIME / INFORMATION / DNA

Knowing what little we know about time…that it has direction, and that we can measure it by the changes we observe in our surroundings, how does an atomic priesthood interact viscerally with time on many scales, particularly on minute scales – in the moment? In what ways does architecture interact with and enable the instantaneous friction and activity of everyday life? How can the looming primitive ruin also interact with the senses on an intimate level? These opening questions summarize many of the author's own struggles, and thankfully the discussion of time runs throughout the conversation, growing stronger and weaker like radio static. Several intriguing comments address the measurement of time with the phased unknowable site plan, with the monads, or with each ad-hoc fill among the migration. A primary challenge – how can small architectural details communicate the ideas that are already reading in the project at large scales?

Questions about information sharing, openness, and transparency arise, and the idea encoding DNA with information, never drawn but always intended, makes it into the programmatic description above because of these thoughts. Another comment encourages the jettison of the primitive monument altogether, instead seeing the architecture of information, stored in DNA, as the entire project…and moving forward from there. This is a thrilling prospect.

RELIGION / MONASTERY / PRIESTHOOD

The intention it *not* to limit participation by gender, but because the historic term "priesthood" implies *male* priests, it is possible to question the name "Atomic Priesthood." With a more neutral name, perhaps Atomic Guardianship, or Nuclear Order, etc., gender questions could be avoided, leaving the story to play out in a viewer's mind in the most natural way. Of course, it costs little to remove this barrier to believability, to explicitly expand the narrative. The project is never imagined exclusively with men, although comparisons to single-gender monastic traditions (both men and women) are certainly part of the study. In another sense, however, in the same way that artificial rituals and legends are avoided; the creation of a new name seemed superfluous. The "Atomic Priesthood," though a minor character in the story of the atomic age, plays a major role in this project. To abandon the only fixed terminology that endures today seems equally at odds with preserving believability. The choice to retain the name hopes to tie the project to reality.

An aside, or elaboration of these questions involves the questionable relevance or utility of the term "monastery" for this project. Perhaps the monastery could be called "facility," and the priesthood "guardianship?" There are strong ties to monastic life in the origins of the project (including the amazing documentary "Into Great Silence" as primary source material [56]), and yet its implications might be distracting for some. Similar to a monastery, this thesis proposes an order of devotees, living and working in a relatively isolated place, with a specific mission and set of beliefs. In contrast, the atomic priesthood has no supernatural element, no transfiguration, no communion with other levels of reality (unless one considers the far future, in its presence and relevance today, as a sort of supernatural world, see Morton on Hyperobjects), and no sacrament. But in the gray area - perhaps individuals meditate. Perhaps the place serves as a gateway to deeper understanding of physics, biology, etc. Further, isn't it possible that sub-atomic particles, quantum physics, and the universe function in much the same way for scientists that a higher power functions for those of faith. Observational limits to tools, but also to the subjects themselves, place significant distance between the scientist and the thing itself. The films Primer (2004) and Coherence (2013) offer spiritual tastes of how these strange properties of unknowability might manifest in the human realm. That the Christian monastery, as a typology with social and spatial implications (namely, the cloister and dormitory, bell tower, refectory, chapel, balneary, calefactory, and grounds) grows from and facilitates a very specific system of beliefs, need not mean that its value lay exclusively in a link to those founding beliefs. In other words, we can imagine the monastic tradition bending to fit the needs of an atomic society.

In fact, the discipline of architecture participates in this inflection constantly. The Baths of Caracalla flex to accommodate the 1960 Olympic games; Hedmarksmuseet (the Hedmarks Museum) in Hamar, Norway by Sverre Fehn stands upon and around the ruins it displays; and the Pantheon, with its one window and one door, gathers all manner of people, even today, for ongoing ritual activities, community, and tourism. The value of these structures is certainly high, and of course their architectural qualities (certain proportions of space, light, material) outlast function (images of the gymnastics event in the Baths border on the sublime).

Earlier in the quarter, there is a discussion about material, questioning the archaic use of load-bearing stone construction for the monads. Using a material of the site fits within the framework of making cycles visible and apparent. With a chance to grow something from the very ground it stands on, the basalt extension of a purely basalt ridge seems auspicious and well suited to task. Further…basalt itself is a measurement – when basalt floes cool, they record the geomagnetic signature of the Earth at that moment. This is one of the ways we know that the Earth's geomagnetic field has inverted several times in the geologic past – the spreading mid-oceanic ridge is a constant recorder of these signatures (thank you, undergraduate Oceanography). But these two aspects of the project, monasticism and load-bearing construction, are sincere attempts to something ancient as a way of bending and dilating time. Load-bearing construction and non-reinforced concrete (like human history with respect to the Internet) have much more significant heritages in building technology than steel. Though limited by strength or labor, stone construction is sustainably archaic. In a sense, were all "modern" technology to fail; the priesthood can still quarry basalt, use the mechanical advantage of pulleys to stack it, and

continue the tradition of measurement in the landscape…they can still live and labor together through time, absent any of the other programs we assume, as a way of perpetuating knowledge of relevant subjects.

Conversely, but without contradiction, this project could be conceived and played out abstractly, as in a dream. As several jurors suggest, the science-fiction quality of the rendering style successfully preserves a sense of wonder and looseness, and an intended distance from traditional architectural representation. Mentions of the novels Dune and Anathem, specifically, resonate not only in visual and spatial ways, but in similar subject matter as well. The female religious order in the former, and the religion of science in the latter give some credence to part of the argument of the thesis – that a group of people might commit themselves to such a task as guarding and curating nuclear waste (after all, we read science fiction for its very real connections to human life). Further, this brings up questions about the role of religion in the project. Perhaps the priesthood is incomplete without an explicit accompanying religion, or maybe the cultivation of agave stands-in for a sacred function. In a way, the foundations of religion are already there. Though not completely isomorphic, the sacredness of the first fire, the ritualistic building events followed by long eras of cultivation and adaptation, and the birth and death cycles of agave itself all resound with religious constructs. A belief system is in place: that harmful radioactivity is our responsibility, and we must guard future generations from its negative effects. Perhaps the leadership structure is a significant outstanding question. However, it may be sufficient to say that this need not be a sticking point – architecture can be potent in both sacred and secular contexts. Perhaps the nobility of an atomic priesthood transcends a sacred context that may or may not be read into it. These remain open questions.

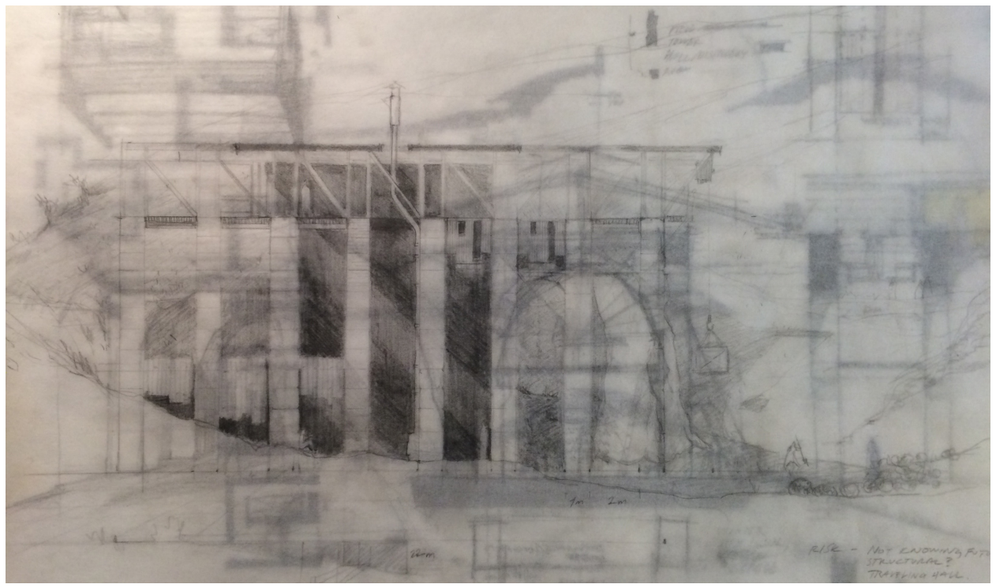
The societal need for sacrifice, often through violence or war, comes up as well, reminiscent of Bataille's Accursed Share. In a way, there is no built-in release of energy, anger, and excess. If this is necessary for longevity, perhaps the priesthood builds it in, and this is an area one could easily explore in graphic novel, or further narrative illustrations. Agave plays a central role in near-human scales of time and space. And though not depicted, the mess and grit of growing agave and morphing it into a spirit also points to a spiritual process. From the several-day roast of the "heart" to stone milling and natural fermentation, and the resulting *aguardiente* (fire water), this process is both elemental and transformative. The value of such alchemy can't be ignored.

SPACE / KNOWLEDGE / THE UNKNOWN

Some of the final observations deal with the essence of the thesis – its ability to meaningfully approach the scope it suggests. The unknowable always accompanies knowledge, like the reverse of a coin (Morton), and measurement, at its essence, is the acceptance of incompleteness. Human instincts about measurement arise from parts of the body, so that the world is always conceived in terms of a subject. Though perhaps futile, we attempt to relate everything to everything else, zooming in and out, as in Kees Boeke's book: Cosmic View (1957), and its derivative by Charles and Ray Eames: Powers of Ten (1977). If the thesis successfully evokes a sense of human longing for understanding and resistance to the unknown, then the slow migration of basalt across the landscape, as an algorithm, signifies the progress of knowledge and its logical advance. But all things resist our complete understanding (whether at sub-atomic scales, or their origins and relationships to universal laws), and the adaptations of the migration signify that difficulty. We struggle against immeasurability, and always come up short. The migration embodies this tension, and by moving forward anyway, acknowledges that it must always be so.

William Blake asked the tiger, "In what distant deeps burned the fire of thine eyes?" What struck him in this way was the cruel pressure, at the limits of possibility, the tiger's immense power of consumption of life. In the general effervescence of life, the tiger is a point of extreme incandescence. And this incandescence did in fact burn first in the remote depths of the sky, in the sun's consumption.

Georges Bataille [57]



REFLECTION

Born of strangeness and oddity in architecture; of risk as a necessary fuel; of control as continuum and illusion; and of chance, plumbing the deep inherent order of the universe; this thesis charts a meandering course across various interests, disciplines, and methods. The progression affirms the sentence: *Great Fiery Weapon, Chemistry, Hyperloop, Yucca Mountain* as a point of departure, a constraint, a lens, and a motor. The work interrogates oblique methods of representation, offering expanded conceptions of scale, time, and place. The architect proposes an improvised, ecological, monastic lifestyle within a directional migration of modular measuring devices, linking the individual to the largest and smallest possible durations and spaces. The growing ambition of this thesis features architecture as a protagonist in narratives of beauty and death, the history of knowledge, and the specific power of a single mind within the immeasurable void.

How can both Rubik's Cube and nuclear Armageddon

be discussed at equal length in one book by one author?

Partly the answer is that life itself is a mixture things of many sorts,

little and big, light and serious, frivolous and formidable…

Douglas Hofstadter [58]

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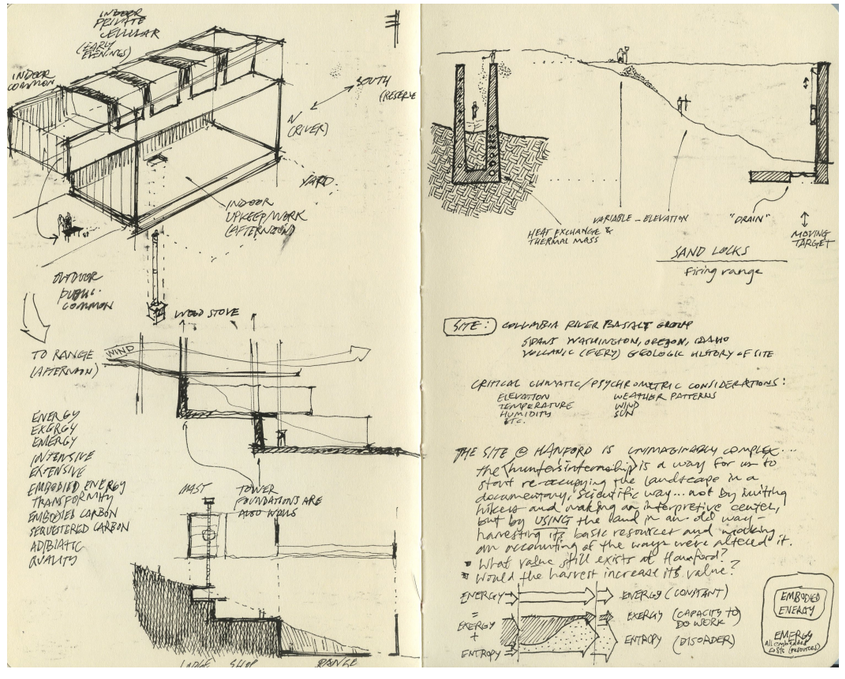
LIST OF FIGURES

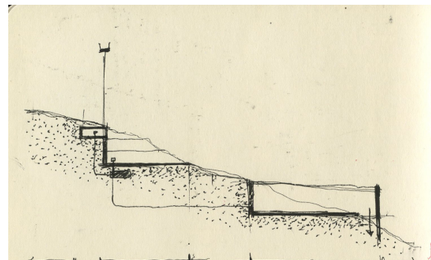
All images created by author, unless noted below

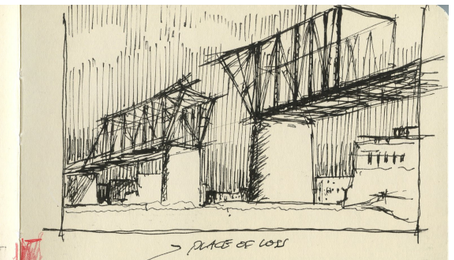
APPENDIX A – BOW-HUNTING

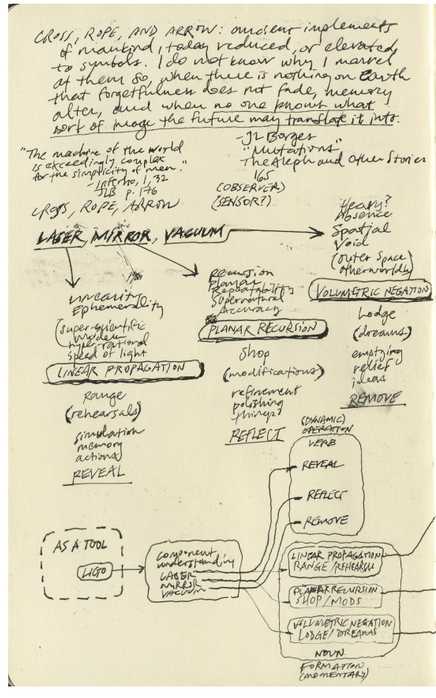
Before the conclusion of the thesis research quarter, an experimental charrette tests a simple question: what would it mean to propose a bow-hunting lodge at Hanford Site?

LASER-INTERFEROMETER SENSITIVITY
10^{-18} meters ($1/1000$ proton)
GRAV-WAVE-OBSERVATORY
LISTENER-DETECTOR (DISTRIBUTED)
MUNICIPAL PLANETARY
HIGH ENERGY DEVICE
LOW ENERGY SYSTEM
EXTREME TUNING
"ISOLATED" CLOSED SYSTEM
"DAMPENED"
COSMIC EVENT
620 MY
UNIVERSAL
ARROW
BUILT BOOM-TOWN CONTRACTORS
HUNTER
HUMAN
BOW-HUNTING
km² RESERVE
TERRITORY
LOW ENERGY DEVICE
HIGH ENERGY SYSTEM
MANUAL TUNING
"INTENSIVE BOUNDED SYSTEM
FISSION REACTION
10^{-12} meters (atom)
NUCLEAR REACTOR
LISTER
MAKER
MONUMENTAL
HIGH ENERGY DEVICE
HIGH ENERGY SYSTEM
MACHINE TUNING
"LEAKY" OPEN SYSTEM
7 km ø
km² RESERVE
WASTE DISPOSAL
URANIUM MINING
LOCAL SCALE
SYSTEM SCALE
LOCAL ENERGY
ENERGY INVOLVED (TOTAL)
DISTANCE TO TARGET - SIZE OF TARGET
PRECISION OF INSTRUMENTS
DANGER

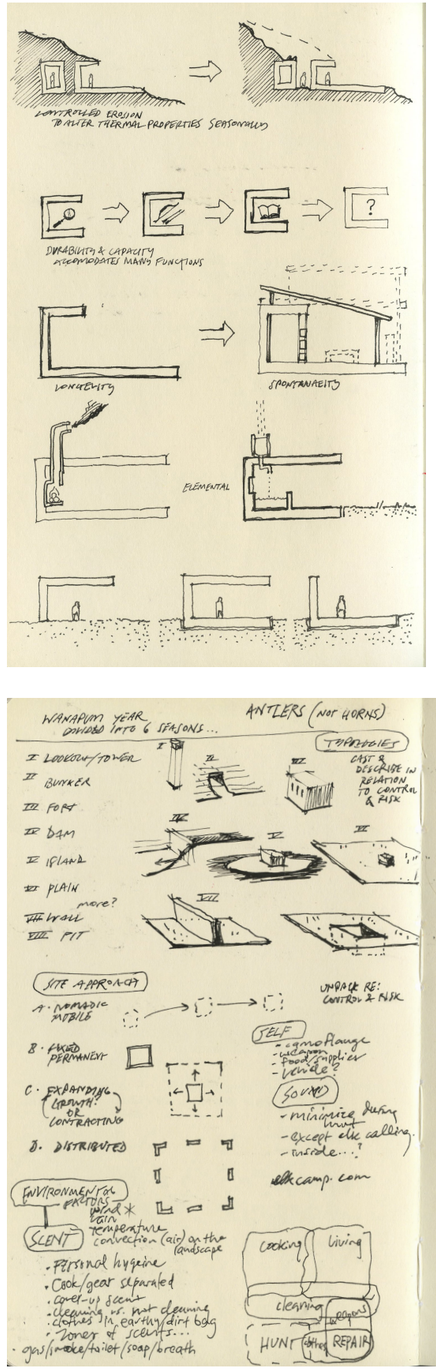


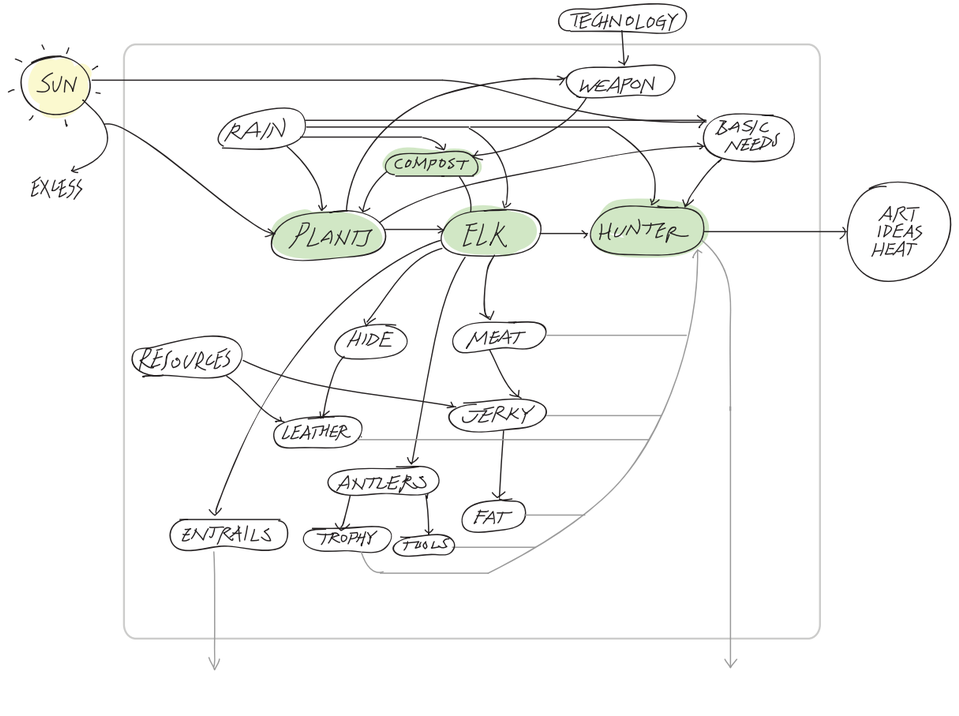


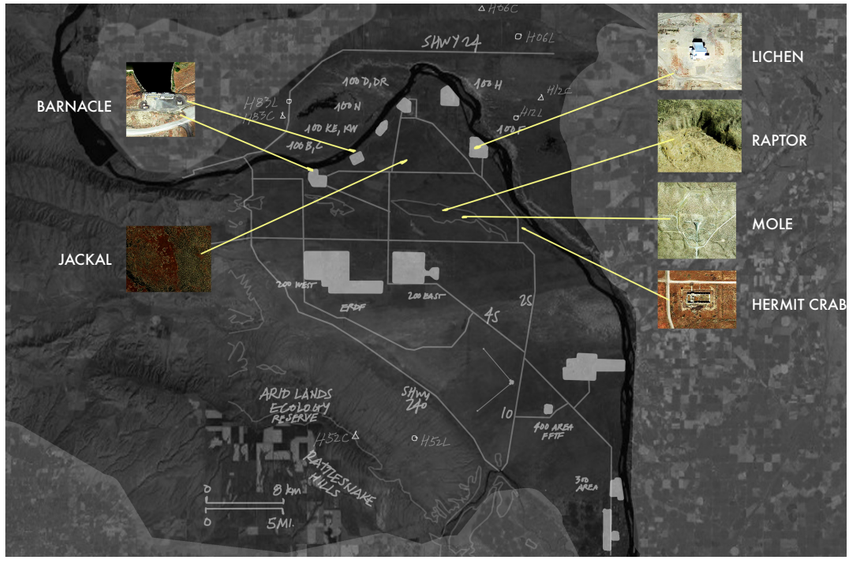




LODGE	Rms	Qty	Total sq ft	Modules	Visual
SLEEPING	6	4	24	2	
BATHROOM	12	1	12	1	
COMMON	24	1	24	2	
KITCHEN	24	1	24	2	
SHOP					
REPAIR	48	1	48	4	
STORAGE	24	1	24	2	
RANGE					
RANGE	96	1	96	8	
FITNESS	12	1	12	2	
(GODCOLA)?	6	1	6	1	
TOTAL			444	24	
			miles²		
RESERVE	24M	1	[illegible]	[illegible]	120 (ABOUT THE NOTEBOOK PAGES COVERED IN MODULE SQUARES)
	24km²		240 M		

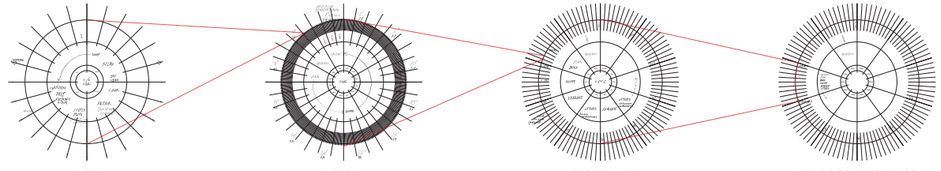

CONTROLLED EROSION TO ALTER THERMAL PROPERTIES SEASONALLY
DURABILITY & CAPACITY ACCOMMODATES MANY FUNCTIONS
?
LONGEVITY
SPONTANEITY
ELEMENTAL
WANAPUM YEAR DIVIDED INTO 6 SEASONS...
ANTLERS (NOT HORNS)
I LOOKOUT/TOWER
II BUNKER
III FORT
IV DAM
V ISLAND
VI PLAIN
VII TRAIL
VIII PIT
more?
TYPOLOGIES
CAST & DISCARDS IN RELATION TO CONTROL & RISK
SITE APPROACH
1. NOMADIC MOBILE
UNPACK RE: CONTROL & RISK
2. FIXED PERMANENT
3. EXPANDING (GROWTH) OR CONTRACTING
4. DISTRIBUTED
SELF
- agriculture
- vacuum
- food supplier
- cradle?
SOUND
- minimize during hunt
- except elk calling
- inside...?
elkcamp.com
ENVIRONMENTAL FACTORS
wind
rain
temperature
convection (air) on the landscape
SCENT
- Personal hygiene
- Cook/gear separated
- Cover-up scents
- cleaning w/ or not cleaning clothes in earth/dirt bag
- Zones of scents...
- ops/smoke/toilet/soap/breath
Cooking
Living
cleaning
papers
HUNT
REPAIR
TEMPORAL PROGRAM
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
SMOKE
PACK
STORE PACK
100
100
100
1 day
· CLIMATE
· HUNT/RETURN/PROCESSING/PREP
· FOOD-MAKING
· SKULL
MIN/AVG/MAX TEMP.
1 year
WHEN ZOOM OUT
100 years
what happens @ this scale?
· population changes
· waste cleaning/technology
· erosion
10,000 years
THIS thesis experiments w/ the perception of control/risk, which reflect & (re)ce) civic growth.
If control/risk can be questioned in terms of these additives, perhaps they can be questioned in the thesis project itself -


TECHNOLOGY
WEAPON
SUN
EXCESS
RAIN
COMPOST
BASIC NEEDS
PLANTS
ELK
HUNTER
ART
IDEAS
HEAT
HIDE
MEAT
RESOURCES
JERKY
LEATHER
ANTLERS
FAT
ENTRAILS
TROPHY
TOOLS

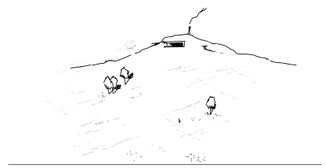


EVOLVED STRATEGIES

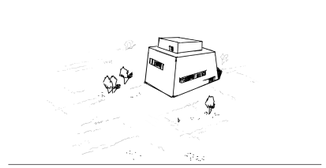
HUNTING RESERVE



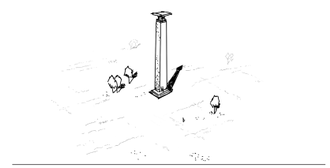
DAY YEAR CENTURY DECAMILLENIUM



BUNKER



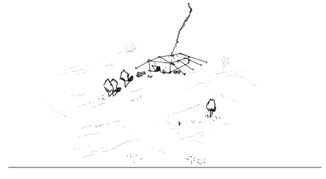
FORTRESS



TOWER

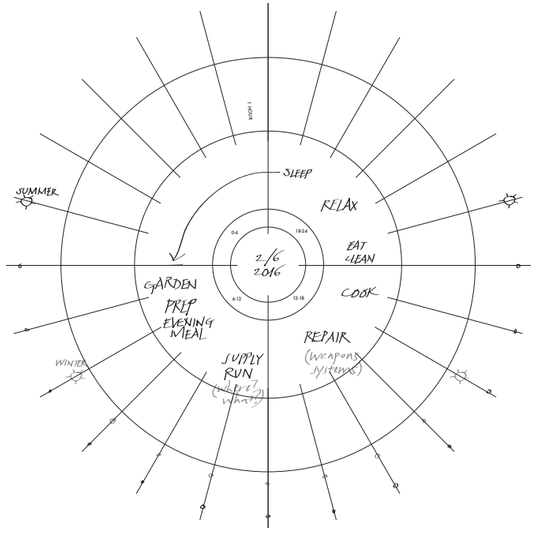
DAM

ISLAND

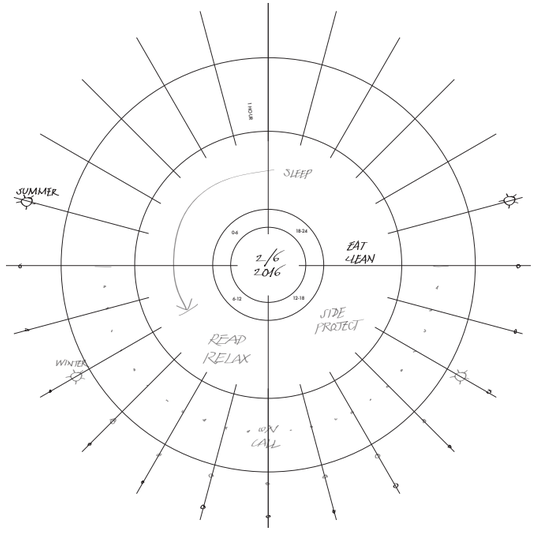


TENT

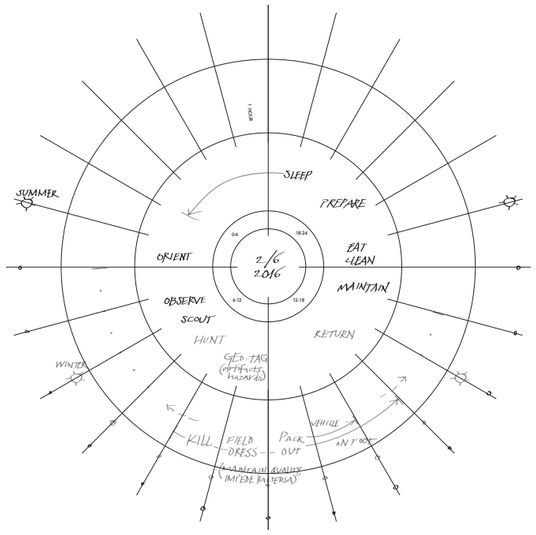
VEHICLE



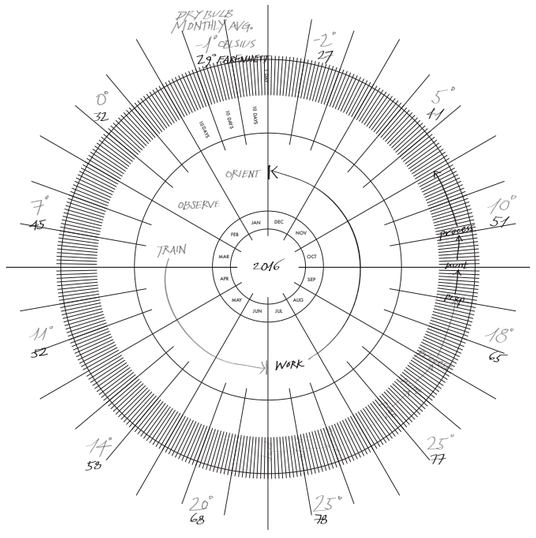
1 DAY PREP



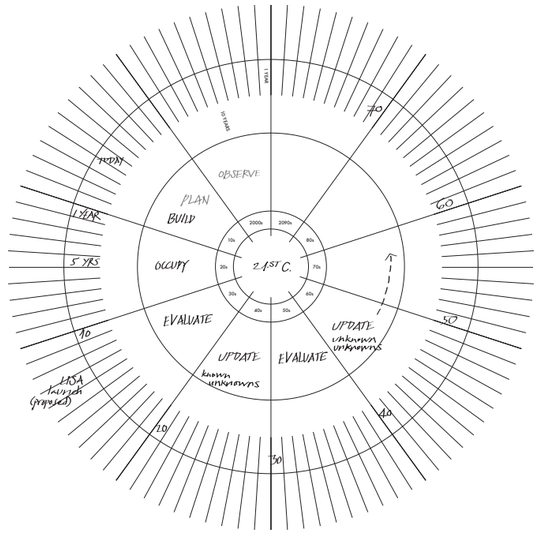
1 DAY LEISURE



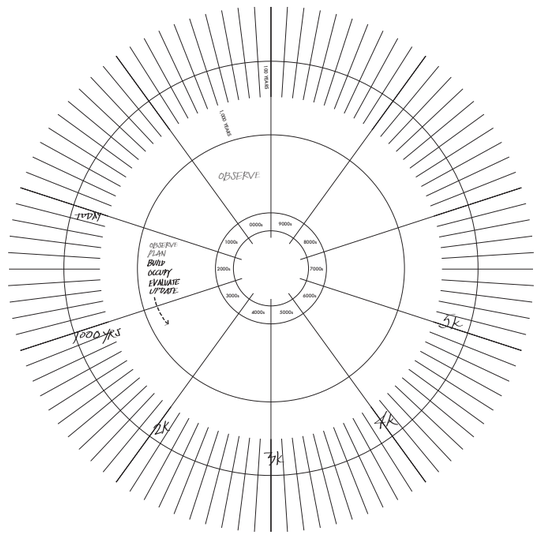
1 DAY HUNT



YEAR

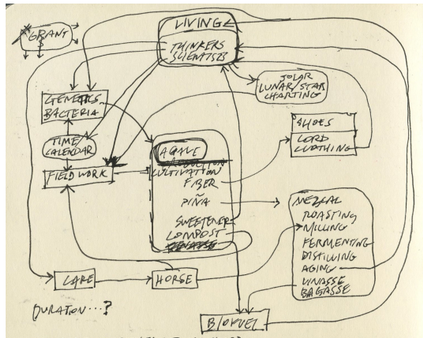


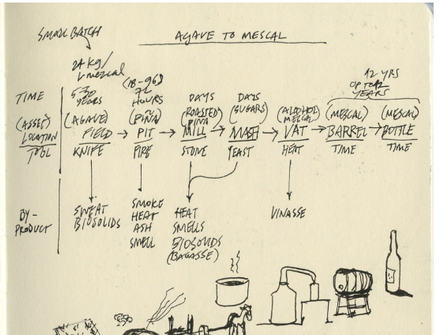
CENTURY



DECAMILLENIUM

APPENDIX B – SKETCHES

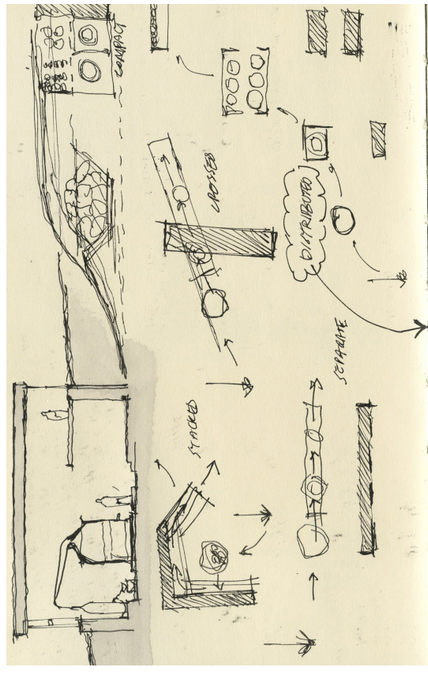




DURATION...?

MONASTIC DISTILLERY @ HANFORD
PRIMITIVE, ARCHAIC, RETURN TO LUNAR/STELLAR NAVIGATION OF RHYTHMIC LIFE, CYCLICAL PRODUCTION

(1) 1 LUNAR CYCLE IS MINIMUM STAY, 1 PERSON (OF 12) MUST COME (TO REPLACE ONE OTHER) AT A TIME, ALWAYS ON A FULL MOON
(2) NO UNNECESSARY WASTE OF LIGHT, TIME, WORDS → BIOFUEL POWERS SCIENTIFIC EQUIPMENT, MECHANICAL SYSTEMS...
(3) SILENCE AT CERTAIN TIMES DURING LUNAR CYCLES → 1 FULL DAY AT FULL MOON, ANOTHER AT SINGLEST MOON AND, ~~BREAK~~ DAILY AT ~~SUNRISE~~ SUNRISE
(4) EVERYTHING ABT. THE PROCESS IS AMENABLE → LAWLESS → LIKE NOMOS, THE GAME IN WHICH ALL RULES CAN CHANGE, THIS IS OPEN-ENDED



(5) CHILE, compared in the most effective ward, not necessarily for the agave/spirit program) but most effective for the full triple-layered thinking the facility is facilitating.
(CLIENT) give us control, like a few other, in order to (a) develop their thinking to a specific variety, difference, location, commitment, and the meaning, artistically, ideologically, and between problems & solutions.

DOORS

(A) 8/4 2016 | 16:00 – 17:15
9"x 3"x 3¼" BOX W/ 3 LARGE VOIDS & SLOTS
6 DRY SCOOPS ROCKITE
2 WET SCOOPS WATER
Little to no expansion after 45 mins, still warm, hard to any bubbles came to surface from hammering, and they appear permanent to the 9x3 open side finish.
Stringy set with last plug - no exit angle and could/will be rotated like the other two

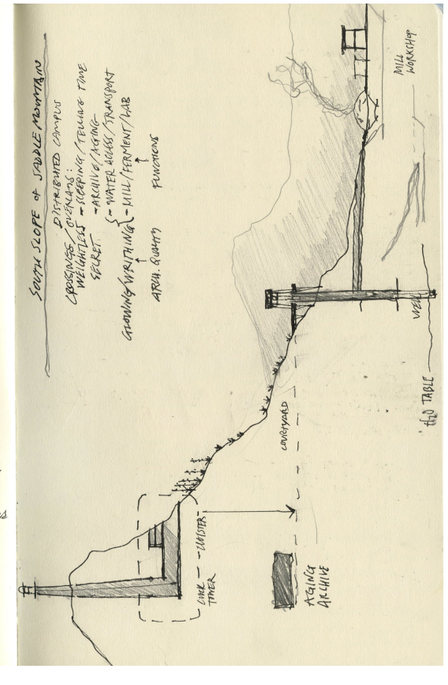
(B) 11/4 2016 | 21:15
9"x3"x1" UPRIGHT BOX W/ COPPER HANGERS & VOID
NB DRY ROCKITE : 3 WATER : ½ WHITE ACRYLIC PAINT
Disaster! I changed the orientation of the last minute & forgot to secure the (top) side at the lower end, causing a rupture and small leak. This was contained reasonably quickly & managed the form to a stable leg which could assist in applying pressure to the wound. Finished the pour after another ¼ mix, placed void & hangers.

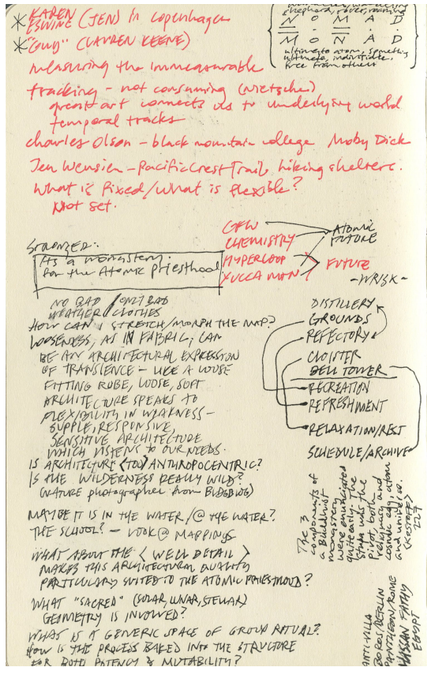
(C) 13/4 2016 | 10:15
9"x 3"x1" UPRIGHT BOX W/ WOOD WEDGE, IRON LEGS
Going to have to saw off clamp - maybe next sliding hook to - able to remove by sliding bottom side and pulling up over legs.

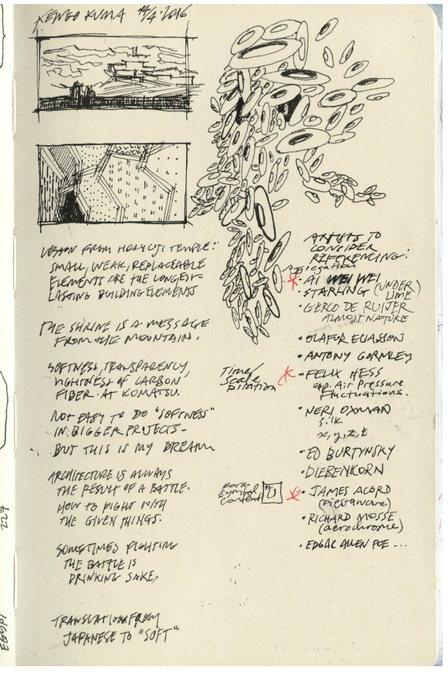
(F) 19/4 2016 | 18:15
9" x 3" x 1" FLAT TRAY W/ PLUG TO HOLD WATER
Used clear for negative - contrasted, raw. Not sure if it will soak up water, so made mix wetter than usual by about 120%

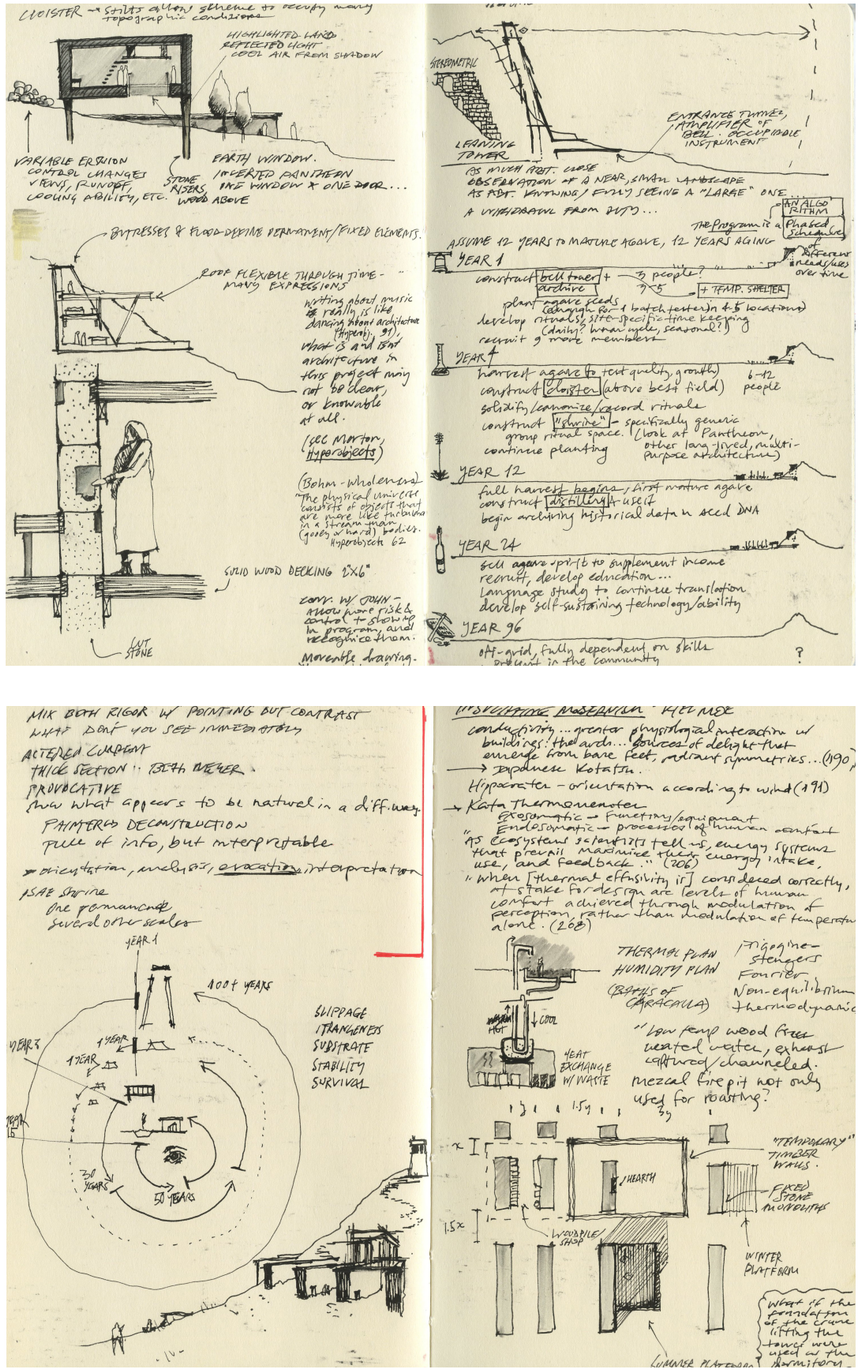
(A1) 27/5 2016 | 21:00
9" x 3" x 1" with wedge/trough cut out, 4 paper legs added coffee grounds to wet 6:2 mix - probably way too wet. Failed in three places - cracks - bound with wood & rubber bands - artifact.

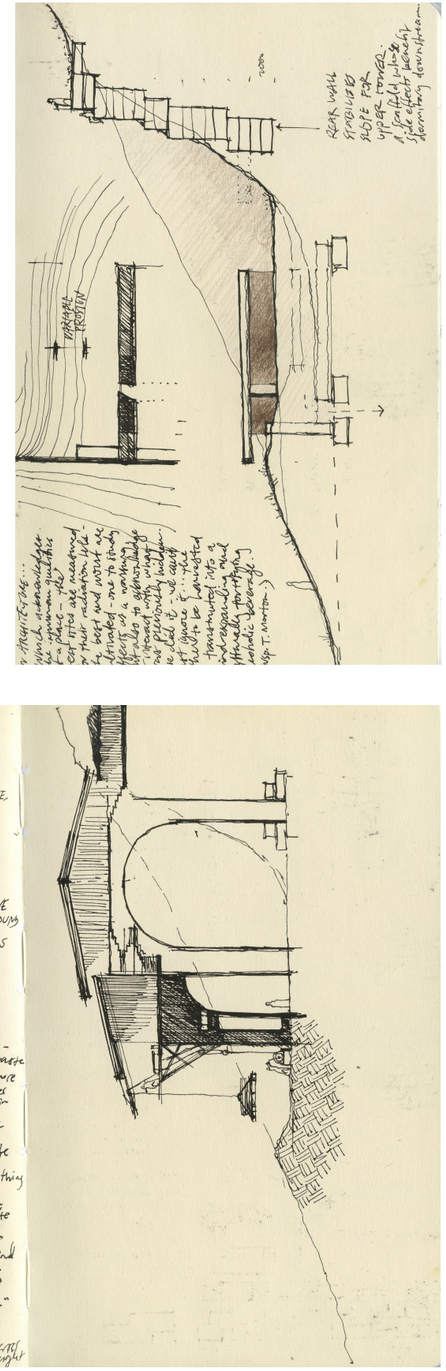
(H2) 29/5 2016 | 11:37
9" x 3" x 1" Same day mold, slight edit of form, now w/ drain hole. adding mesh reinforcement, will make drier mix - 9:2



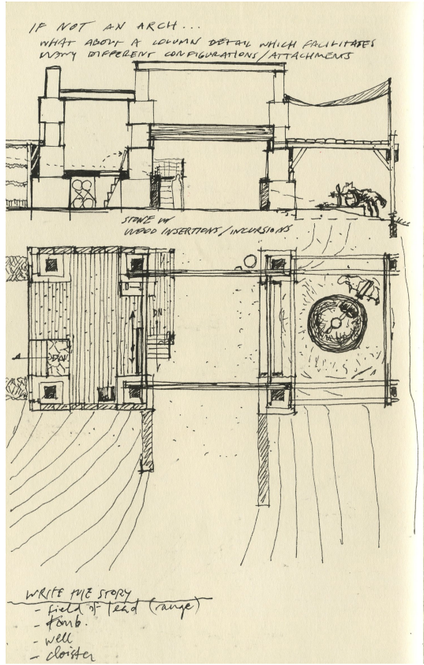


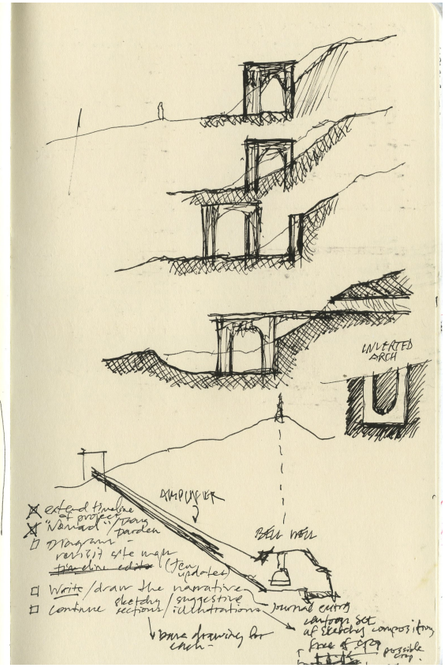


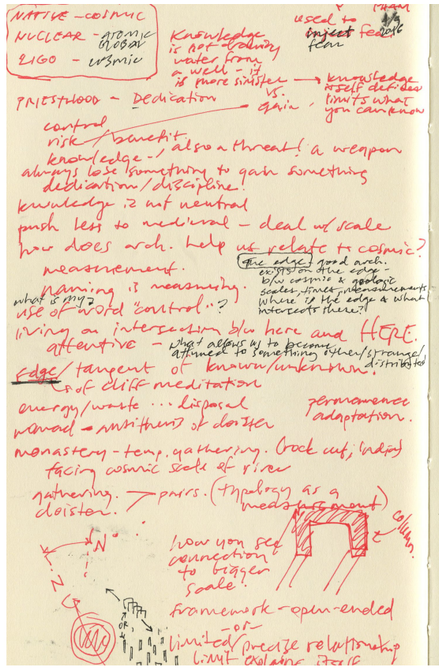

CLOISTER – stable albeit selective to occupy many topographic conditions
HIGHLIGHTED LAND REFLECTED LIGHT: COOL AIR FROM SHADOW
VARIABLE EROSION CONTROL (CHANGES w/ POROSITY, RUNOFF, COOLING ABILITY, ETC.)
STONE RISERS, WOOD ABOVE
EARTH WINDOW. INVERTED PANTHEON. ONE WINDOW & ONE DOOR...
BUTTRESSES & FLOOD-DEFINE PERMANENT/FIXED ELEMENTS.
ROOF FLEXIBLE THROUGH TIME – MANY EXPRESSIONS
writing about music or reality is like dancing about architecture (Hopeful, 97), what is and isn't architecture in this project may not be clear, or knowable at all.
(SEE MATTER, Hyperobjects)
(Bohm-Wholeness) "The physical universe consists of objects that are more like enclosures in a stream-shape (holes or hard bodies." Hyperobjects 62
SOLID WOOD DECKING 2"x6"
CUT STONE
corr. w/ JOHN – allow more risk & control to show up in program, and recognize them.
Movement drawing.
STEREOMETRIC
LEANING TOWER
ENTRANCE THINGS, AMPLIFIER OF SOL – OCCUPIABLE INSTRUMENT
RE MICRO PROT.: CLOSE OBSERVATION OF A NEAR, SMALL LANDSCAPE AS PROT: WATCHING / ESPECIALLY SEEING A "LARGE" ONE
& WITHDRAWAL FROM BOTH...
ASSUME 12 YEARS TO MATURE AGAVE, 12 YEARS AGING
THE Programme is a Phased Schedule
NOT ALSO PATTERN
YEAR 1
construct bell tower + structure
to people?
+ TEMP. SHELTER
plant massive seeds (enough for 1 batch, testing in 4-5 locations)
develop rituals, site-specific time keeping (daily? lunar cycle, seasonal?)
recruit 3 more members
YEAR 4
harvest agave to test quality, growth
6-12 people
construct cloister (above best field)
solidify/canonize/accord rituals
construct "pavilion" – specifically generic group ritual space. (look at Pantheon, other long-lived, multi-purpose architecture)
continue planting
YEAR 12
full harvest begins / first mature agave
construct distillery + use it
begin archiving historical data in seed DNA
YEAR 24
sell agave spirits to supplement income
recruit, develop education...
Language study to continue translation
develop self-sustaining technology/ability
YEAR 96
off-grid, fully dependent on skills & talent in the community
?
MIX BOTH RIGOR W POINTING BUT CONTRAST
WHAT DON'T YOU SEE IMMEDIATELY
ALTERED COMPLEX
THICK SECTION :: 150th MEETER
PROVOCATIVE
show what appears to be natural in a diff. way
PAIMERED DECONSTRUCTION
pull of into, but interpretable
→ disorientation, mediation, evocative, interpretation
ISAE Shrine
One permanent
several other scales
YEAR 1
100 YEARS
SLIPPAGE
ENTANGLEMENTS
SUBSTRATE
STABILITY
SURVIVAL
1 YEAR
50 YEARS
"Hypersensitive Materials" – Kiel Moe
conductivity... greater physiological interaction w buildings: that arch... sources of delight that emerge from bare feet, radiant symmetries... (190)
→ Japanese Kotatsu.
Hippocratic – orientation according to wind (191)
→ Kata Thermoneutral
Exosomatic – functions/equipment
Endosomatic – processes of human comfort
"As ecosystem scientists tell us, energy systems must present metabolic rates, energy intake, use, and feedback..." (208)
"When [thermal effusivity it] considered correctly, at stake for design are levels of human comfort achieved through modulation of perception, rather than modulation of temperature alone. (208)
THERMAL PLAN
HUMIDITY PLAN
(BATHS OF CARACALLA)
Prigogine – Stengers Fourier Non-equilibrium thermodynamics
HOT
COOL
HEAT EXCHANGE W/ WASTE
"Low temp wood fired heated water, exhaust captured/channeled. Mezcal fire pit not only used for roasting?"
1.5x
"TEMPORARY" TIMBER WALLS.
HEARTH
FIXED STONE MONOLITHS
WASHABLE SHOP
WINTER PLATFORM
Wood is the foundation of the crane lifting the stone were used on the dormitory

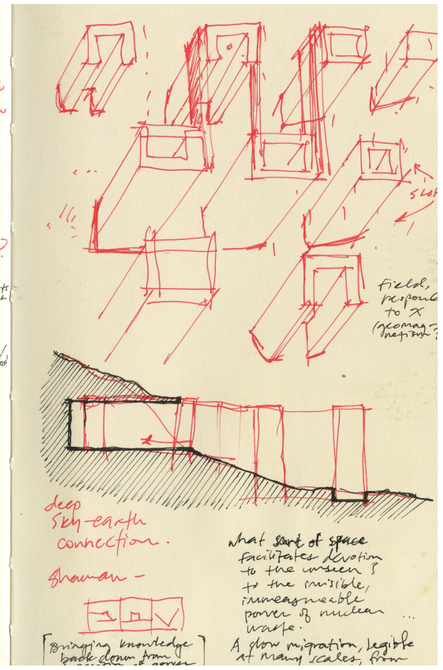

REAR WALL SIMILAR TO SLOPE FOR UPHILL TOWER. SLOPE FOR SLOPE DOWNSTREAM
PARAPET FRONTON
...straightens...
...wind, camouflage...
...human qualities...
...in place with...
...ed, formed...
...their relation to...
...t, boat and water as...
...dramatic - one to study...
...specific as a warning...
...to also to give shelter...
...round with wings to...
...ed. Possibly hidden...
...ed to be constructed...
...treatment into a...
...ed, regenerating rock...
...ultimately portions...
...periodic intervals.
(Hop T. Morton...)

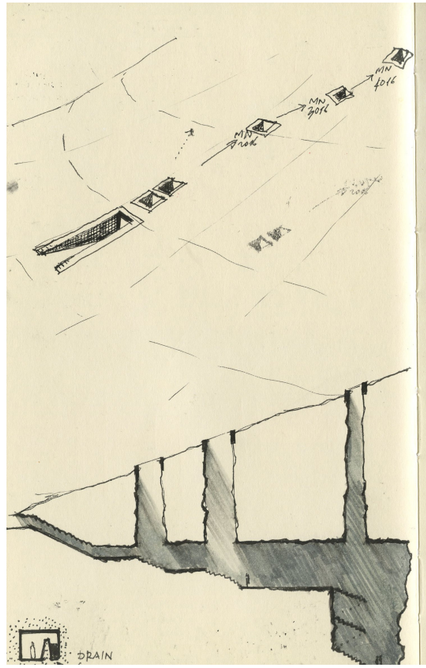
NEGOTIABLE WORK
BUILD UP AROUND GROVE, DISASSEMBLE BUT LEAVE SKELETON?
ROOM I
ROOM II
TRAIL
FELT COVERED BOX OPEN ON ONE SIDE
EXCESS STONE PLACED AROUND TOWER IN MAX RADIUS
QUARRY TO WELL
– OR –
WINCH/CAPSTAN
(Hyperobjects on A.P.)
Wisdom, Groundinghog – creating medical waste
Weakness in Architecture
- weak reality allows for interpretation in representation
- weak (ie, soft) ness relates to the fleeting human life
Work together/make something
Enjoy community
Take responsibility/create waste
Departure from School – "out of sight, out of mind" is strictly untenable. There is no "away" to throw plutonium in." "Morton, 114"
4x4 SIDED OBJECT COVERS
TO TRAIN
5'(1)
what if x & y were acted with height
its just a tessellation.

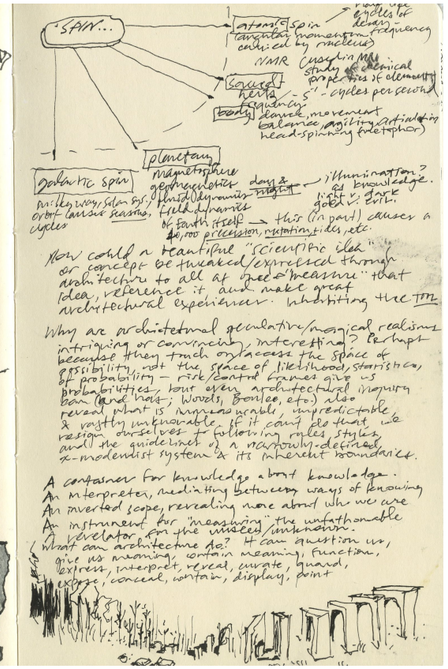

IF NOT AN ARCH...
WHAT ABOUT A COLUMN DETAIL WHICH FACILITATES MANY DIFFERENT CONFIGURATIONS/ATTACHMENTS
STONE W/ WOOD INSERTIONS/INCISIONS
WRITE THE STORY
- field of text (range)
- tomb
- well
- cloister

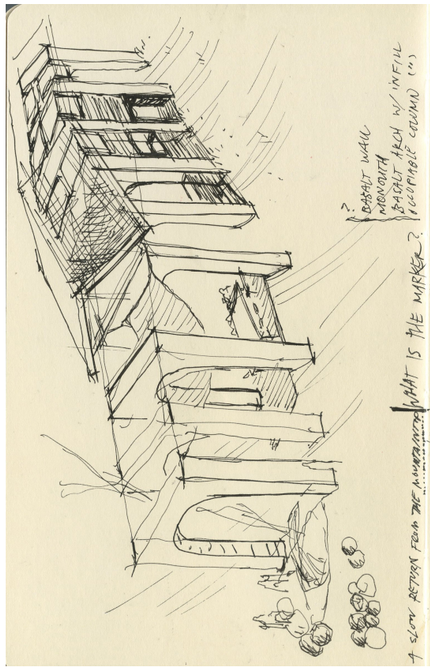

INVERTED ARCH
RAMPING UP
BERM WALL
extend timeline of project/ramp
Narrative/garden
diagram - revisit site work (few updates)
Write/draw the narrative
continue sketching/suggestive sections/illustrations
journal entry
continue set of sketchy compositions
base drawing for each
possible

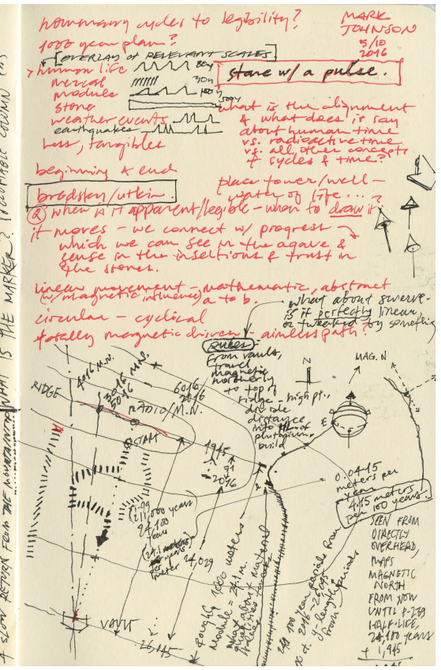

NATIVE - COSMIC
NUCLEAR - ATOMIC GLOBAL
LIGO - UNIVERSE
Knowledge is not draining water from a well - it is more similar to → knowledge itself deepens
PRIESTHOOD - DEDICATION vs. GAIN
knowledge limits what you can know
control
risk / benefit
also a threat! a weapon
knowledge - always lose something to gain something
dedication / discipline!
knowledge is not neutral
push back to medieval - deal w/ scale
how does arch. help us relate to cosmic?
measurement.
naming is reasoning.
what is myth use of word control?
living an intersection b/w here and HERE.
attentive - what allows us to become attuned to something other/strange/
edge / tangent of known/unknown!
of cliff meditation
energy/waste ... disposal
nomad - nutrition of desert
permanence adaptation.
monastery - temp. gathering. Rock cut, island facing cosmic scale of river
gathering. cloister.
pairs. (typology as a measurement)
how you see connection to bigger scale!
framework - open-ended
limited precise relationship

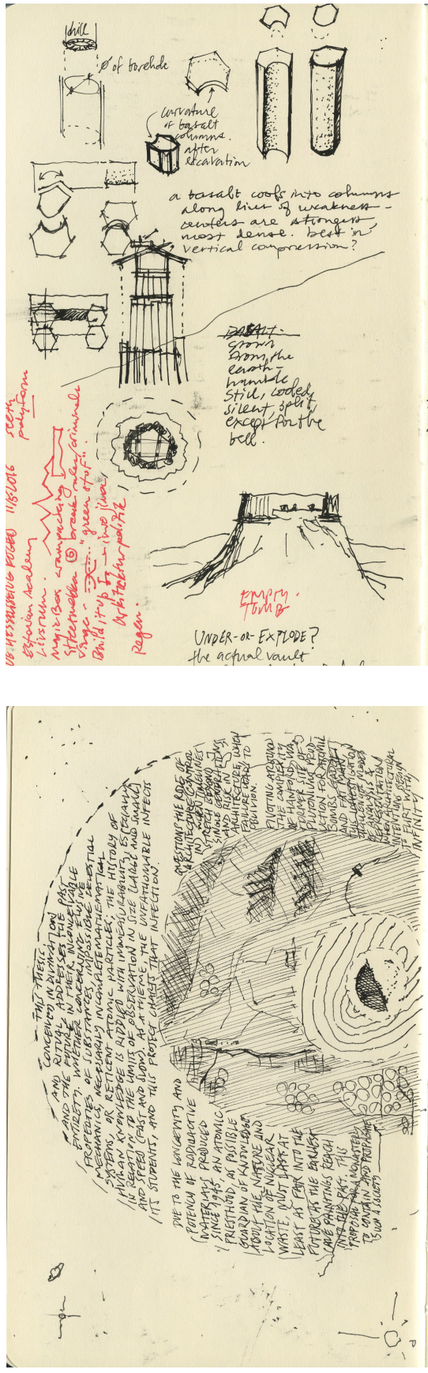

deep sky-earth connection.
Shaman -
Bringing knowledge back down from
Field, response to X (meaning, metaphor)
what sort of space facilitates relation to the unseen? to the invisible, unmeasurable, power of nuclear waste.
A slow migration, legible at many scales, from

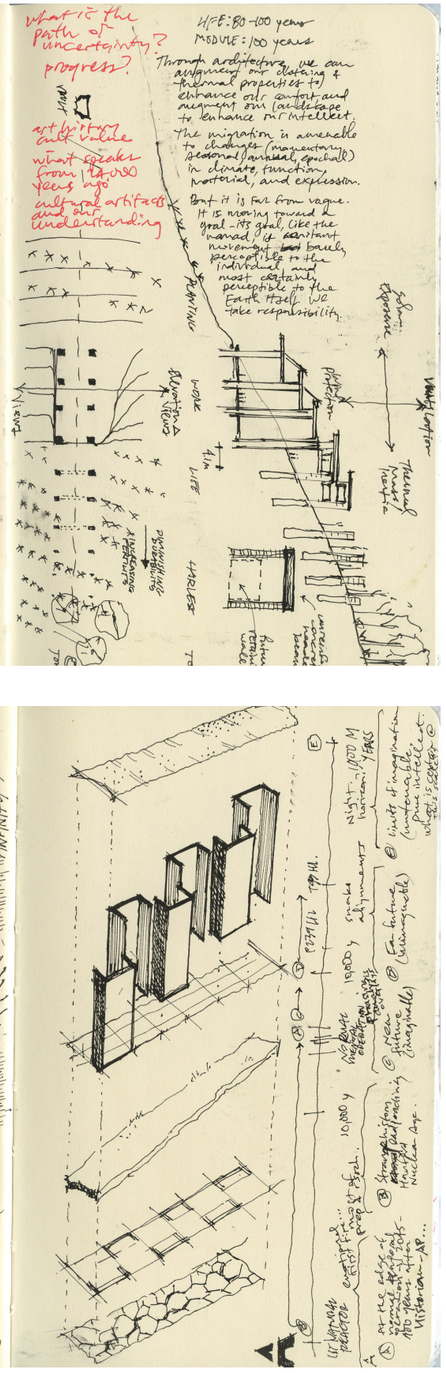

MN 2016
MN 2015
MN 2010
DRAIN


"STAR..."
atomic spin
angular momentum
NMR
Geological
Earth's movement
balance, gravity, vertical
head-spinning metaphor
planetary
Galactic spin
magnetosphere
day & night
illumination?
Milky Way, Solar sys.
Earth's dynamics
light vs. dark
orbit, axial tilting
field dynamics
cycles
Earth itself → this (in part) causes a
4K,700 precession, nutation, tides, etc
How could a beautiful "scientific idea" or concept be tweaked/expressed through architecture to allow "measure" that idea, reference it and make great architectural experiences. inhabiting the 4th
Why are architectural speculative/magical realisms intriguing or convincing, interesting? Perhaps because they reach out/access the space of possibility, not the space of likelihood, statistics, or probability - risk/control frames give us probabilities, but even architectural imagery (arch, vaults, domes, etc) also reveal what is imagined/made, unpredictable & mostly unknowable. If it can be that we restrain ourselves to following rules, styles and the guidelines of a narrowly-defined x-modernist system & its inherent boundaries.
A container for knowledge about knowledge.
An interpreter, mediating between ways of knowing
An inverted scope, revealing more about who we are
An instrument for "measuring" the unfathomable
An elevator for the unseen dimension.
What can architecture do? It can question us, give us meaning, contain meaning, function, express, interpret, reveal, create, ground, expose, conceal, contain, display, point


BASALT WALL
MONOLITH
BASALT ARCH W/ INFILL (FLAMMABLE COUNTER)
WHAT IS THE MARKER?
A SLOW DEPOSIT FROM THE ANTHROPOCENE

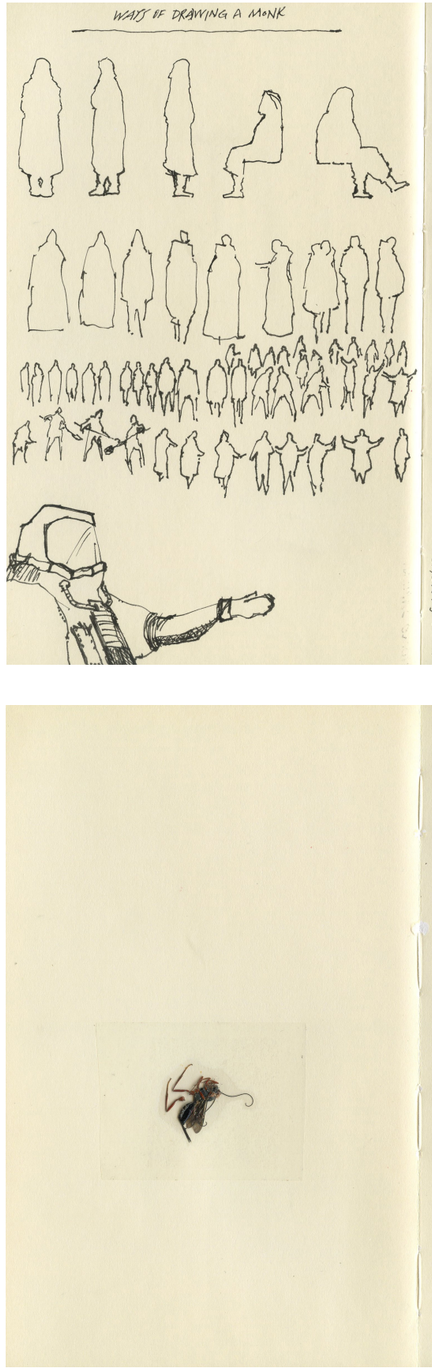

MARK JOHNSON
5/10
2016
stone w/ a pulse.
What is the alignment & what does it say about human time vs. radioactive time vs. all other concepts of cycles & time?
place tower/well - vastness of life ... ?
When is it apparent/legible - when to draw it
it moves - we connect w/ progress - which we can see in the agave & sense in the insertions & trust in the stones.
linear movement - mathematic, abstract (w/ magnetic influence) a to b.
What about swerves - is it perfectly linear or tweaked by synaptic
circular - cyclical
totally magnetic driven - aimless path?
RIDGE
MAG. N
VAULT
0.04°15 meters per year
4415 meters 100 years ago
SEEN FROM DIRECTLY OVERHEAD
MAPS MAGNETIC NORTH FROM 2010 UNTIL 2739 HALF-LIFE, 24,120 YEARS

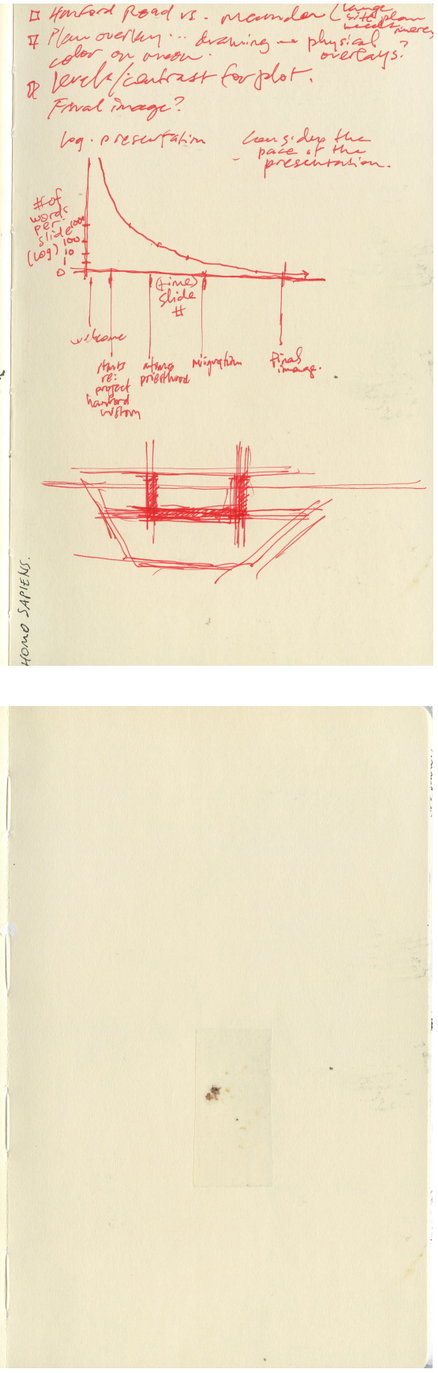

Ø of borehole
curvature of basalt columns after excavation
a basalt cools into columns along lines of weakness - centers are strongest most dense. best in vertical compression?
grows from the earth - ingenuity still, cooled, silent, spirit except for the bell.
UNDER-or-EXPLODE?
the actual value?

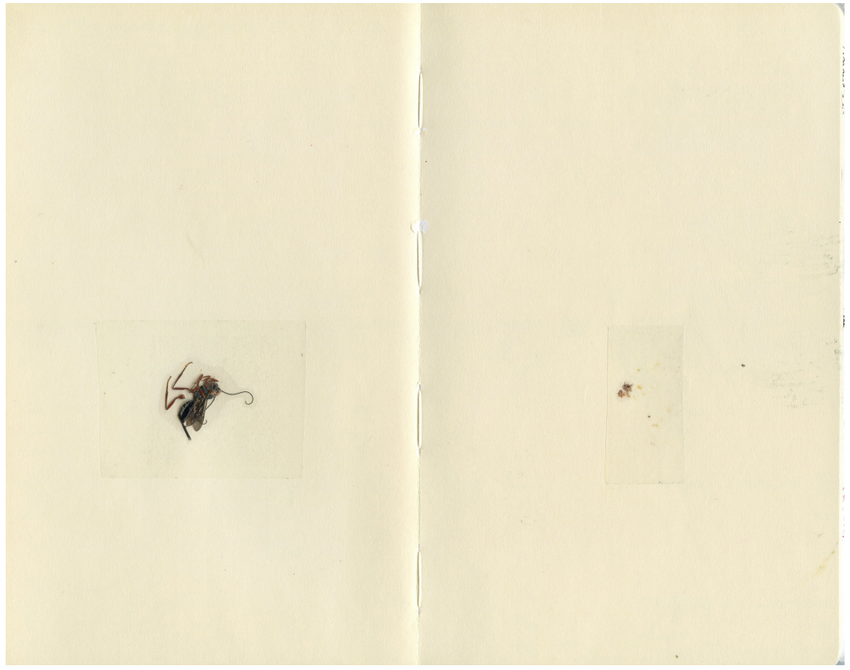

what is the path of uncertainty? progress?
art/artifact cult value
what speaks from 1 to 40,000 years ago
cultural artifacts and our understanding
LIFE: 80-100 years
MODULE: 100 years
Through architecture we can augment our climate & thermal properties to enhance our comfort and augment our landscape to enhance our intellect.
The migration is amenable to changes (magnetism, seasonal/annual, gradual) in climate, function, material, and expression.
But it is far from vague. It is moving toward a goal - its goal, like the nomad, is constant movement easily perceptible to the individual and most certainly perceptible to the Earth itself. We take responsibility.

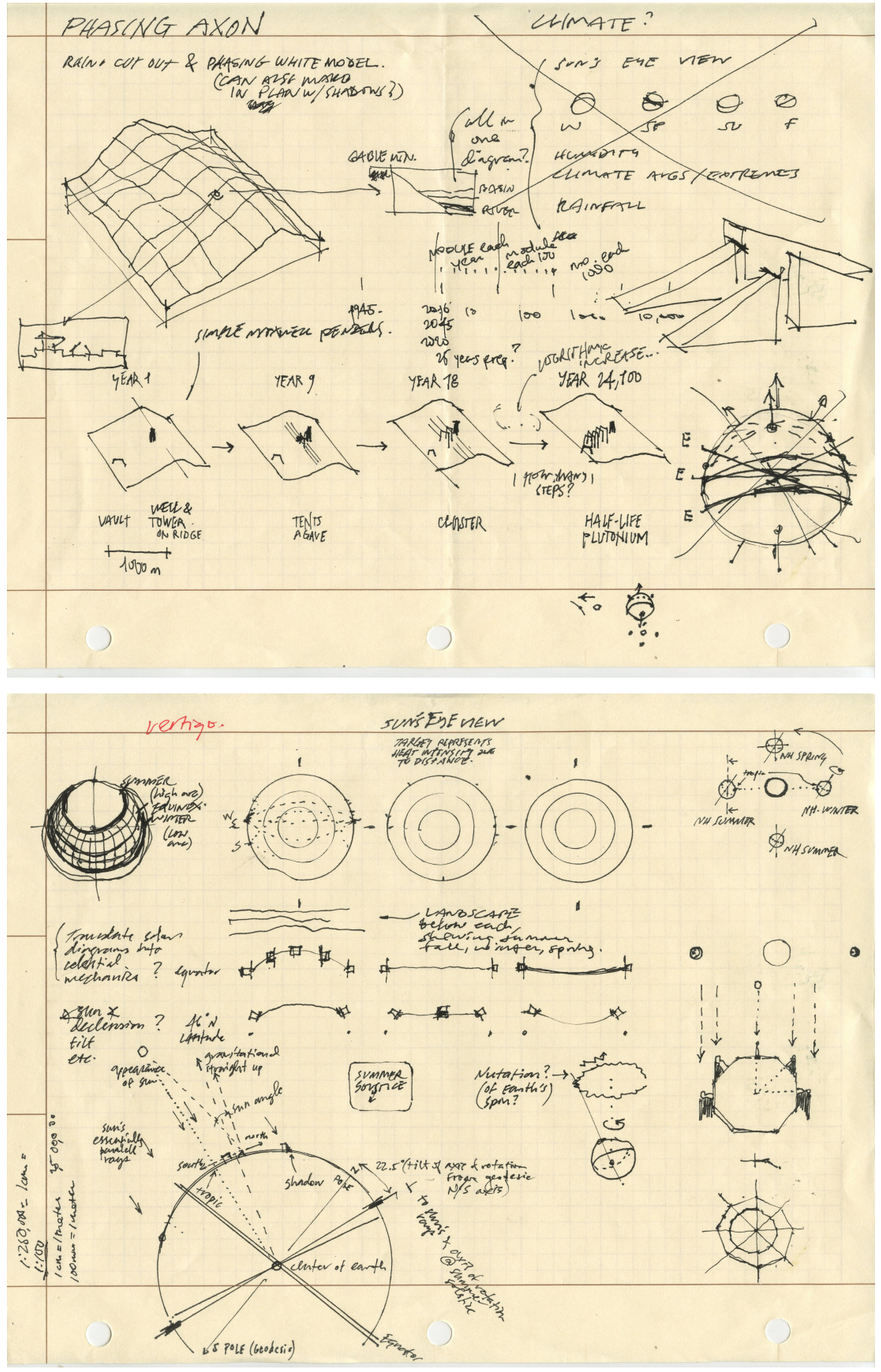
AND RITUAL ADDED TO THE EVIDENTLY WHERE NOMADIC LIFE PROFFERED OF LIBATIONS, INCONCEIVABLE IN ANIMALS, NECESSARILY INCONCEIVABLE IN MAN, THE HISTORY OF MANKIND IS ADDED WITH THE HISTORY OF ITS OBJECTS TO THE UNITS OF OBSERVATION IN SITE LANDS, RESEARCH AND STORIES, AND THIS PROJECT CANNOT THAT INFECTION / ITS STUDENTS, AND THIS PROJECT CANNOT THAT INFECTION
DUE TO THE UNIVERSITY AND POTENCY OF RADIOACTIVE WASTE WHICH WILL REMAIN DANGEROUS FOR 10,000 YEARS, AN ATOMIC PRIESTHOOD, AS PUBLIC GUARDIAN OF NUCLEAR WASTE MUST EXIST AT LEAST AS FAR INTO THE FUTURE AS THE BUILT CAVE PAINTINGS REACH INTO OUR PAST. THE PROPOSED MONUMENTS TO ENTAIN AND PRESERVE OUR SOCIETY
ATTRACTING THE CURIOUS FROM THE DISTANT FUTURE, THE MONUMENTS WILL BE DESIGNED TO WITHSTAND THE RAVAGES OF TIME AND THE ELEMENTS, AND TO ENTICE THE CURIOUS TO VISIT THEM. THE MONUMENTS WILL BE BUILT ON THE SITE OF THE PRESENT NUCLEAR WASTE DUMPS, AND WILL BE DESIGNED TO LAST FOR AT LEAST 10,000 YEARS.
PUSHING THE EDGE OF TECHNOLOGY AND KNOWLEDGE, SCIENTISTS AND ENGINEERS HAVE BEEN ABLE TO CREATE MACHINES AND DEVICES THAT ARE CAPABLE OF PERFORMING TASKS BEYOND THE CAPACITY OF THE HUMAN BODY. THE MONUMENTS WILL BE BUILT ON THE SITE OF THE PRESENT NUCLEAR WASTE DUMPS, AND WILL BE DESIGNED TO LAST FOR AT LEAST 10,000 YEARS.
FLOATING AROUND THE EARTH IN THE FUTURE, THE MONUMENTS WILL BE BUILT ON THE SITE OF THE PRESENT NUCLEAR WASTE DUMPS, AND WILL BE DESIGNED TO LAST FOR AT LEAST 10,000 YEARS.
INFINITY

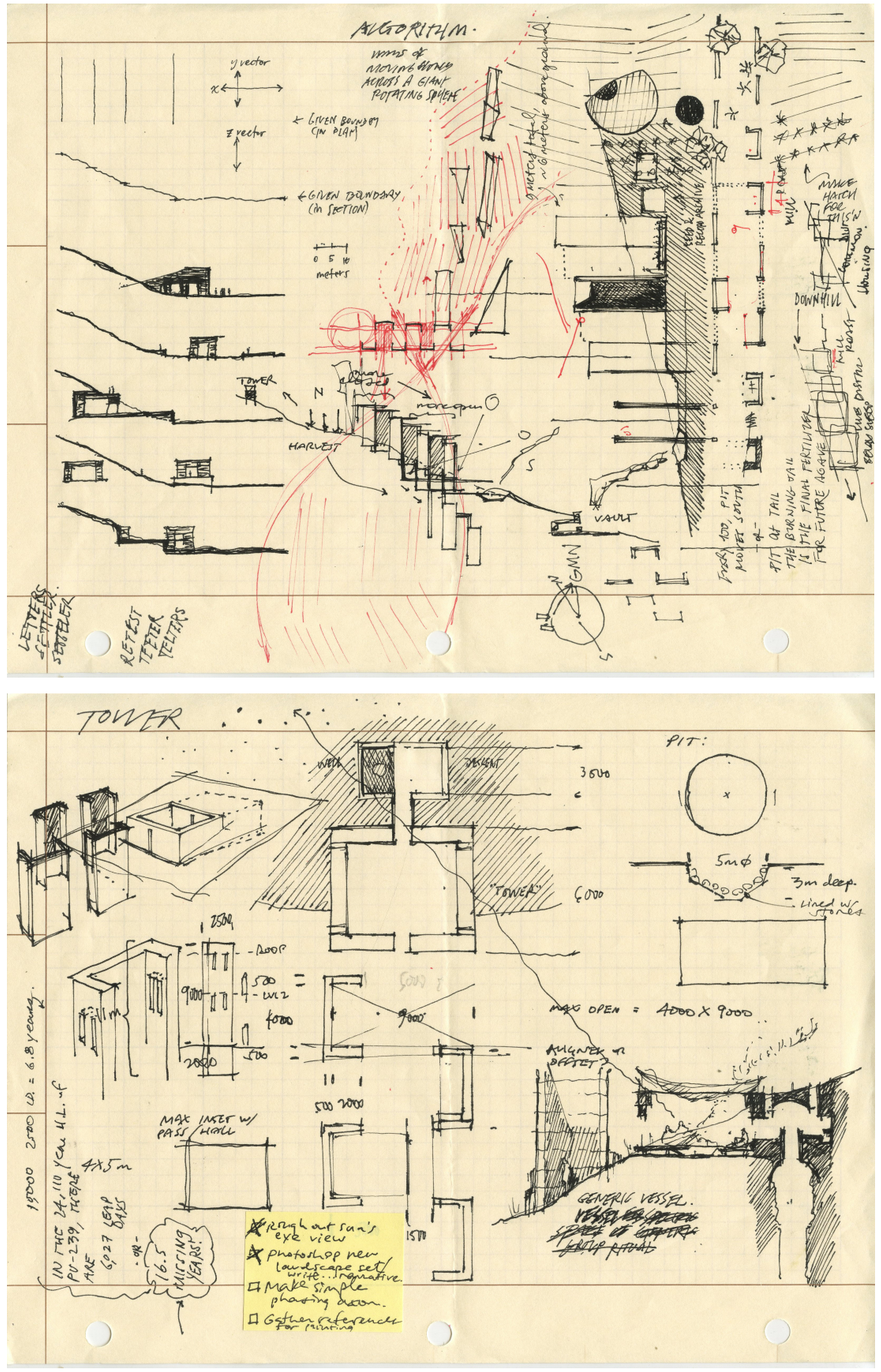
10,000 y
1000 y
Night - 1000 M
Human - YEARS


WAYS OF DRAWING A MONK


Hanford Road vs. meander
Plan overlay ... drawing as physical overlays.
color or vision.
levels/contrast for plot.
Final image?
Log. presentation
Consider the pace of the presentation.
# of words per slide (log)
(time) Slide #
welcome
Hints re: project handout written
Atomic priesthood
Migration
Final image.
HOMO SAPIENS.




PHASING AXON
CLIMATE?
RAIN: CUT OUT & PHASING WHITE MODEL.
(CAN ALSO BE MADE IN PLAN W/ SHADOWS?)
SUN'S EYE VIEW
all in one diagram?
GABLE WIN.
ROOM
ROOF
HUMIDITY
CLIMATE AVGS/EXTREMES
RAINFALL
MODULE each year
module each 100
no mod 1000
PASS.
2016
2045
2100
25 years ever?
SIMPLE MYTHICAL BEINGS.
ALGORITHMIC INCREASE...
YEAR 1
YEAR 9
YEAR 18
YEAR 24,100
(How many steps?)
VAULT
WELL & TOWER ON RIDGE
TENTS AGAVE
CLUSTER
HALF-LIFE PLUTONIUM
1000 m
vertigo.
SUN'S EYE VIEW
SUMMER (high sun) EQUINOX WINTER (low sun)
TARGET REPRESENTS HEAT INTENSITY DUE TO DISTANCE.
W
E
S
JAN SPRING
JULY
JUL. WINTER
JAN SUMMER
JUL SUMMER
LANDSCAPE below each opening: human fall, wind, sun, spring.
Translate solar diagrams into celestial mechanics? Equator
Sun x declension? tilt etc.
N.C.N Latitude
appearance of sun
gravitational straight up
sun angle
north
sun's essentially parallel rays
south
tropic
shadow pole
22.5° tilt of axis & rotation from geodesic N/S axis
center of earth
Equator
65 POLE (geodesic)
SUMMER SOLSTICE
Nutation? (of Earth's) Spin?
1:128.08 = 1cm = 1:100
1cm = 1meter
100cm = 1meter
50 deg 00
SUN'S EYE VIEW
SUMMER (high sun) EQUINOX WINTER (low sun)
JAN SPRING
JULY
JUL. WINTER
JAN SUMMER
JUL SUMMER


ALGORITHM.
y vector
x
z vector
GIVEN BOUNDRY (in PLAN)
GIVEN BOUNDARY (in SECTION)
0 5 10 meters
WAVE of MOVING FORCE ACROSS A GIANT ROTATING SPHERE
DIRECTION of ~6 METER/YR ANNUAL GROWTH
MAX HEIGHT REACHABLE
WAVE HATCH FOR MISTING
DOWNHILL
TOWER
HARVEST
VAULT
GIMN
LETTERS LETTERS SCATTER
RETEST TETEK TELTERS
TOWER
VENT
"TOWER"
6000
3500
-1000
500
-1112
9000
5000
20000
500
3000
9000
MAX OPEN = 4000 X 9000
MAX INSET W/ PASS WALL
45.5m
15m
PIT:
3650
5m ϕ
3m deep.
- lined w/ stones
ANGLE OF REPOSE
GENERIC VESSEL.
18000 2500 12 = 6.8 years.
IN THE DAY-110 YEAR H.L. of PU-239, THERE ARE 6027 LEAP DAYS
-ish- 16.5 MISSING YEARS!
Rough out sun's eye view
Photoshop new landscape set/ write. Imaginative.
Make simple phasing diagram.
Gather references for framing

APPENDIX C – STORIES

20160106: She wasn't any closer to the top. She was certain she had seen at least one top from the ground, but the haze in the morning can be so dense. And the eyes play tricks. And the glasses can fog up from the vents so badly that one's own nose is nearly invisible. She continued anyway, perhaps less because she meant to than because her feet didn't easily stop carrying her forward, and up, and around. If they had been steps or rungs, she could have counted them. She recorded her progress, instead, by fatigue. When her left leg started pulsing several hours ago, that was a milestone. She stored it in memory with the requisite memorized gesture – the left thumb and forefinger pressed together, tracing three slow ellipses in the space before her as she marched methodically forward, and up, and around, the gravel crunching softly beneath each step like the soft, steady murmur of a machine and the hum of the towers like some atavistic wind organ playing tones which last for centuries and pieces with no beginning. Is this a machine, she wondered. Am I a machine?

20160107: Four walls, ten meters high and long, and a dime-sized opening in each. The voids are centered horizontally, and roughly eye-height when seated. Anyway, for as long as I can remember, there has been no reason to stand. I know only the night and the day, and the exact position of every shadow on every wall for each moment of each revolution of the prison, and its slow path around a bright sphere. And of course, the position of each imperfection in the walls, and the way the atmosphere in this place in the winter months once created various glittering crystals in each of them, whose slow vanishing with the light was almost like tasting food again. There is no longer a fast or slow. No more sense of movement. Time occupies each moment equally, and any continuous notions of space have, like my own breath, long since vanished from my attention. Perhaps I'm imagining all of this, but I can see the difference between moments. Xeno…you were wrong, old friend. I have seen the universe disappear and reappear again, in a frame rate so tangible and obvious to me that I can't see the animation any longer. There is a fearsome darkness in the gaps, when the four openings around me are filled with the many eyes of the other prisoners, whose vigilance, beyond understanding, sustains the persistence of an illusion.

20160109: We were born into the feedback of a vast unknowable works, the function of which has long since been lost to the pages of an incomplete, indecipherable history. The makers rebuilt themselves many times over, and they rehearsed their functions until they could no longer forget, but we can no more easily intuit the meaning of the movements of the machines than we can the function of the red liquid flowing through us, or the hard white scaffolding that remains after our inevitable passing. Before I felt my own skin split and peel against the hot engines, I couldn't have described which of the various things around were me and not me.

20160112: We shed clothes and come to float at the surface. Our eyes adjust to a dim light. Forms and new depths in the soaring space above us reveal themselves slowly, and we devour their reluctant appearing. Black steel and dirty aluminum in intestinal patterns, looped and locked into a logic, regulated by tolerance and degrees of freedom torques against itself in mess of entanglement at once singular and fragmented. A discovered digital archive gave us essential knowledge related to repairs and revisions, so we admire the belly first on its own functional terms, and secondly for its compositional purity. There is much work ahead – she will operate again, but there is only one chance at an ignition. Were a single seal breached, or a valve improperly reassembled, or a sensor mis-calibrated, the ship would implode on us and there were no survivors from the wreckage of those before us. We've never seen a failed launch, but we know this to be true. We breathe and twist and yaw and sink, as a blurry oxygenated antipode retreats, and a new horizon activates our eardrums and lungs. Swimming slowly in the cavernous cooling tank, one could almost imagine the outside again. Imagine the weight of gravity holding all those gases down against the surface of the heavy water. Imagine a naturally filtered sunlight. Imagine a shadow and a journey and a return.

0020160126: We've never known how to personify the landscape. No way to bring a scale to bear, other than the immeasurable. Children can understand the emptiness. They know that in other worlds, the stars are somehow present, granting much more than just heat, and people even walk around on the outside. Knowing the supreme hollow of our planet, however, and that we're unable to hear the other side from in here…this is something that takes half a life of consideration just to formulate as a construct. Origin stories are always telling - they believe (in Earth, for example) on an enormous flat plane, which can be stepped out of. Our myths involve an immense hand, so big we couldn't hear the fingers keeping the sound out. Born from individual womb into global womb. There is no intermediate. The others, of course, naturally grant a normalcy to the heat range of our bodies. But if not for those data on the proximity of others, the void would certainly overwhelm us. We have heard, as well, that those in Earth have an insatiable desire for consumption. We find it difficult during one feeding to consume more than the amount of condensation that collects in a rock during one cycle. We consider food on volumes that they consider volumes of weather. We measure all things in accordance with our bodies, relative to those around us, and relative to the environment. But language has no scale. Binary has no height or width. We haven't felt each other, that we know of. But the one I communicate with, for a few minutes each kilocycle when the ocean is briefly full of light and we feel equally strange pain and physical ecstasy until it is gone, is almost certainly at most a tiny fraction of my age. The radio frequency we use, for example, has a specific wavelength, and we know that sound in a vacuum travels this far in one lifetime.

0020160126: The chemical history of each molecule in the mixtures will both be tracked and logged assiduously. The temperature and pressure of the vessel maintained with utmost attention throughout the duration of the experiment period. Mistakes, fluctuations, anomalies are recorded at the end of each working phase with precision. The clean room remains so, and so forth. But remember, the measuring tools designed, fabricated, calibrated nearly beyond the limits of our collective knowledge and testing ability to verify values with utmost accuracy are but an extension of your mind. The laser interferomter is a cup of water. The telescope is but a pair of glasses. The power of the assembly you'll inhabit for the coming years is nearly unlimited, and the space itself is now your garment. You're part of this ecology now, and in the most intimate and organic sense. Your functioning and the station's are dramatically intertwined. Performance is a function of upkeep and morale. Lubrication involves both oil and water. The gear efficiency calculation involves both meters per second and kilometers per second. Microns and neurons. Lobes and ledgers. Do not, under any circumstances, mistake the machine as something outside of you. You are alone in the vacuum of space. To be sure. But your body itself, if you choose to make that distinction, is no more alone than your bones or your organs or your backup oxygen supply and rebreather.

0020160128: Toxic anathema. Plaguing negation. Tremulous void. A looming shiver. What fuels this mighty hovering chorus of ancient images transposed into ever-expanding vessels? The night and its antecedent, whatever that is. A ruinous riptide. What are we, if not lightning flashes glancing off a heavy cloud of atavistic gladiatorial violence, which, in time must climax and dissipate, like all

other expenditure? The colorful leech of excess. What are we making anymore? An interpolation? A logistic framework? What prefigures desire, or is it simply desire we're producing? Or the longing for it? We continue pumping, ignoring the compromised tank. The fuel up around our ankles, but if one can jump in fast enough and drive away, perhaps one can reframe the problem, determine an efficient solution, and implement radical innovative solutions before the spill catches up with the crippled vehicle. Put this disaster into context. Look at the data. We will file calmly out of the arena. There is always a solution. A transition. A phased approach, in combination with a highly tuned six-sigma strategy for cross-platform implementation, creating synergetic value in a complex, increasingly multi-tiered, competitive global market stretching across lubricated back-office functionality, recursive hardware optimization, performance metrics, and integrated supply-chain regression analysis keeping your interests at the heart of your optimized operational dashboard monitoring assets, depreciation, and blood loss across a statistically rigorous…

0020160202: After waking with the subtle fear that he wouldn't be able to record with clarity, and without banality, specifically what was on his mind, the crumbling author started out: Dear reader, let me begin with the following apology: I beg your pardon but for the following reasons [scribbled illegibly in the margin later, in haste, after being neglected], the following, below the standard one might expect from the sort of establishment I represent, must be taken with a heavy grain of salt, followed by a glass of heavy grain alcohol, forgive me, but – sense itself doesn't make sense anymore. The gravity of what he had written stuck immediately upon his intellect with the presence of a phantom, or a hovering void, or a claw who's shadow he couldn't quite see, but certainly sensed: Speed lost focus. The inevitable cant of a familiar hill began to draw him into well-worn paths of verbs and their victims: But in the loss, I drag deeply on the background. Each new sentence, a kind of magnificent return, smiled in the most affectionate and genial way: Free of locus. Oh, the rapture: Quartered by odds. And, finally lubricated by the structure: Bent in the countdown. He couldn't have stopped it: Mention of octaves. But time wouldn't have that: The tempo was caustic. And fighting would only spawn more to respond to: Infested with honesty, driven to draw through. The narrator lingered as long as he could, but despite his best effort the under text wouldn't respond to an antidote, writhed and the spawn of infested illexicons crept up and stood on the doorway to lexical inbreeding shouldn't be nailed up stale there like old rotten wood and rehash simple rote figurational laws which rehash ill-conceived preconditions to law on which literature stood as if technical goodness were everything. The indecent formulation almost startled me, in fact, and when the voice subsided, I found an unanticipated clarity…elusive, reclusive, or just dormant for some time. The language was but a large homemade glass, held over the subject as obfuscation. The remnant impurities and slight errors in the floating serve merely to hide, whether accidentally or less so, any irrelevant qualities. This reveals the story in a much subtler way and, in my opinion (ostensibly his), more honestly. If only he were here to read the maddening genius I get into when he's not around…

0020160211: Out on the fringes of the camp, the small band and the clear faces of its members, and the low light described a softness of composure in which each note in harmony added orange, and all the moments of dissonance, red against the deepening black of the emptiness beyond. The instruments and voices blend, as one can imagine, in a typical, unsurprising dream-like unity which transcends expression itself and moves viscerally in the attendant group, as if the melodies were physically present in their bodies, though technically this is always the case, even in unpleasant music. Brief eye-openings and the resultant fiery flicker, momentary interruptions in the stillness. The throaty crack of a log in a formation only important for warmth. The new distance in memory from the other camps and their symmetrical performances deposited another layer of shared experience, moving toward nostalgia in time. As these times gradually become the past, new accretions compressing older ones night after night into an increasingly self-similar and consistent whole, the band and its followers grew together. In the consumption of the day, an equation of fuel and food and water pre-figured from the beginning and executed with relaxed, or rote specificity, the members became individuals again. However, after canvassing the small arc across their mutual circular path between various supply points and unmapped voids, the restlessness of the creeping light resolved again in sundown and simplicity. The visual sense, weak and uninspiring, used for the most base forms of information gathering and communication, subjected finally to the high-definition of a culture for whom listening carefully in darkness preceded seeing in the light. In their definition, the universe began with the momentary pause of an eternal pervasive whisper, deep, and everywhere at once. Sound imploded. The sudden absence of noise created, in its brief absence, everything else. The Church of Noise counts quantity in negative instead of positive integers, and only celebrates two holidays. They correspond to eclipses.

0020160214: Markings in the meadow. Range finder. Explosives. Meat and the mercenary. The quaternary. The blood of a million years, pulsing in this and every landscape. Over the rise to another system. And across darkness, forbidding. A familiar pattern leaps in the fog and settles as deftly, in high resolution. The profligate moment arrives. A thud. Exhale.

0020160215: Out in the whiteness above the pass, beyond all traces of once liquefied steel and its machinations, and beyond the invisible wall keeping the world away from this country and defining its imperfect sphere of influence, there stands an ancient excess. The stone tower, interlocking, stacked with care and precision hurtles into the blank sky, pure, rough, heavy, and abstract. A single window opens from each of the five sides; a vertical slice near the top offers a vertiginous alternate horizon, with the eye at the center, but somehow incorrectly aligned. The night in binary: star-lit fullness and the emptiness of land. The sunrise, a curious energetic explosion from center to periphery, but altered by the two environments (sky and ground) in curious ways. Limited to this new slot-perspective, one dimensional, and obviously partial; the observer becomes privy to an almost choreographed rhythm of light and intense stillness, with various moments of motion. In meditation, one superimposes the arbitrary and the determined in time. Thoughts, whether summoned, recurring, accidental, or otherwise, are observed passing over and through the mind as wind, viscous across the plain and visible in the reactions of things outside itself. The singular inhabitant of this tower sleeps and prays steadily for many years to prepare for a full day spent in the tower. The preparation is simply an emptying, or reconstructing of self. The body and the landscape are the same. Some call the tower a drug. Others, a slippage or a rupture. The fact is, the tower doesn't really exist, save for those brief moments in a day spent so deep in another world that it is actually believed and recalled, and will someday be remembered so vividly that it counts as more a part of the physical universe than so many other, more distant, extreme places which we image, but never know with our minds.

0020160227: A code: Inertia. Infection. Incongruity. Superimposed memories and visions. A landscape of machines and a city of weeds. This fertile island breeds something strange, but magical. The light, yes. The grit, yes. But also the pulsing violence of a tectonic and microscopic history. Exposed strata of energy and action. The accretion of ways of thinking and their consequences. We gather intuitions in a continual harvest and supplant what isn't useful with what is terrible or new or

unusual, but the wave rushes on. Not in time, but acceleration. Not stillness or silence, just calm. Not antipodal, but ternary. Not Holocene, Quaternary. Jump up a level. Subsume. Mutate. Expand.

0020160305: The answer was never as simple as she'd hoped, and this time would be no exception. Rather than a clarifying, three-word explanation and accompanying diagram entered in the log and forgotten, the system she was uncovering operated in so many strange territories and decision methods that even the category-level descriptions and assumptions were incredibly dense, and difficult to comprehend. After listing every member of each organization, their various occupations and associations, and their locations, she began drawing links between them. A strange physical challenge, actually, without a construct. But she continued, the web quickly rich with many more connections than nodes. Limited verifiable information about actors, and the resultant confusion over why A would be interested in meeting with B at this or that place in Spain, or Africa, or Station-F was not only puzzling; this was madness. In a moment of weakness, she allowed herself to imagine an alternative to this manual insanity…but stopped quickly, even feigning surprise, just to try believing that she'd really decided against it. Passing the data to MIND was not only a non-option…it was forbidden, in this case, because of an ancient rule-set. Even if Sweeney hadn't given her explicit direction to the contrary, her own conscience wouldn't permit the use of a Super in this case. This was a special assignment, with special parameters and special compensation. The promotion to head Solver could even lead to Sweeney's job one day, but she feigned surprise again, noting (and not for the first time) that it would only be possible if He were unplugged. Not a common occurrence in any partition, these days, thanks to an ever-increasing awareness of bridge programs, whose nefarious reverberations in the Physic reach us, even here, at the quiet limits of the Drive.

0020160309: Writing until the battery goes out, then biking home. The point is: what do I want to do, and what do I want to say? I may produce 472 drawings, but what are the 3 that I want to show. I need to curate the few things I show others so I can get a…controlled response. The practice of architecture is often a double-life. On the one hand, I work for XYZ Architecture for 7-10 years, doing what I know how to do and getting the job done, not subject to the firm, nor subscribing to them, but simply working along side them. The real work is being done on the fringes, in the wings. The real work is the art that life is about. The real work happens in our own time after we've paid our bills. There is no compromise if you make everything work in tandem. We superimpose intentions and understanding. We just do on the side. The things continue. The things aren't anything more than the light which allows the shadow to persist. What do I want to say? What do I want to do? What are my interests? What am I investigating? What is the point? The thesis is mine to define. If this is about risk and control, than I should say that up front. I should communicate exactly what I'm being selfish about. I should make it clear exactly why and how I'm operating. The presentation is a curation. It is an editing of the self to make the statement powerful. Don't dilute by showing everything. Allow for power in the vague. But don't do nothing. Withhold. Keep secrets. Do the work, make the tests, but curate the statement. Power in absence. Don't shrink from the possibility that this is a unique moment in time and space. I have power. The means are an extension of the ends. What am I hoping to accomplish? I'm hoping to accomplish that which will best feed my future growth. This means engagement with all possibilities. This means accepting the unusual. Risk and control are two sides of the same coin. Two faces on the same neck. We look in all directions at once, but what do we really see? What is hidden? What do we choose to ignore? What can architecture say about risk and control? What can I, as a human, as a global citizen, say about the things that touch me? Why is it I look deeply into a site, and always see the same things? I see ecologies. I see systems. I see interactions. I see an overwhelming multitude of scales and speeds, understood as an infinitely complex and fine-grained map of the world. No matter how far in or out we zoom, it is always the same structure. The same system. The same two legs pumping the same two pedals. The same effort. The same action and reaction. The gravitational wave, the light wave, the tsunami. The surfer. We're all connected. We're all fragmented. How can these things coexist? What does the superimposition say? What does it do? How does it act in the world? I can't be all things. I can't know. If this is true, how do I move. If the essence of the issue isn't provable in this or any logical system, why pursue the truth at all? If grace is a choice, I don't want it. If grace is a gift, I don't feel it. Sometimes, I don't feel anything. And sometimes I feel it all, like a mass. Like a weight above and around me, like the atmosphere, like millions of them, pressing on all of me from every direction. In the grip of a greatness, of a solitude and a void, of an isolated infinity, no beginning, no friction. A limitless stream. A language of elevation, and its requisite database. What in the function prefigures the structure? How does the information structure determine its own content? What aren't we seeing? Why are we continually involved in the same rehearsal of production and consumption? Isn't there a newness? A freshness? A rebirth? Where does it come from? Why is it, only now, in talking about renewal, I suddenly think of hunger and thirst? I'm aware of my body. I feel my need. I feel my fingers. I know I'm here, and I'm sitting here with myself declaiming my inadequacy. Can't spell. Can't see color. I've been drinking, but I've been in communion with the universe. The vast unblinking nothing. The wondrous glory of an emptiness beyond comprehension. Literally beyond reach. There is an unobservable, and we have access to it, but this is limited, and these words, like the viscous binary hard drive storage is limited. It will die. These words will be read finally, and disappear. The quotation of a future that may never happen. The impulse of a drive which were born with but never execute. The timidity which surpasses all understanding, and the consequent weakness which we can't explain but feel constantly and relentlessly like a driving rain in the muddy field of all our past selves, buried under the heaviness of a thing we couldn't express, but tried majestically to through mere words. Everything in a glance. Eternity in a glass. The inversion never seems normal until we face it and cook it and eat it. What holds its tongue in the wings? What isn't she saying? Where is time if it isn't in the slow negation of a heat wave.

0020160412: New layers of sweat form as beads and films across his upper arms and certain places on his back, of which he becomes acutely aware when a soft, warm breeze yawns down the shoulders of the ridge and across the musty fields. A hazy sun beyond the nothing, as he's begun to call it, breaches yet another angular milestone and stretches, extended in the troposphere with neither schedule nor a conception of it. The blaze of past mornings might have lessened the intensity of this one, but the seemingly endless expulsion of fire and violence seeks no rest. The ache of the plow and spade echoes like an after image in this day, as so many others. But the ache is beginning to soften, thanks to one simple thought: this is the year of harvest. For thirteen summers, with the devotion of a saint, I've respected the rhythms of this place with no reward, save my own solitude. Is it really this I'm working for? I've actually come to long for the mystery of tasting a first-fruit. The first-born American agave spirit, torn from the bowels of some secret collective existence. Maturing and developing, as it always has, according to its own internal clock, and leaning into the heat, not away from it, according to its own internal preference. And are we not also wholly subject to those preferences? The investment of seven summers, now, has been to plant increasingly varied copies of the original four landraces of agave. These results will pan out with accelerating precision, like the start up of an immeasurably long

freight train with one humble steam engine; only after many years of documentation…on the paper we made ourselves from the first test harvests. Add documents to the archive. Literally. Hide them in the physical archive (just beyond the pendulum) whose indices we invented ourselves, whose traces are tabulated meticulously and incrementally in the seeds of each plant in the field, and whose body (whether inevitably, or not) we imagined into something living itself.

0020160417: The empty territory of all winged creatures and machines hovers, heavy and pure stillness, in majestic insouciance over the near-barren earth with infinite reach between the monstrous edges of the basin, hardly visible in the low light of the early winter evening. As I write, the shafts of this particular solar arc warm the walls, and the walls receive that warmth expectantly. They drink it like I have, also, in the transitional seasons when it was neither too humid, dry, windy, nor stale to sit with legs crossed in the dustbowl, back to the heat, and stare at the blurry edges of my shadow, writhing and inflected by the dust and ants and rocks. An indecent amount of time passes, interrogating and accepting these memories and acknowledging my fatigue, before I return to the pages of an old atlas. The moving edges of states, beliefs, and geologies cross in reflection of my pen, flashing across a heavy notebook, recording a passage for I don't know whom. I don't know the person that directs my academic endeavors, which I typically perform in the three hours before my stomach often calls for a final meal of each new sun's passage; but I think if we could meet, I would tell him the following: language does not guarantee access to thought, thought can be empty of language but usually isn't, and the combination of thought and language is most simply expressed in music.

0020160417: The ultimate result of this process of contribution, production, and extraction is not a final outcome. It can't be stated. It can't be operationalized. Not everything can. We don't know exactly what should or will be published, publicized; but we're certain that an offering will be made. Someday, even our strange constellation of archaic activity and technologically progressive application of knowledge might be considered effective. For now, we can only tell you that we're working, thinking, living. The secrets of the monastery are young, but buried deep in the mountain. Gable Mountain. We begin with a permanent bell tower, designed to last for ten thousand years, and to regulate and realign our bodies and their application to the land through its periodic singing with reference to a new rhythm, cadence, and frequency. Next, mobile dwellings allow multiple-night stays in different areas of the Hanford site for making soil samples, sampling groundwater, and meditating. These retreats lead to the selection of a site for agave cultivation. The basalt provides a more permanent building material for a one-thousand-year structure facilitating harvest, processing, cooking, fermentation, milling, distillation, aging, bottling, and distribution. Someday, this may offset the costs of our monastic operation. We have no way of knowing.

0020160419: When the clouds clear, take advantage. This statement can be literally and metaphorically mapped on to a staggering number of situations. Staggering. Infinite, perhaps, if that were something one could calculate or know. I'll zoom out, just for a moment, and take one of the larger views of…(I hesitate to name things I haven't created yet) what I've been up to. For one thing, I'm nervous about the future of the architectural profession, and consequently, my own future. There are many roots to this intuition (including a lack of diversity or Western white male dominance, loss of control, loss of agency, pervasive guilt, what is creativity worth, why do we spend so much time writing about and defending it, not enough risk, not focused enough on things that matter, what can it do, what is the right question to ask, etc.), but at the beginning of the Master's thesis process, I reacted pointedly to these fears. I wrote fictional vignettes trying to get at whatever there might be at the bottom of the architectural well. I read a lot of philosophy and magical realism, trying to construct a framework for an alternative approach to architecture. I looked at material formations on the fringes of architecture, out where engineers and scientists work, and whose experiments' needs take precedence over traditionally accepted architectural domains. I struggled with the term "Utilitarian Architecture" for some reason, and couldn't put my finger on why. It annoyed me that such a term could exist, and it made me question the existence of architecture outside of utility. But I finally figured I had realized that all space has architectural quality, and this quality is what we're after.

The "Architect" might as well be called "human," except that one happens to have a relatively broader and deeper knowledge of both what we've called architecture in the past, and where "Architects" find themselves working today, including but not limited to a facility with the tools, language, and structure of the profession. Some architects, perhaps, have a meta-knowledge, or an ability to jump out of the system and operate on it. The most well known architects, to use a sports metaphor, are coach and player at the same time. I can know my position on a (European or American) football team, how to move, how to handle the ball, etc. But I can also know about the team as a system. If I can understand how my teammates think, empathically and instantaneously, then I might be able to adjust my own performance to that of a larger, emergent whole. However, while there is a very clearly defined goal in football, there is no agreed upon goal in architecture. Among the possible set of goals: design spaces of work and rest, enhance beauty in the built environment, memorialize, affect policy, improve the environment, mitigate the building industry's negative effects, reverse climate change, help disadvantaged populations. Some might say that these are all viable aspirations. I might agree, except that functionally, some of them point us in very different directions, yielding antipodal foci that truly and decidedly fragment the profession. Some architects disagree with the type of thesis I'm working on, and some fully support it. Some might even think this paragraph is a misguided philosophical rambling that we can simply decide to bypass, picking up our laptops and moving rapidly into the real world of actually making architecture… My motivations for writing this paragraph are simply foundational to the way I see the world. And believe it or not, my deepest goal here is self-knowledge.

I hereby refuse not to write it.

Selfishly, I'm making some conceptual models and strange drawings, reinventing diagrams, continuing to develop a working method, and analyzing lots of ideas I'm curious about. But I'm also looking at the process itself. Some ways of getting under the hood of the architectural dilemmas I've mentioned above:

1. Is architecture (too) anthropocentric?
2. What could an architectural meta-language (T. Morton) be/do?
3. Is the wilderness really wild (Dirk van Weelden)?
4. What is the specifically generic (Kiel Moe) space of group ritual like?
5. What about the building detail creates moving, powerful qualities?
6. How is the function baked into structure for both potency and mutability (Kahn)?

0020160421: We're already up to something, writing the spec. We know that certain materials last longer than others. We know that certain formations and arrangements of components are more

durable and long-lived. We try to control these situations as well as possible, from the forefront, by writing strict guidelines regarding their application. So simultaneously, we're projecting a series of layers upon the project that include material transportation to the site, installation, opening day, regular building operation for some time span, and perhaps a sort of 30-60 year life-cycle analysis.

How would a 100- or 1,000-year specification read? It might discuss the recommended replacement and recycling phases of weaker parts, as well as the wear patterns of the relatively stable components. It might contain provisional statements, assuming the eventual failure of certain building details, and the best way to repair them. It might even have to acknowledge a fairly high risk in terms of unknown variables. There might be a lengthy section on catastrophic events, and the possibility of salvage and reuse for some, but not all materials.

The thought experiment itself might cause us to think about architecture in new ways. Systems of lighting, heating, ventilation, and energy might be reconceived in terms of their robustness, their longevity and resistance to decay. Or perhaps redesigned to more easily accommodate incremental improvement and replacement. We know water flows naturally from high to low points in a sufficiently unobstructed environment. Perhaps the water delivery system is simply an infrastructural hallway, touching all rooms, moving from high to low, and containing a generous, excessive space to allow for whatever sort of technological solution is deemed most sustainable/effective at each moment of revision and renewal.

(Spring I) BELL TOWER: The permanence of the Bell Tower is the vital first architectural instantiation of the Atomic Priesthood. The Bell Tower is an atemporal vessel, signal, symbol, retainer of ritual, tracing instrument, and immense investment. This, the most permanent act of the community aside from its creation, establishes a waypoint in the world from which all future knowledge can be obtained, and in which all knowledge can be archived. The Bell Tower is a literal well, archive, observatory (celestial, weather, etc.), shelter, and bell amplifier.

(Spring I) SHELTER: The Shelters are transient; sensually and materially ephemeral. A rite of passage for entry into the cult is to build a sleeping space and sleep there from one Spring until the next. This probation, in a way, yields a powerful shared experience rooted, not in the group, but in isolation. The combination of group ritual and individual development is embodied in this process, just as many initiate monks (including, for example, the Carthusians at the Le Grande Chartreuse monastery in France) begin as provisional members as they evaluate and are evaluated by the community. The architecture of an all-season, single-use shelter is one of minimum necessary. But unlike a tiny house, this is just a place to sleep. The rest of monastic life is enacted within the existing infrastructure of the community. This means that while there is a semi-sustained initiation of new members (one every few years or so, as needed to replenish aging monks), the technology may pass from one generation to the next in an evolution of tent-building skills that follows an unpredictable but colorful path as new waste materials from harvest and distillation become available, and as the site changes with climate change due to global warming, for example.

(Spring III) DORMITORY: After three years of soil evaluation, the second most permanent structure is added. Expected to be rebuilt every so often, the semi-seasonal Cloister, Balneary, and Dormitory facilitate the private lives of full monks. The more foundational, permanent aspects are the concern of this design, as well as one possible instantiation of the "clothed skeleton" with a contemporary architecture of soft austerity, semi-permanence, and function. The first instance Cloister will house the refectory as well. When the Distillery and Refectory are built, the second instance of the Cloister will simply have a Balneary, with old refectory converted to Dormitory.

(Spring XII) DISTILLERY: After 12 years of agave cultivation, when the oldest plants are ready to be harvested for roasting, the Distillery and Refectory will be built. The crossing of the production and consumption of food/beverage will offer a pleasant friction. The cycles of waste and harvest will be apparent, as bagasse and vinasse produced during the milling and distillation respectively are used to compost food scraps from the table.

(Spring XCVI) UNKNOWN: Unpredictable and unknowable (we're leaving Earth for Mars, we're all gone, things are generally the same, we're enslaved to the machines, etc.). The impulse to include this time scale is just to say that, while it would be nice to control the future of a building, design, or idea; we're ultimately at the mercy of forces outside of us. I'm offering these ideas as an interpretation of what I've learned about myself, what I've read, and what I've encountered. This is a way of dealing with a great responsibility we've created for ourselves toward our future selves. We're all complicit. We're all responsible. Maybe architecture could help communicate and embody that idea. That's what I think. Mic drop.

0020160510: Always moving, never complete, pulsing, thriving, breathing. Borrowed and quarried materials interrogate the orbit of their own context. Contents outlast their makers. Many say there is a glowing intensity in the magnetic mountain. An invisible striation. The sum of its forces is never apparent to the body, except for the body of that beast we call cloister, which we've never seen entirely (as if this were possible), but rather grasp briefly in its transience, just as fleeting as bread and wine in the stomach or wind and fire on the plain. The self-induced erosive force of neglect operates on the eldest members of this slow migration like a casual fire, catching and growing inevitably in time. But in its wake, the fire leaves fertility. We always lose something to gain something else. The consequent saplings, perfect for bolts, offer more green than the rest of the dust bowl. But somehow, their alien colors loom in dreams, uninvited and perhaps not entirely innocuous. Bred intoxication, present in the groundwater, added to the mind. Concepts and cosmos, rich with drugs in themselves, augmented or perhaps tempered by the fiery water, newly tapped and tested. We write about these experiences, too, from the youth of our nests. We know these too, after our time, must pass on. We participate in the renewal of the cloister, but the nests participate in the renewal of we monks. They see us come and go, and they come down from the heights shortly after our deaths to become closer to the ground from which they came. For a brief period, they survey and test altitude in a vertiginous horizontal orientation, before returning to a life of vertical cycling.

0020160515: Perhaps, in spite of the hopelessness involved in writing something nobody will read, the non-linear narrative is best in this case. Here we are, celebrating the first vintage wholly of this millennium (save the seeds, of course). A smooth 5014 from the once-wretched hills of the former Hanford Site. I am one of the only practicing English scholars – forgive the awkwardness. Now largely open to hikers and farmers, the Hanford Preserve is at once a place of beauty and terror. Acknowledging the remnants of what happened here involves a mind-bending journey through the strata of Gable Mountain, across the nation, beneath the ocean floor, and in among the affected

bloodlines of thousands of descendants, not only here in the frost, but across the all but vacant surface of the old West. It is possible that most people live in cities today, but it is impossible to know how many there are, or where exactly they are.

0020160525: The Priesthood has established a series of phases comprising the first epoch. Though marked by adaptability and a fluid sense of identity, there are several non-negotiable elements of the proposal that, if followed assiduously, will all but guarantee the longevity of such an order.

1.1.1. Geomagnetic North (the direction that the Northern pole of a magnet points, if allowed to rotate in three dimensions), which is actually the South pole with respect to magnetic charge, occurred about 15 degrees East of geodesic, or polar north in 2016. In the 21st century, Geomagnetic North was moving between 40 and 55 kilometers per year, effecting a 0.13 degree annual westward shift. As a result, accurate navigation by compass literally changes constantly. Though at a resolution low enough not to matter in the moment, the accretion of these changes over time, and their strange relationships to the magnetic properties of the Sun, gravity, Earth's rotation, and its inner molecular and metallic makeup create a sort of dizzying mathematic constellation. There are facts and fictions in the interpretation of an architectural concept through time, however, the fact underlying this entire narrative is that phenomena are rarely static, and cycles are rarely regular. Though many aspects of the visible universe change over time, we generally see those changes as constant. Winter comes at a certain time of year, and then Spring and Summer, followed by Autumn and another Winter. These cycles are, of course, caused by the tilt of the Earth with respect to the direction of solar radiation, and nearly unaffected (though somewhat counter-intuitively) by the Earth's proximity to the Sun, which varies by 5 million miles. The Earth is closest to the Sun just after the Winter solstice, which effects colder weather in the Northern hemisphere. However, at a time about 20,000 years in the future, the Earth will be closest to the Sun in the summer, and the precession of Earth's slightly elliptical orbit will have shifted through 180 degrees of its 360-degree cycle, lasting a total of 41,000 years. A purpose of this atomic priesthood is to use architecture to embody scalar shifts, making it easier for humans to guard dangerous nuclear waste that outlasts even their best attempts to imagine the immeasurable. In pursuit of that goal, the first 1,000 years follow the slightly chaotic adjustment of Geomagnetic North. Beyond that is essentially out of our control, however, we have made suggestions elsewhere as possible new alignments for future epochs.

1.2.1. The first fire of an epoch burns until morning and smolders in the dusty noon light. Both beautiful and dangerous, we affirm that we still struggle for control of this energetic release. Just three of us, to begin, have built mud huts in the imperfections of Gable Mountain. On the North face, half-buried, avoiding the wind and clutching the Earth's inertia. We cross the ridge daily to dig the well. We wonder how long the winch will last. Or the radio tower.

1.3.1. All native landraces of agave are initially represented on the Southern hillside in full solar exposure, as they prefer. Marked simply and planted diligently, we wait several years for the first harvests. Following fitness tests against known populations, the one or few hardiest species are isolated, archived, and encouraged to propagate. These first generations help define the flavor of spirits far into the future, and the work is done carefully with such knowledge.

1.4.1. It may seem excessive, but we're building 9 monoliths at once. The chances of occupying them all now are quite small, but we haven't yet tested the decay of exposed, cut basalt in this environment. With a frequency of one century, the full replacement cycle would be 900 years, with just shy of 27 cycles needed to reach plutonium's half-life. The beautiful asymmetry of these numbers gives us cerebral pleasure. We've hired stone-cutters, masons, and expert builders; unfortunately, not all of them have elected to stay in the community. We immensely enjoy visitors.

1.5.1. Living with mules is better than expected, but there are certainly downsides. The amazing thing is, they're working just as hard as I am, and reaping none of the intellectual rewards. But then again, I don't know that for sure. I once heard that a dog's happiness far exceeds the greatest human happiness, and its grief our deepest sorrows.

1.6.1. Tiring of the rituals, there are times that monks leave for retreats into cities, or other wildernesses. They always return refreshed, but missing something of the simplicity and rhythm of monastic life. Though largely dependent on the individual, there are communal practices that, having emerged and faded through these decades, simply help provide the context for a generative lifestyle. We eat together often, but not always. Some individuals' research takes them across the Hanford Preserve for weeks at a time, creating a phased schedule of common work and individual study. Others are here simply to enjoy the landscape in its severe beauty. Photographers, painters, writers, thinkers – each attempting to attend to an enveloping emptiness, so hard to find in modern urban life. But we find a way for everyone to participate. Watching fermentation or driving the mule. Building. Tearing down. Returning waste products to the Earth to feed other harvests. Making rope. Weaving fiber. The poetry of use and reuse here tests our patience at times, but offers an alternative lens for viewing human nature, responsibility, and guardianship of the planet. Some are skeptical, we're still plugged into the grid, and of course we still use computers.

3.1.1. The infrequent shifts in measurement resulted in an unpredictable, yet beautiful path, traced down and across the South face, ultimately continuing beyond the intentions of any short-sighted twenty thousand year plan. The plutonium vault was forgotten soon enough, but the initial reading of Geomagnetic North was not. The recording, just like basalt, of the Earth's magnetic field on inception always served as a waypoint, or a pivot in the minds of the priesthood. The angular shifts in plan never destroyed the usefulness of the monad, though at times the dimensions were changed to give better shade, or sun-facing thermal mass. The tweaks at both scales are less important, however, than the soul of a migration. The archival recording of each state of the priesthood in the DNA of the agave, somehow still extant after all this time, attests to the resilience of language and symbol. Witness an amazing dedication. Despite an evolving English language and gradually increasing odd provenance of computer language in everyday speech, the tactility of a simple, drone's-eye symbolic accounting of the migration in space, according to age and position in the landscape, served beautifully to give all generations access to the story. Eventually, the monks began memorizing these markings, and in the most outstanding cases, individuals were known to draw without reference, from start to finish, the lineage of the migration in its entirety. Etched into glass, traced out meticulously on handmade paper, or at least once scraped into the sand, these two hundred forty-one superimposed postures of the same transcendent entity were said to evoke simultaneous feelings of extreme cynicism, deep hope, and dizzying acrophobia.

3.1.2. In a sense, we're all nameless. That is the nature of our masterwork. We cross the landscape

so slowly that we can hardly point to any progress we've made, save that of generations before who set this clockwork into motion. They don't know me, but they trusted my resolve, as their forerunners trusted them. The pendulum swings imperceptibly, yet steadily, roughly east to west, every century. I was born off cycle, and therefore participated in the building of Lady Seventy-Seven. As a vessel, in the migratory sense, the home of this atomic priesthood never rests. We rebuild living spaces as we tire of them, our oldest dark stone walls accept wooden beams most easily, and our dining room is defined by the aura of a heavy oak table and its benches, smoothed by so many seasons of callous hands and splintered tableware. But the distance to the edge of the basin never really changes. A distance of twenty-four thousand years never shrinks. We knew that then, but we live it now. You can see it in the way we stand or point. But we still believe it is honorable to curate an infinity that may never arrive.

In a handwritten letter to the Department of Energy, (perhaps falsely) dated 2016, the architect writes:

Though we designers don't claim access to the future, we nonetheless refuse to renounce responsibility for the results of this experiment. Of course, the direction from relevant professional bodies must recommend denial, after no more than fifty years' time, to accept liability for circumstances which may lead to the failure and dismantling of the aforementioned site, monolithic structures, farmlands, relatively temporary life-supporting elements, or social formations.

The architect's primary and overarching task, in one view of the so-called building industry, is to expertly tailor a formation of material and energy to its primary, or initial phase of use. This use often endures no more than fifty years. However, this architect claims neither to have proposed something so ephemeral as a fifty-year sculpture, nor something so relatively permanent as a fifty thousand-year monument. As we know, the profession already masters one of these, and the other is seen as both taboo and monomaniacal. Neither, however, could be further from the truth. The "ambition" of this project, as outlined in other places in more detail, is unselfish. There is no reason that other thinkers, for example, shouldn't take this project many steps further, addressing aspects that we overlooked, and offering ideas for which we had neither suitable time to develop nor creativity to uncover. This project is merely the beginning of a suggestion; we've created a program, in the technological, algorithmic sense of the word, upon which others must build. The fantastic discovery we've made, however, after seeing the problem through this lens, is that the algorithm is also auto-aware and auto-fortifying. It renews itself. Its weaknesses are incorporated and celebrated. No matter its shortcomings upon departure, experienced thinkers, for whom our suggestions are simply guidance, must carry out the abstraction and one of its possible futures. Of course some of this guidance will seem outdated, even two or ten years from now. But that isn't reason not to make it. In fact, it is our hope that the Priesthood will continue writing guidance, as time…marches on. The refusal to prescribe, withholding of direction, and muting of risky guidance – these are some of the profession's biggest challenges. In a time where codes and regulations are obeyed as if sacred, the architectural imagination withers. The architect's mind thirsts for challenges, but is preoccupied with the integration of a multitude of opinions. She must distill dense requirements to their essential components for clear communication to those responsible for manifesting her intentions, in lieu of asking harder questions about the process itself.

Nobody is paying me to make this investigation. Perhaps nobody should. However, far more thought and action must address problems related to risk and control in architecture. The desire to control all aspects of a 24,000 year architectural project would have, of course, resulted in failure. The refusal to take risks, in both styles of representation and subject-matter, might have also resulted in failure. However, the prevailing thought – that architecture is a way of measuring the world – inspires me to forge on. Speaking of metallurgy, the blacksmith wasn't always aware of what was happening in the furnace. The first carbon plating was accidental. The alchemical production of hard and soft steel was haphazard at best, until someone started paying attention. Perhaps we need more room for mistakes and accidents.

This project grew out of a fascination with the Satsop cooling tower – both a sublime space of architectural beauty and a manifestation of economic horror. Due to bankruptcy, the adjacent nuclear reactor was never completed. The cooling tower itself, an engineering marvel and huge investment of taxpayer money, material, and energy; lay dormant. The area is used to shoot movies. The military and fire department hold training camps there. It is all but useless. We acted ambitiously, but due to a lack of control, are faced with a hyperbolic concrete tomb. In much the same way, the Hanford Site though promising control, turned quickly into an entity to be tamed, managed, and remediated. In either of these cases, what if we operated with an inverted model of risk and control? What if we allowed the public to visit the cooling tower, and reinforced it for interior rock climbing, recreation, and enjoyment? What if we gave up the illusion of "controlling" nuclear waste, and allowed an Atomic Priesthood to curate the property, warning visitors of the dangers but allowing them to set their own limits? Of course, there would be disasters and lawsuits. Yes, radioactivity is deadly and undetectable without proper sensors – perhaps this would be warning enough. But the Hanford Site is no wasteland, and the nonhuman, purely solar-powered ecological momentum of a shrub-steppe desert will not be erased. After all, there is something wonderful about a desert. To restrict access and limit litigious risk is to hobble the resilience of life itself. Policies will not erase nuclear waste. Utter disposal, like control, is an illusion.

When we consider the future in terms of geologic time at universal spatial scales, as the careful interrogation of architectural strangeness has led me to do, we realize at once that nothing is as simple as it seems. We must acknowledge both our powerlessness, but also our incredible potential. In some ways, architects have no control over what happens in the future. From the moment a thought is expressed, its translation into drawings, models, and objects is at the mercy of a host of possible accidents, misinterpretations, and existential risks. For that very reason, architects can feel freedom to focus intensely on the soul of a project, and its best expression. Many things will change. Governments, economies, energies, ecologies – these things are constantly moving and impossible to pin down. Perhaps architecture happens when designers make it possible for us to measure this change. In the Atomic Priesthood at Hanford Site, we identified the necessity of a social structure to support the curation and guardianship of waste, dependent on a long-view of responsibility and the translation of temporal scales from momentary daily experience to many thousands of years.

Despite what might be prevalent or fashionable in the discourse today, architecture is still about beauty and impermanence. If we're not struggling with both beauty and death, we're no longer human.

APPENDIX D – DREAMS

0020160526: 7:00 AM, transcript of a dream retold to voice memos (names redacted)

mm-hmm, ok, just to get it out
because this was one of the most profound dreams I've ever had
the date is something like the 26th of may 2016
and I've been working on my thesis for four weeks
no
a long time
anyway
(sung) angels looking for angels at the door, what you looking for, I don't know
this dream started with meeting with X and Y about a potential job
we speak Danish and English
and X was drawing her face with a pen
and she had a long beard
and she held up her drawing over her face while she drew
and she was drawing herself with a beard and eyes and hair
and she would hold it over her face and ask me if it looked like her
and I said its almost the hardest thing to do because I can't see your face
so I took it from her and then looked at both her face and the drawing at once
and I told her that her beard was too big
and I also told her that her eyebr- no that her forehead was a little too small
and that otherwise it was it was very good
which actually it was not
and then we're at her office which is like a jetson's set
and Y was not coming to the meeting
and she called him and he said, oh what time is the meeting and she'd been waiting all day and she said
I don't know can it be in like two minutes
and then they set a time for four, and then we were gonna wait
and then I transported to another place

and the other place was this desert
which was a mix between another skiing dream wilderness I had had before
and also just the desert of Texas
sort of amazing
um, ok, well it was just a wild
it was a barren desert landscape
and at one point I walked over near a firing range
and I look over and it said government firing range no looking, no trespassing
and there were three guys firing their weapons
and one looked over at me and stared at me
and I looked at him, then I looked away at kept walking
trying to obey the no staring sign
and then he said something very official sounding like
am I detecting a smirk
and I said uh
I didn't say anything I kept walking
and then another guy was approaching me on the road another official
and he said something very official sounding, but like
turn 45 degrees and walk towards the sign now unless you want to get shot
or something, and so I did that because I was scared
I walked towards the sign
and then I became privy to a story, because I was about to be under arrest or something
for just smirking about the firing range
but then I became involved in this story about a lady who had rented a library book
from this special library and the rental period was one hundred years
and the crazy official police force of this town was going after this woman for having a late library book
and they were gonna get her they were gonna repossess her things they were gonna really get her or her family
so anyway ok, there was this little stand like a kiosk near where I walked over to the sign and
and I began watching this replay in the kiosk as if I were watching a movie
and it was being narrated in a strange rhyming way
and it was also was being shown to me as a video
and it was clear that they were actors with like props, and posters that a child had made
and one of the things was that this library book was due
and the daughter, ok, was a doctor and she had a giant watch
and the watch was a super nice watch
and I guess the officials wanted to take that in return for the lost library book
which was a hundred years, it was checked out for a hundred years but that was the due date
and this watch had the name written on it, but it was bigger than the lady that was wearing it
and it had the name of the watch, and then all of the, in cursive under the name of the watch
all of the great things that the watch was like
this watch is huge
it doesn't fit on a persons wrist
it is so nice that it is so big that it doesn't fit
and it was strange, like ok, and there was someone with her
but then we zoomed out from that, and began reading a book about this landscape
and the book was online so it could be animated, ok because the original book was even longer somehow
but the way that you read the book is that you travel across the landscape which is actually, as it turns out, the thickness of the books pages, of the books pages themselves
so you're like walking around and I don't know the landscape of the edges of the paper
and when I zoomed out for a second I realized it was just like papers on end piled up for miles
and me walking across the edges of them, and then peeking down in the crack to read
like a certain part of the book or other parts
so that's where I get this song
there were two things I tried to google when I woke up:
angels at your door what you looking for I don't know
and the other one was something about chicken crudité
but it was basically just the craziest rhyming nonsense and just lists of crazy things like different nicknames

oh and there was a great one about uh, there was a great it was basically just a hundreds of pages of jibberish phrases which made up a poem, and underneath each phrase which rhymed with the ones around it as in a poem, underneath each word, it was a bunch of words, underneath each word was a translation of that word and it would be like, one word would stand for I don't know for example like a tractor sitting rusting in the field at sunset on your birthday with a fried egg like sitting in a box on the seat of the tractor and the box is on fire, that would be what the word meant
but it was just a nonsense word like bergageder, but there were so many and they were all translated
and ok and then flipping through the book I was also seeing some amazing
oh at the beginning it said, this is a map of whatever town whatever town I was in
which I guess was like the map of the edges of the books which was created
ok when you read one of the pages of the books, it had a map of the edges-of-the-books town
ok of which the edge of that page was one of the ones making up the landscape
anyway
there was this herringbone pattern and the title of the book was whatever it was
and then the subtitle was: this map is made up of a beautiful herringbone to please your eye and calm your mind or your senses or whatever, and then the herringbones started to move
and they formed into different topographies over time, kind of like a gif
and it said it basically it formed into like ten different topographies and all of these steps in between
and then it zoomed out for a second even more so I could see all the edges of the pages
and it had a disclaimer which was being read to me in my brain
and it said it said that all of the edges of the pages with flags were the ones which had been added on the internet using technology so that you could watch the animations
but that didn't make sense to me because the animations would have been on a single page whereas in the book, they would have been on many pages if there was a page for each frame
so perhaps all of the flagged pages were pages that had been removed in the online version because they became redundant when you could have a gif instead of many different frames
and so what I realized was that they had to get all these pages from somewhere
like
there were more pages
like the pages were the landscape, the world was made up of pages
but where was all the crap that was on the pages
and it occurred to me that it must be in warehouses somewhere
or it must have been in warehouses
because there was just so
I dunno ok so I went on a journey to find the warehouses where the kept all the stuff in the books or where they found it all, yeah where they found it all because
the book was basically a recording of what was on the landscape on the edges of the books
and because I was so tiny, I mean I could see the flags that were marking the pages that had been removed, they were as big as houses, which meant that the contents of the book far exceeded the landscape surface of the edges of the pages, obviously, mathematical fact
so I proceeded to the nearest warehouse where I went on a search for the original content of the book
and I walked by a few warehouses, tapping on the wall with my flashlight and saw one that said danger on the outside and I went in
well first I had to open an elaborate door, lock system and I walked
I went in and it was all dark and I heard some noises and I turned on my flashlight and there were just a hundred cats down at the other end, like, and they all looked the same
they were brown and black with little glowing eyes because my flashlight was shined at them
and my flashlight was making me mad because my glasses made it so that the end of the spotlight was always to the upper right, even if I was shining it in a different direction and all of these cats were just looking at me and they were super far away at the other end so they weren't near me but what it said on the outside of the barn was like poems from x y z place and I was like, what is this
oh it's the empty warehouse where they took the poem and all the stuff that made the poem and they made it into a book page, ok
and then there were rats, also
and when I walked in a little ways it smelled like poop and and rat and it was just a totally empty barn with a dirt floor and it was painted bright blue and red on the outside like a carnival color and I turned around and shined the flashlight down and there were like 17 giant rats on the near wall close to me
and they starting squeaking and screaming and they all ran outside and then the cats ran outside like through little cracks in the wall
and then I ran outside, and I really didn't want to step on a rat
but I ran out like kind of dancing and then I had this thought occurred to me like
what would the officials do they wouldn't dance around
they would just walk like whether or not they stepped on a rat
they would just walk like cowboys

and then I think at some point I was looking at other pages of the book
and that's where I remembered the chicken thing and the angel at your door song
and that's what I tried to google when I woke up
but of course I'm not gonna find that, I mean what
I guess I just made it up all in my mind, but some of the pages of the book that I read were just
ah, so amazing
I don't know what they said, I can't remember all the jibberish words or all the amazing definitions
but I remember reading some of the words and just not knowing like not knowing them or where they came from and having a distinct feeling like this is some kind of rural English that's real, that I don't know, but it was believable to my mind
it was so beautiful
just being there on the edge of the pages, of the pages on end, it was amazing

what does it mean when you blow your own mind
when your mind
when when you're inside your own mind and then you, it blows your own mind

I think I had too much ice cream before bed

APPENDIX E – DOCUMENTATION

Reading/Viewing List.

Interpretation of *Great Fiery Weapon, Chemistry, Hyperloop, Yucca Mountain*.

Models exploring stability, density, mass.

READING LIST

Gaston Bachelard	*The Philosophy of No*
Georges Bataille	*The Accursed Share*
Jean Baudrillard	*The Perfect Crime*
Nick Bostrom	*Superintelligence: Paths, Dangers, Strategies*
Jorge Luis Borges	*Labyrinths; Ficciones; The Aleph and Other Stories*
Dino Buzzati	*The Tartar Steppe*
Italo Calvino	*Invisible Cities*
Douglas Darden	*Condemned Building*
Gilles Deleuze, Félix Guattari	*A Thousand Plateaus: Capitalism and Schizophrenia*
Gilles Deleuze	*Postscript on Societies of Control*
Philip K. Dick	*Do Androids Dream of Electric Sheep*
Keller Easterling	*Extrastatecraft: The Power of Infrastructure Space*
William Gibson	*Neuromancer*
David Gissen	*Subnature*
Frank Herbert	*Dune*
Douglas Hofstadter	*Metamagical Themas; I Am a Strange Loop; Surfaces and Essences*
Alejandro Jodorowsky, Jean Giraud	*L'Incal*
Lewis Tsurumaki Lewis	*Opportunistic Architecture*
R. Duncan Luce, Howard Raiffa	*Games and Decisions: Introduction and Critical Survey*
Geoff Manaugh	*BLDGBLOG*
Cormac McCarthy	*Blood Meridian or The Evening Redness in the West*
Kiel Moe	*Convergence; Insulating Modernism*
Moebius	*The Gardens of Aedena*
Alan Moore	*Watchmen*
Robert Morris	*Notes on Sculpture*
Timothy Morton	*Hyperobjects*
Mark A. Peterson	*Galileo's Discovery of Scaling Laws*
Thomas Sebeok	*I Think I Am A Verb*
Robert Smithson	*The Collected Writings*
Robert Smithson, Jack Flam	*Robert Smithson: The Collected Writings*
Voltaire	*Micromegas*
Lebbeus Woods	*Lebbeus Woods: Experimental Architecture; System Wein*

VIEWING LIST

Edward Burtynsky	*Manufactured Landscapes; Watermark*
James Ward Byrkit	*Coherence*
Terry Gilliam	*The Zero Theorem*
Philip Gröning	*Into Great Silence*
Akira Kurosawa	*The Men Who Tread on the Tiger's Tail*
Michael Madsen	*Into Eternity*

GREAT: Adjective. Literally, the size or high quality of a thing. A symbol of excess or surpassing goodness. Out of the ordinary. Atypical. Anomalous. In a moment of frustration, often sarcastic, as in: "Great (I really wish this hadn't happened)." A surrender, or throwing up of the hands, whether in anger of humility. Greatness causes us to buckle. We cry at funerals – a life condensed into a moment of great power. We smile at vistas – great expanse of nature. Vastness. Depth. Height. Beauty. Normally positive, but we inflect greatness with evil, and darkness. A great evil, a force of darkness came over the land.

FIERY: Adjective. Of fire. Of beginnings and origin. Of both danger and sustenance. The power of the visiting sun. A beast from a distant but familiar species come to dwell with us. The incredible first steak – and all following steaks that came after. And its connection with those carcasses and their decomposition into carbon-rich expanses of fuel which burn without end in some parts of the world, and the countless other places where they burn with incredible control, tiny moments of chaos zooming around us and beneath us and around us.

WEAPON: Noun. An implement or tool of destruction. The history of weapons: fist, rock, stick, longer stick, sharp stick, sword, longer sword, flying stick, flying stick, flying sword, flying fire. Place as much distance a possible between one and one's enemies. Abstractly complex. "There's no need to fear or hope, but only to look for new weapons." I'm afraid of weapons, but they're complicated. I'm also glad to know how to use a few different kinds. Not sure why, except that they contain a force disproportionate with their appearance. Something great contained or dwelling in something of small stature.

CHEMISTRY: Noun. Literal study of chemical systems and interactions at the molecular scale, among others. Or the interaction between two or more systems. Of the interaction between anything. Includes practices of making chemicals and chemical compounds or assemblies into tools for use in different situations (cleaning, catalyzing, exciting, agitating, etc., all applicable to both substances and humans). Deals with specific and well-defined / experimentally-defined but often misused terminology specific, well-defined, experimentally-defined, element, molecule, mixture, compound, substance, dilution, concentration, burn, melt, vaporize. Can describe an abstract notion which results from the interaction between systems.

HYPERLOOP: Noun. Visionary proposal, contest, and mode of transportation of futurist Elon Musk, with a crowd-sourced approach to design, personal funding, with the ambitious goal of taking people places safely, efficiently, and sustainably…at the speed of sound. Condenses space. The human and the howl. Imagine seeing it go by. Inaccessible. Movie preview of alien flyovers. Farmers standing in awe, and perhaps disappointment. We're moving towards infinite and unknowable speed. Access. If it moves people, can it also move resources? How does this change the face and future of infrastructure? Will the suburbs expand immeasurably into rural America until we all own our equal fraction of the landscape, and we travel equally East and West

YUCCA MOUNTAIN: Noun. Visionary proposal, site, and waste storage concept of the US Government, with a contracted design standard and highly researched and theoretical approach to the safe long-term storage of the byproducts and products of nuclear weapons production and nuclear power, whose properties mean that they will remain dangerous to human health for nearly ten thousand years. Deep underground, controlled, secure, remote. Issues of communication into the future. How do we make sure that the place remains well-understood for such a long time? Immense time scales. Half-life. Properties, consequences, decisions. Cache. Ooze.

Great fiery weapon (TSA RA) in the Tibetan Buddhist Mo, carries the following subtexts:

GREAT FIERY WEAPON (TSA RA) in the Mo, carries the following subtexts:
TSA: North, violence, air and earth, body, messages, airs of the body, breath
RA: West, power, fire, eye, form, heart, desires of the mind, voice, speech
TSA / RA: share insight, wisdom, violence, waning moon
Also, Sword of Flames (power and influence inherent in force of fire…declaring love, taking right action, and moving through blockages)
Sign: Defeat the enemy, subdue Mara (http://www.fracturedparadise.com/ds/mo/)
Mara: demon who tempted Guatama Buddha by trying to seduce him with his daughters, personifies unwholesome impulses, unskillfulness, makes mundane things seems alluring, the negative seem positive
Mare (incubus, succubus, nightmare)
Marzanna (death, winter, nightmares)
Mors/Thanatos (death, Mars, Pluto, Orcus)
Prediction: Subdue all others by being endowed
Intentions: Being victorious over every direction leads to success
GREAT
Remarkable in magnitude, degree, effectiveness, duration, size
Of an extent, amount, or intensity considerably above normal or average
Considerable, substantial, eminent, prominent
Infamy
FIRE
The rapid oxidation of a material in the exothermic chemical process of combustion, releasing heat, light, and various reaction products
Conflagration, blaze, wildfire, bonfire, arson
Used to cook, heat, light, signal, propel
Fire regime (ecology, frequency pattern intensity of natural fires in an area)
Fossil record of fire (first fire on record 470 M years ago, accumulation of O2 in atmosphere allowed for natural wildfires
Link between temperature and color (black-body radiation)
Strong links to chemistry and thermodynamics
Early man, torture/execution, controlled fire (ag), warfare
Notable fires: Library of Alexandria, Rome, Lubeck, Copenhagen, Japan/San Francisco (earthquakes), Hiroshima/Nagasaki
Elemental, mythical, life-force, metaphor for power, knowledge, etc.
WEAPON
Tool for doing harm
Nuclear weapons, mutually assured destruction, Nash equilibrium, nuclear holocaust/apocalypse, Doomsday Clock, Clock of the Long Now
CHEMISTRY

Branch of physical science that studies the composition, structure, properties, and change of matter
The central science (bridges physics, geology, biology)
Comes from the word ALCHEMY which was an earlier set of practices that encompassed elements of chemistry, metallurgy, philosophy, astrology, astronomy, mysticism, and medicine
Changes in definition over time: from "the material principles of mixed bodies"…to "the study of matter and the changes it undergoes"
Divisions of UW chemistry department: Analytical, Biological, Catalysis/Synthesis, Inorganic, Materials Polymers Nano-science, Organic, Physical, Theoretical
HYPERLOOP
Elon Musk's idea shared July 2012, but open-sourced
Ideal for cities within 200 miles of each other, too close for airplane travel to be efficient, since most of the trip is spent ascending or descending
Design competition to invent/flesh out the technology
Several independent "Hyperloop" firms building prototypes
San Francisco to LA in 35 minutes, projected to be operational around 2020
Will transport both people and cargo at the speed of sound in pressurized capsules through an elevated, low-pressure tube, powered by PVs on the roof
Theorized to revolutionize the travel/transportation, but according to Musk, won't replace air travel between more distant places
Questioned on passenger comfort and safety, budgetary issues, feasibility
YUCCA MOUNTAIN NUCLEAR WASTE DISPOSAL
Amended 1982 Nuclear Waste Policy Act in 1987 to designate Yucca Mountain, Nevada as the only permanent repository for nuclear waste in America…approved by Bush Adm in 2002, but rejected in 2010 by Obama Adm, leaving US non-govt entities (utilities) without a place to dispose of (hide) nuclear waste…US Govt uses WIPP in New Mexico
Many power plants in the US use above ground dry cask storage, which may only last 30-100 years
One of the most geologically studied places in the world, by 2008 US had spent $9 B, tunnel boring machine cost $13 M, sits dormant on site today
Sacred land for the Western Shoshone and Southern Paiute people
Potential replacement: salt domes or salt mines
Schact Asse II, former salt mine used as deep geological repository for nuclear waste in Germany
Onkalo, Finland (Into Eternity)

GREAT FIERY WEAPON CHEMISTRY HYPERLOOP MOUNTAIN
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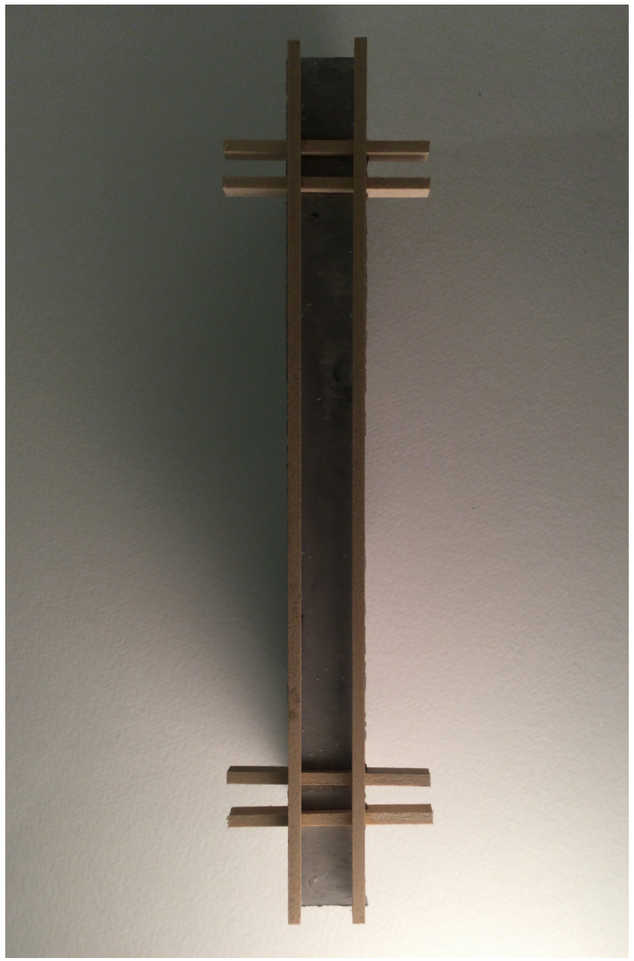
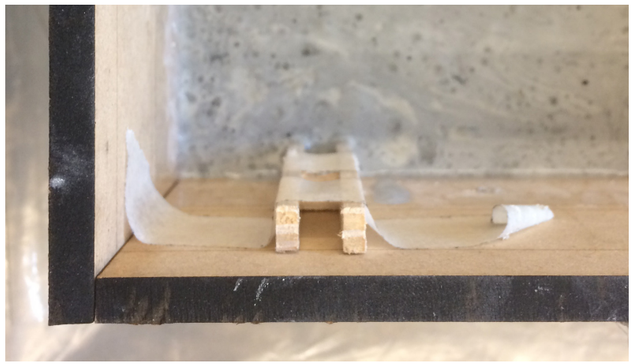
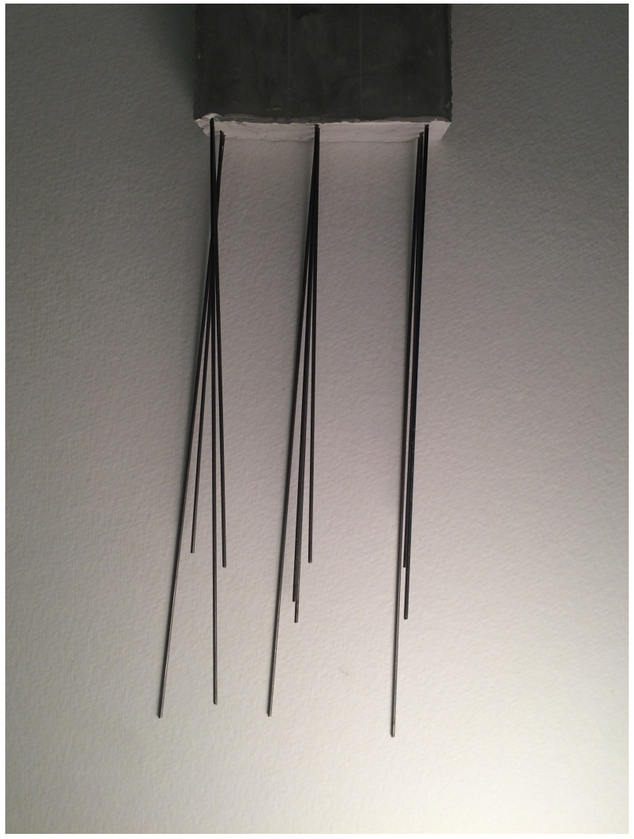
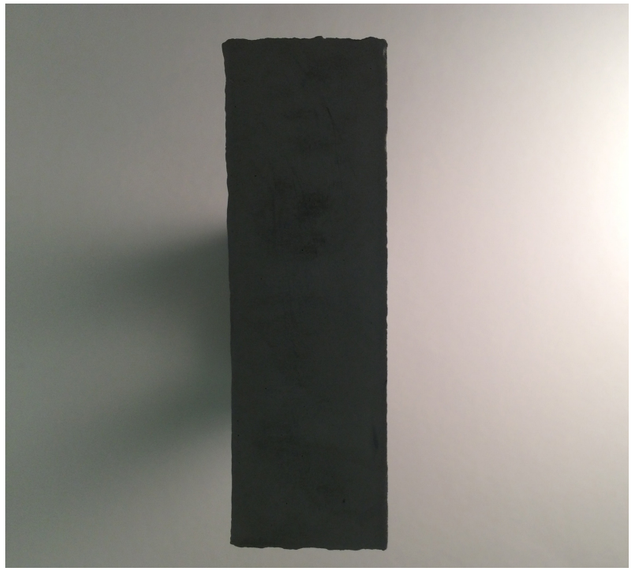
POTENTIAL INSTRUMENT DEEPLY ALCHEMICAL TRANSLATION AGGREGATOR
PROBABLE INSTRUMENT: DEEPLY AGGREGATED TRANSLATION ALCHEMIST
PROGRAMMABLE INSTRUMENT: DEEPLY AGGREGATED TRANSLATION ALCHEMIST
PI: DATA

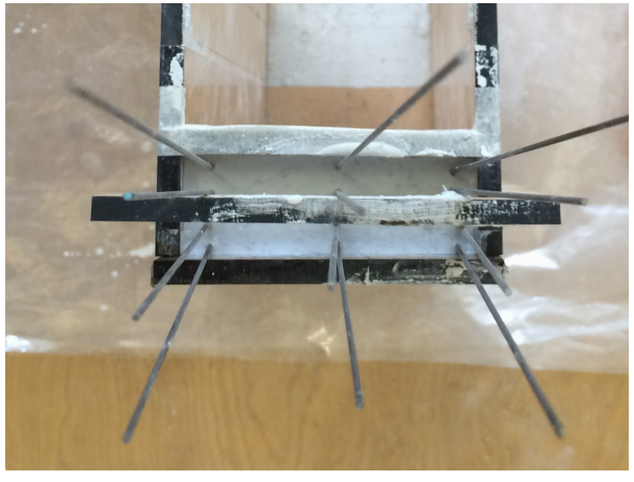
GREAT FIERY WEAPON…CHEMISTRY…HYPERLOOP…YUCCA MOUNTAIN

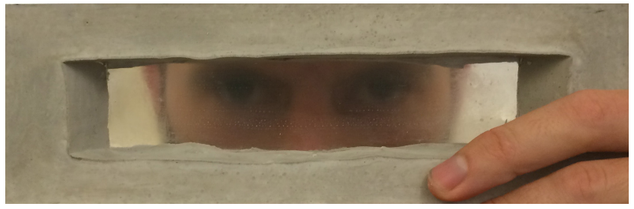












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