Time, and the Ecological Futures of Everyday Living

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Abstract

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Between entering grad school in a new country and starting a new job, I found it difficult to continue the low-impact lifestyle I had been used to back home. Amplified pressure to use my time economically made it more challenging to practice held values and beliefs to minimize waste, seek out ethical products, and learn ways to live locally within seasonal rhythms. In the seemingly unstoppable stream of globalisation, industrialisation, modernisation, and urbanisation, it feels inconceivable to imagine how to live slowly with less; less artifacts, less conveniently, less productively, and less efficiently, in the pursuit of care and empathy with other-than-humans and our shared habitat. Quantified and synced by atomic clocks, phone screens, scheduling calendars, and unified time zones around the prime meridian, immerse us in a quantified, universalized, global, linear, progressive flow of time, whose pervasiveness can blind us to the ways our lives are structured around it, the values it is built upon, and the priorities it sets for economies, governments, societies, and individuals alike.

Acknowledging time as a given frame of the world, this thesis seeks to explore the complex ways time shapes everyday living conditions in the hopes that other conceptions and awareness of time might open us up to other possibilities for more ecological ways of relating to and living in our world. Through exploring, tracing, and defamiliarizing time, this research attempts to better understand the simplified, automatic, and economically measured interactions with time that might be keeping us from living more ecologically value-driven and relational interpretations of time. Exploring a mix of immersion in different practices, making to reflect, visualizing to communicate, questioning, and navigating the gaps of understanding, this project of time seeks to reveal and defamiliarize our taken-for-granted notions of time.

Keywords
Time, Modernity, Traditional Knowledge, Exploratory Design, Ecological Perspective, Diagramming

Acknowledgements

This exploratory project would not have arrived where it sits today without the time of others generously offered to me over the past two years.

Thank you to the indigenous communities of the Səlilw̓ətaɬ, Skwxwú7mesh, and xʷməθkwəy̓əm, for the teachings I encountered as a newcomer to their lands. The stories and wisdom shared with me were a life-altering experience that opened a deep, reflective space in my way of being, helping me to learn and unlearn what I know and do not know about the world.

Thank you, Laura Kozak, Connie Watts, Louise St. Pierre, Bonne Zabolotney, Sophie Gaur, and the many other faculty members, friends, and colleagues of the Emily Carr community who were part of the inspiring environment. You offered me a safe space to think, practice, and behave with curiosity as a creative practitioner. The conversations and contemplations we held together pushed the boundaries of the limit I unconsciously set.

Thank you to my supervisor Craig Badke. You walked along this journey of researching time shoulder to shoulder with me, shining a bright light to navigate the pathway together when it felt like I was sometimes lost in darkness. Your nudges, reasonings, patience and support helped me believe in this work and find its voice, place, and meaning.

Lastly, thank you to my parents 은희채, 김순애, and partner, Gleb. Without your unconditional love and encouragement, I would not be where I am today.

I send blessings to all the people and other beings who have sustained the health of my body and mind to complete this work.

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Why Time?

Research context and framing

Why Time?

Abstract, quantified time—clock-time—has facilitated the functioning of a globalised economy in which "time is money" reducing work to measurable output, while disrupting and displacing nonmodern temporalities (Willis, 2020, 74).

Anne-Marie Willis, Design in Crisis, 2020

I dream about everyday living being favourable to planet Earth and its various ecosystems, instead of being harmful. I decide to choose the word *dream* because the pace, expense, and demands of contemporary urban living and working conditions can make it difficult to make ethical and ecological choices or even to see our individual efforts as having a significant impact. For a number of years, I have been actively practicing zero-waste living advocacy, but recently I have increasingly found it difficult to actively participate in a low-impact lifestyle due to what Laura Giurge refers to as *time poverty*, a constant feeling that I have "too many things to do but not enough time to do them" (Giurge et al., 2020, 2).

Juggling work and study, the pressure to use my time economically, often impedes me from acting on my values and beliefs to minimize waste, reuse, or mend items, seek out ethical products, and learn ways of living locally within seasonal rhythms. My choices around daily activities and mundane consumption now consciously calculate convenience, productivity, and efficiency to save time. As a working graduate student living in Vancouver, I experience a new pace of time, often catching myself being lost in decisions between old and new habits. This self-reflection pulls me into an uncomfortable collision between the efforts of ethical living practices, the demands of school deadlines, and the capitalistic structures of time of employment.

In *Designing of Time,* Willis emphasizes how time is quantified and measured as a resource, just like money. She offers a perspective on how the way we perceive and conceptualize time through "western, Christian, capitalistic civilizational matrices" plays a role in the anthropogenic climate crisis we find ourselves in (Willis, 2020, 82). How do these economically measurable perceptions of time that we are immersed in constrain us from accommodating ethical participation in everyday life?

Numerous questions follow, inviting me to explore the inconspicuous space of time further.

- *Does immersion within a linear, technologically mediated, anthropocentric, numerically divided, and quantified perception of time, such as minutes, hours, days, and weeks, blind us from seeing the ways it shapes our concerns and actions and its ecological and social impacts?*

- *What values and priorities does our current relationship with time reinforce or perpetuate?*

- *How might different understandings and experiences of time allow us to perceive and act differently in our world?*

- *Could a different attunement to time, as experienced by other creatures and cultures, help us conceive more ethical futures not only for ourselves, but for all beings?*

This thesis explores how different perceptions of time shape us in the hopes that other conceptions and awareness of time might open us up to other possibilities for more ecological ways of relating to and living in our world. Time is an essential equation that shapes many of our day-to-day decisions about what we do and how we do them, but the ubiquity of the structures of time we are immersed in can act as a kind of filter, such that we do not always notice their influence. In what philosopher of technology Andrew Feenberg describes as *the paradox of the obvious,* that which is most familiar in our lives often becomes

almost invisible. As an example, he questions whether fish know that they are wet, "...I may be wrong about fish, but I suspect that the last thing they think about is the medium of their existence..." (Feenberg, 2010, 6).

Acknowledging time as a given frame of the world, I seek to bring this familiar element of life—like water to fish—into a centre of questioning. The work that follows represents a journey that hopes to defamiliarize the constructs of time we operate in, but do not always consciously perceive or acknowledge. Observing time as an essential element that structures one's life in large and small ways, I embark on a journey to explore the complex ways time shapes everyday living conditions, to see the behavioural patterns different conceptions of time co-shape and explore the alternate value sets embedded in them.

Through the acts of *exploring, tracing, and defamiliarization,* this research attempts to reveal how our values, priorities, and ways of living are deeply tied to our relationship with time, and what the implications of that relationship are for enacting more ecologically favourable ways of living.

Exploring

The sociologist and methodologist Robert Stebbins, states that *exploratory research* is about situating oneself purposely in a place, unsettling and questioning what one knows again and again (Stebbins, 2001). I put exploration as the primary method of this research, following curiosity to investigate and contrast different experiences of time. Through deliberately looking around and exploring the social experience of time, I allow myself to navigate and tumble into the malleable space of temporality, seeking out the hiddens within our relationship with time and their impact on ecological living.

Tracing

Carl DiSalvo, who teaches and writes on design thinking, theory, and methods, articulates *tracing* as one of the designerly means to the construction of publics—the public as an entity that comes into being through issues relating to our social world (DiSalvo, 2009). He advocates tracing as a tactic, as it acts to expose, follow, and record the hidden beliefs, discourse, and movements of an idea (2009). Defining tracing as the form of designers' practice "to detail and communicate, and to make known, the network(s) of materials, actions, concepts, and values that shape and frame an issue over time," he recognizes communication design as the most immediate field of practice to locate the tactic of tracing (DiSalvo, 2009, 55). Using tracing as a tool to seek the footprints of time, I mark and evidence the constructs of temporality that affect our being in the world and attempt to engage others through discussions of shifting perspectives of time.

Defamiliarization

In *Art as Technique,* Victor Shklovsky, a leading figure of Russian literary criticism, claims that art aims to deliver the sensations of objects as if they are observed for the first time, not what they are already known as (Newton, 1997). Following his description of *defamiliarization* as the technique which creates new perceptions, I recognize the power of defamiliarizing in researching time, a presence so familiar it becomes an unquestioned force in our lives. Using defamiliarization to research different experiences of time, I seek to become witness to time's unseen influence with a fresh pair of eyes.

Time Explorations

Design practice and outcomes

The Experience of Exploring Time

The object is in front of us and we know about it, but we do not see it—hence we cannot say anything significant about it (*Shklovsky via Newton, 1997, 4*).

Victor Shklovsky, Art as Technique, 1917.

How does one track presences and absences, latencies or anomalies across assemblages that may cohere through other-than-human rhythms and scales, as is the case perhaps with disappearing wetlands? Importantly, how does one decenter modern systems for reckoning with time (e.g., Gregorian calendars, digital clocks, historical timelines) as just a few among many ways that we make, socialize, and write about continuity and change? (*Gan, 2021, 106*).

Elaine Gan, Experimenting with Ethnography, 2021.

This body of work envelops stories and visuals of human and other-than-human time perceptions that have become obscured, hidden, or under-acknowledged in contemporary urban life. Exploring a mix of immersion in different practices, making to reflect, visualizing to communicate, questioning, and navigating the gaps of understanding, I seek to reveal and defamiliarize our taken-for-granted notions of time. I collect evidence of its' fluidity to escape the linear, quantified, modernist, capitalist, and colonialist perceptions of temporality. Tracing time becomes the wheel of my experimental thinking to familiarize myself with alternative ways of everyday living, in search of the barriers and opportunities in time that might enable more ecologically responsible ways of living and being.

Hidden in the complex and overlapping layers of time are the values and desires of people, societies, nations, and the cultures that pursued them, or had them imposed upon them by others. Peeling apart layers of time and its multiple touch points, I will explore the traditional indigenous knowledge of my home country, South Korea, and the

uncomfortable disturbances of western framed modernity. The act of exploring time opens deep reflective space on my design practice, heritage, and responsibility as a citizen of Earth.

In order to open up the possibilities of perceiving time differently, I defamiliarize the subject, relocate and shift it out of its common associations. Through actively defamiliarizing time and shining it under a conscious spotlight, I attempt to better understand the simplified, automatic, and economically measured interactions with time that might be keeping us from living more ecologically value-driven and relational interpretations of time. Time shapes us, but we also shape time. Time is living and changing. Exploring, tracing, and defamiliarizing time create curiosity and opportunities to imagine beyond what is familiar.

Time Explorations *Chapter 1.*

Time Journaling

Urban, Semester Time
Backcountry Camping, Break Time

Figure 1.

The records of when and how frequently I checked the time each day for one week.

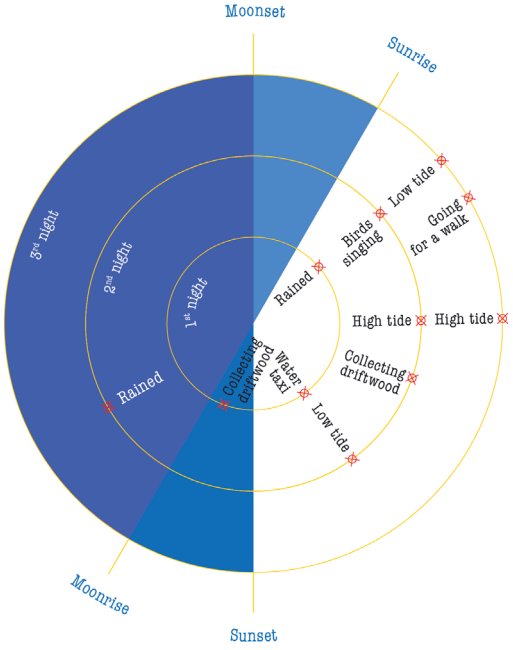


Figure 2.

The records of my time perception each day during the camping.

Urban, Semester Time

Clock time is a local measure of change, neither absolute nor universal. Nevertheless, clock time is ultimately what rules our lives: it not only tells us when to rise, work, and sleep, but, because the body itself is a clock, clock time governs when we grow old and expire (*Buonomano, 2018, 15*).

Dean Buonomano, Your Brain is a Time Machine. 2018

When my schedule is filled with commitments of everyday duties and obligations, arithmetically measured time appears to move fast, and feels slippery, unable to be grasped no matter how often I check the time. The mundane behaviour of engaging with clock time is unconscious, however, I sense the constant urge to know the numerical report of time to make informed decisions while carrying out everyday performances. My mind drifts off to ponder this seemingly senseless act of checking the time. I contemplate ways to break the habitual impulse of wanting to know the time throughout the day and attune myself to this repetitive pattern of behaviour. I decide to write a time journal to source primary information. Whenever I check the time over seven days, I write down when, why, and what feelings arise. I cover little corners of the screens on my electric devices to avoid looking at the time by accident.

I sense moments of liberation on the first day of the time journaling since it prompts me to look at the clock less often. Not looking at the time makes me feel like I own more time. After a couple of days, I notice how challenging it is to avoid checking the time. Wherever I go, the microwave, my phone, and any other screens alert me to what time it is. I plan my daily commute perfectly, so as not waste my time on the street waiting for the bus. When I feel hungry, I check the time to see if it is an appropriate time to eat. Before I go to bed, I check the time to make sure I sleep for six to eight hours, which I hear as an

appropriate amount of sleep. From the moment I wake up until I unwind in bed, my entire day is shaped by minutes and hours.

In the middle of the semester cycle, living in an urban apartment, I cannot escape a linear, quantified structure of time. As I write down reasons and feelings of why I check the time, the accumulated notes begin to translate the tendency and urgency to utilize time productively—the more work I do in a given time, the better productivity I achieve. I begin recognizing inherent modern values of convenience, efficiency and productivity ingrained in my day-to-day relationship with time. There is no space for "subjective time"—natural, bodily sense of time, my own interpretation of time(Buonomano, 2018, 15). What clocks objectively translate in a numerical form appears to be the dominant structure ordering our day, prioritizing what we can and cannot make time for, and influencing how we live day to day.

I suddenly remember I used to enjoy cross-stitching growing up. I pick up needles and threads to stitch the frequency of times I look at the clocks, sewing them on the fabric to place on a second-hand clock. I use seven different thread colours to mark each day separately based on the traditional Korean colour spectrum—*오방색, Obangsaek*[1]. I begin stitching from the clock's centre with red thread to mark the first day and blue for the next day. Each stitch aligns with the ordinary divisions of the clock to function without the numbers, displaying how many times I check the clocks within each hour. Stitching quietly, using my fingertips to find the right holes, I lose track of time.

1.
Obangsaek is the colour scheme of white, black, blue, yellow, and red colour that is commonly used in traditional arts and textile patterns in Korea. *Obangsaek* combines *the Five Elements and Five Colours theory* from China, and each colour holds its own meaning in Korean culture.

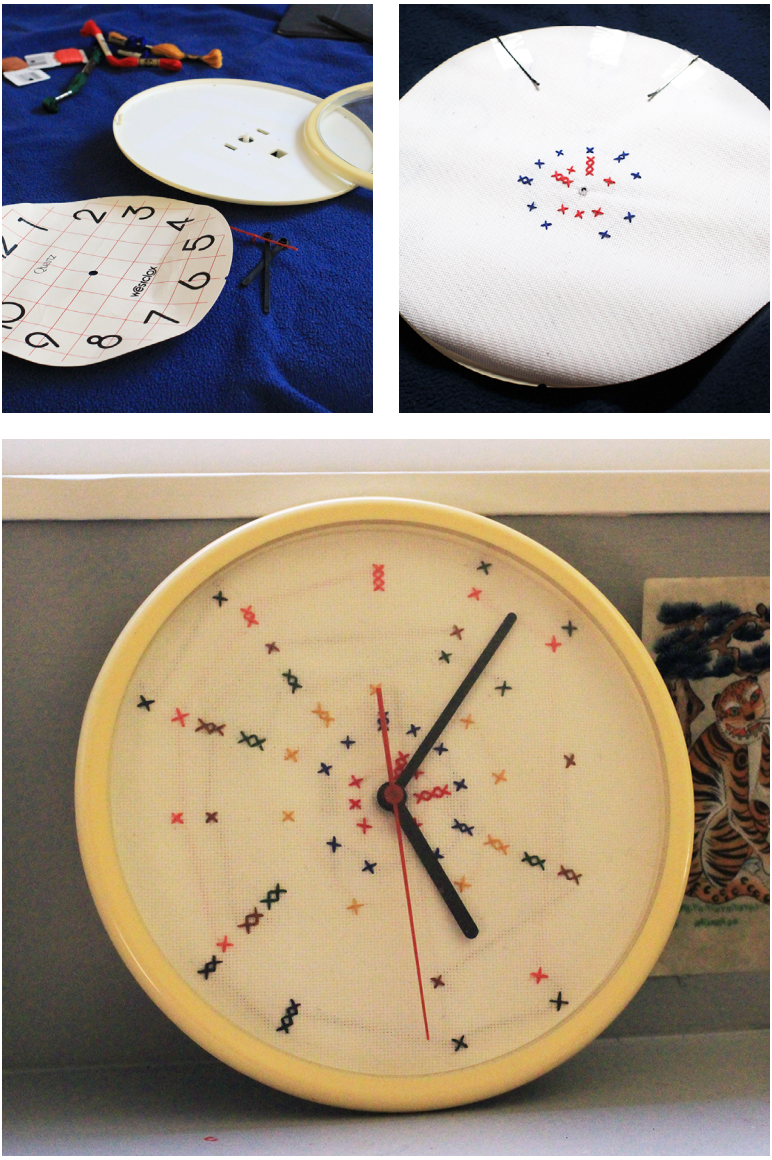


Figure 3-5.
The images of the cross-stitched clock.

Backcountry Camping, Break Time

This directly experienced terrain, rippling with cricket rhythms, and scoured by the tides, is the very realm now most ravaged by the spreading consequences of our disregard. Many long-standing and lousy habits have enabled our callous treatment of surrounding nature, empowering us to clear-cut, dam up, mine, develop, poison, or simply destroy so much of what quietly sustains us (*Abram, 2011, 6*).

David Abram, Becoming animal, 2011

I plan a backcountry camping for another time journaling prompt. I am curious to compare my relationship with time from an urban setting and contrast it with rhythms informed by natural surroundings. I follow a similar method as before, but I ditch the clock time completely this time.

I wake up to the sound of raindrops on our tent. What a luxurious start to the day, despite minor backaches. It feels weird not knowing the time. I am still determining how long I have been drinking this coffee and if I want to know. I do not know when I wake up in the morning, when I should eat lunch, or how long it will take to drive back to the nearest town. The tide is coming in and out right in front of the campsite. Freshly chopped cedar tree for fire smells so fragrant.

I stare at the water, geese, clouds, and other beings sharing time and space with me. I remember I can use the sun's path to tell time. The sun is around the east, so it must be still early in the morning. I fail once to avoid looking at the time when I check my urgent emails to schedule meetings for the week I get back. I go for a walk before the tide returns and collect driftwood for fires. I make sure to prepare dinner before the sun goes down. I go to bed because the rain starts falling again. I wake up when the birds sing loudly. Mundane decisions follow the rhythms and timings of nature.

Figure 6-8.
The natural surroundings of the North Thormanby Island.

Dean Buonomano, a neuroscientist who researches how brains tell time, explains our unique ability to conceptualize time and the foreseeable future as being essential to survival. Predicting the Sun and the Moon, seasonal changes, and reading patterns in natural phenomena was an extremely precious source of information to sustain living (Buonomano, 2018). To our ancestors, tracking time is fundamentally calendric. Days of backcountry camping without having to use clock time, I experience time through the lens of nature, organizing my new daily routines depending on the most visible ways of measuring temporality—the ups and downs of the celestial bodies in the sky and the patterns on the sand that are made by the rising and falling tides. Slowly embodying the knowledge and experience of the terrain I am surrounded by, I collect evidence of different passages in time. I catch myself sensing unfamiliar ways to relate to time, although looking up at the sky to guess the time of the day feels foreign and almost silly.

Consciously interacting with time in two different surroundings—the urban setting with the presence of clock time and the backcountry environment with the presence of natural cycles of life and ecological systems—I sense hidden characteristics of time as the fundamental structure of everyday living. The preoccupation with numerical, uniform, and comparable time measurement in modern society offers an agency to live efficiently and productively. Under the belief that time is like an arrow or scarce like gold, rather than cyclical, the economic associations of temporality become a baseline relation to time. It interrupts us from recognizing what an industrial relationship with time inevitably prioritizes. New questions arise, does this lack of time-awareness work to keep us away from the joys of wasting time? And more seriously, are our notions of care for the lives of other-than-humans and the possibilities for human inhabitable futures of the planet tied to how we measure and interact with time?

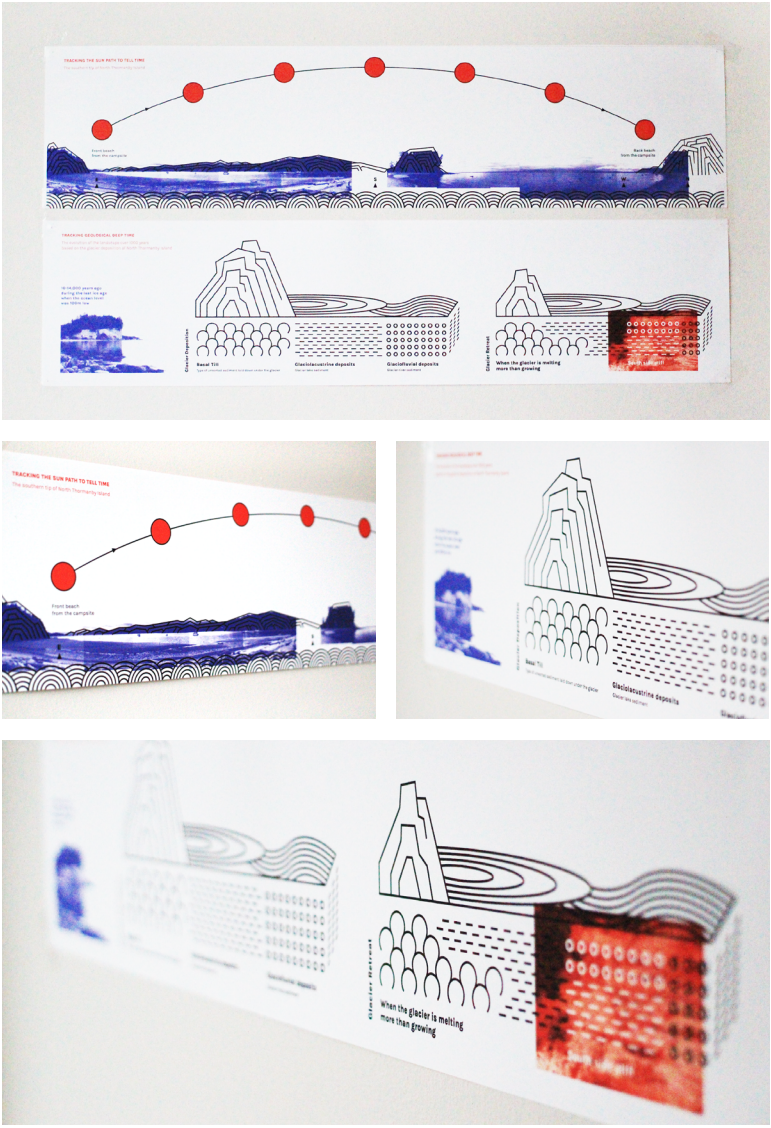


Figure 9-12.

The infographics of the Sun's path and geological time around the North Thormanby Island.

Time Explorations *Chapter 2.*

Design of Time and Social Priorities

Agricultural, Korean Time
Industrial, Coordinated Universal Time

Agricultural, Korean Time

Societies that hunt and farm need to know the seasons, fishermen and navigators need to know the tides. Why have calendars at all? In order to predict the regular patterns of nature. In an agricultural society you need a solar calendar to know when best to sow your crops. In a society that lives by fishing you need a lunar calendar to know the tides. Yet it's impossible to establish a simple arithmetical relationship between the two that would bring them into harmony (Eco et al., 1999, 4).

Stephen Jay Gould, Conversations About the End of Time, 1999

I try remembering the sweetness of red bean porridge in my mouth when the night stretches over winter. Korean people believe eating red bean porridge on winter solstice protects us from evil spirits and misfortunes. My motherland was a predominantly agricultural society until the 1960s, and as such, it used the lunisolar calendar for over 1,000 years along with many other Asian countries.

The lunisolar calendar consists of both the Moon phase and the time of the solar year, which is the Sun's position in the Earth's sky. "Months are lunar, beginning on the day of the new moon and ending on the day before the next new moon" (Dershowitz & Reingold, 2008, 247). The calendar breaks down the solar year into twenty-four solar terms, or seasons, and each solar term is a period of approximately fifteen days corresponding to "15º segments of solar longitude" (2008, 248). In the lunisolar calendar, each name and meaning of these twenty-four solar terms are contextualized into seasonal divisions in ways which convey intimate human interactions through the changes in natural phenomena to sync agricultural activities.

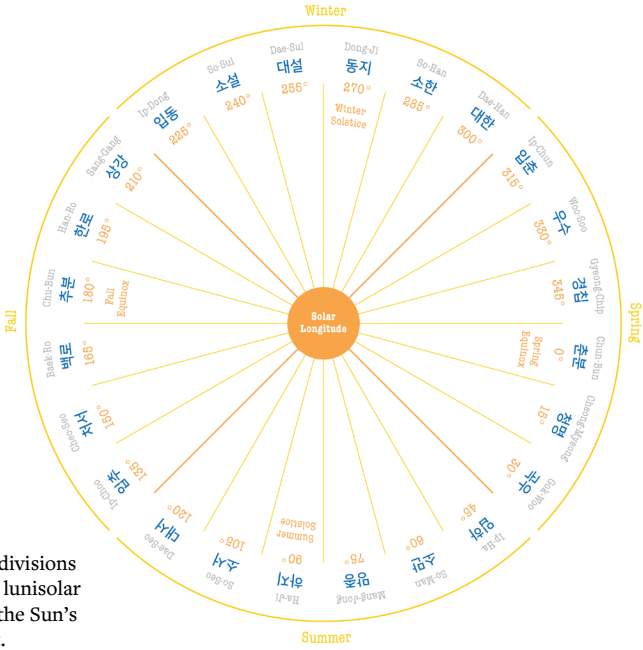


Figure 13.

The seasonal divisions in the Korean lunisolar calendar and the Sun's annual circuit.

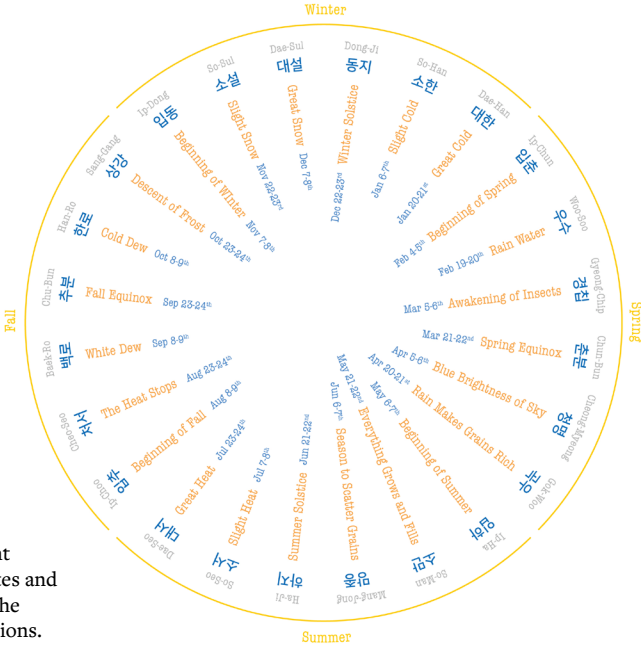


Figure 14.

The equivalent Gregorian dates and meanings of the seasonal divisions.

The design of the lunisolar calendar functions to remind and harmonize cyclical patterns in nature with people's everyday living. Far away from my homeland, I give myself time and space to remember and reflect on some of the seasonal divisions, their unique names, and the relational contexts they marked:

> *경칩 Gyeong-Chip* (the equivalent date is March 5-6th on the Gregorian calendar) marks the day of the awakening of hibernating insects. In this third solar term of spring, living beings awaken from their winter sleep and this date implies that the weather will steadily become warmer. In Korea, this season is associated with the awakening of frogs and some used to believe eating frogs or salamander eggs keeps them healthy throughout the year.
>
> *소만 So-Man* (May 21-22nd) is the second solar term of summer, which interprets that the sun is abundant and everything grows and fills up the world. Barley sprouts grow, wild plants bloom, bear fruit, and people are busy preparing rice transplanting. *So-Man* is a busy season for both nature and people.
>
> *대서 Dae-seo* (July 23-24th) means great heat. The rainy season is over in Korea, and the weather starts to heat up significantly. An old proverb says, *"Goats' horns melt in Dae-seo."* People visit nearby mountain valleys and streams to avoid the heat and relish drinks and seasonal food to stay energetic. Around *Dae-seo*, late July and early August remain the peak of summer holiday seasons in Korea.
>
> *처서 Cheo-seo* (August 23-24th) means the summer heat stops and fresh fall comes. As the scorching summer sun softens up and weeds no longer grow as much, people mow grass in their rice paddies and ancestors' graves. A proverb goes, *"Mosquitoes' mouths become crooked after Cheo-seo."* Flies and mosquitoes start to disappear, and crickets appear one by one due to the coolness around *Cheo-seo*.

As Abram reflects, in *Becoming Animal: an earthly cosmology*, "Our indigenous ancestors, after all, had to survive and flourish without any of the technologies upon which we moderns have come to depend" (Abram, 2011, 43). Their tangled kinship and dependence on the natural timing of the land and other-than-humans determined their usage of time and ways of living. I remember more proverbs and sayings that speak of ecological wisdom to guess the climate and weather. I envision the time my ancestors spent translating the complicated relational language of their environment to thrive within nature, not seeing themseves above or apart from it. They believed we could communicate with and learn from nature if we knew how to listen.

If swallows fly low, it rains.
제비가 낮게 날면 비가 온다.

Typhoons occur frequently if magpies build their nests low.
까치가 낮은 곳에 집을 지으면 태풍이 온다.

The weather is nice if spiders spin webs.
거미가 줄을 치면 날씨가 좋다.

When ants move houses, it rains.
개미가 이사하면 비가 온다.

If the leaves fall early, it snows early.
낙엽이 일찍 떨어지면 눈이 일찍 온다.

When spring flowers bloom again in autumn, the cold weather of the year will come late.
봄꽃이 가을에 다시 피면 그 해는 추위가 늦다.

The lunisolar calendar was originally derived from ancient China during the Zhou dynasty period and is widely used in East Asian cultural spheres. Korea uses almost identical names, dates, and meanings to the Chinese calendar and twenty-four solar terms,

however, a few summer and winter terms are interpreted differently for the Korean context due to geographic differences. Since the solar terms are named after the climate in the North China Plain, the timings of weather patterns implied in the meanings of their names do not always sync with Korean unique geography and climate.

小暑 *Xiǎo shǔ* (June 7-8th), for example, refers to slight heat in Chinese which describes the summer heat that begins around this seasonal division. However, 소서 *So-seo* in Korea—directly translated from the Chinese term—is in the beginning of the monsoon season due to the moist air from the Indian Ocean and Pacific Ocean traveling back and forth around the Korean Peninsula, which forms differing seasonal rain patterns. Instead of marking the beginning of the heat, humidity is at its peak, and the hot summer days kick off once the constant rain eases out, a month after 소서 *So-seo*. Other differences in the meanings of the solar terms lie in 小寒 *Xiǎo hán* (January 6-7th), which refers to slight cold, and 大寒 *Dà hán* (January 20-21st), great cold. In Korea, the equivalent terms, 소한 *So-han* and 대한 *Dae-han,* are interpreted in the opposite way. 소한 *So-han* marks the coldest time of the winter, and 대한 *Dae-han* gets relatively warm due to the different weather phenomena caused by geographical differences between the Korean Peninsula vs North China. Using the positions of the Sun and Moon to mark cyclical time, the lunisolar calendar assisted people in understanding the trends of their local climate, witnessing, and embodying the seasonality of natural cycles, which allowed them to sustainably secure food for each year. I reflect on the importance of how lunisolar calendars were specifically adapted to their unique geographies, climates, fauna, and flora.

After countless generations of using the lunisolar calendar, in 1896, Korea adopted the Gregorian calendar. This occurred during the last years of the Chosun dynasty, the last dynastic kingdom (Dershowitz & Reingold, 2008), which was characterized by a time of transitions

towards modernized and westernized structural changes from a Confucianist society facing waves of threats from the foreign powers, especially the Japanese. This complex period of Korean history saw Japanese colonisation, the Korean war, and a period of accelerated capitalist development. Growing up in a post-industrialized South Korea, I experienced a handful of traditional seasonal customs: posting calligraphic notes on entrances to wish for a prosperous year in *입춘 Ip-chun*, the beginning of spring; swinging fire cans on my uncle's farmlands to get rid of harmful insects during *정월 대보름 Jongwol-daeboreum,* the first full moon of the lunisolar year. But most of the seasonal holidays were reduced to small, relatively unimportant bits of information on the calendar, printed in a small letter size, almost invisible. The relational meanings of the seasonal divisions, embedded living knowledge and expressions of seasons and timing of the natural environment are all but forgotten or turned into something fragmented, often reduced consumeristically to a special food or statutory holiday festival.

In *Conversations about the end of time,* Stephen Jay Gould—an American paleontologist, evolutionary biologist, and historian of science—explains the reason we have calendars is to predict regularity in the natural environment, which informs the unique surroundings of each society to sustain their living (Eco et al., 1999). The lunisolar calendar was adopted in agrarian societies like Korea, but in the transition to a modernized and industrialized society, the Gregorian calendar became the more useful tool. It allowed people to schedule, organize the labour and production of a society in sync with a changing world—priorities in production, progress, development, and prosperity for the future.

I speak about my research to my family, and my dad reminds me that the seasonal divisions of the lunisolar calendar are still in use in rural farming areas. I stumble across a report announcing the results of climate change trend analysis in Korea's past with observation data

since 1912 (The Korean Meteorological Administration, 2021). The report summarizes that summer days are now twenty days longer and winter days are twenty-two days shorter than a hundred years ago, resulting in the desynchronization of seasonal divisions of the lunisolar calendar with the current weather patterns (fig.15-16). Each year, precipitation increases, however, the number of days with precipitation decreases due to the changes in climate. With more extreme and intense rainfalls during summer and fall, winter and spring seasons experience more frequent droughts.

The new realities of the climate change challenge the predictable divisions and characteristics of the weather patterns marked on the lunisolar calendar. I begin to wonder how we should trace, mark, and name these unpredictable, rapid climate changes as the Earth's temperature continues to rise. How might we adapt ourselves and our everyday living to the unseen timings of the natural environment?

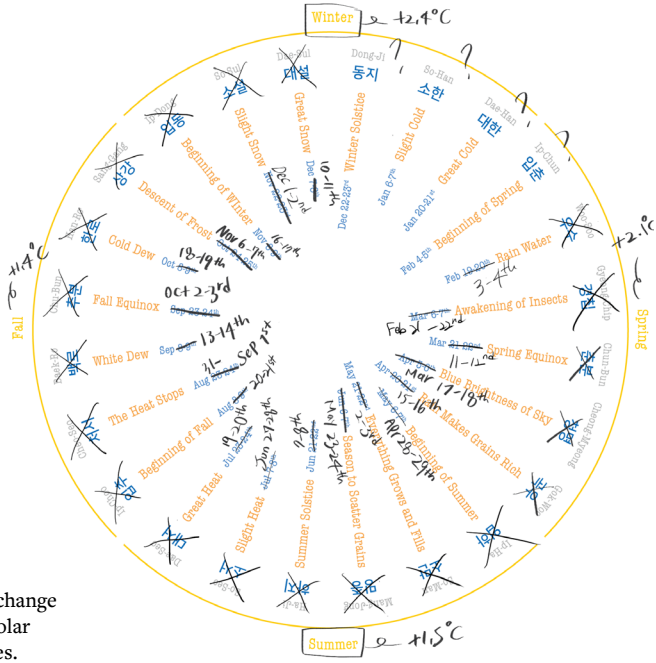


Figure 15.

The climate change altered lunisolar calendar dates.

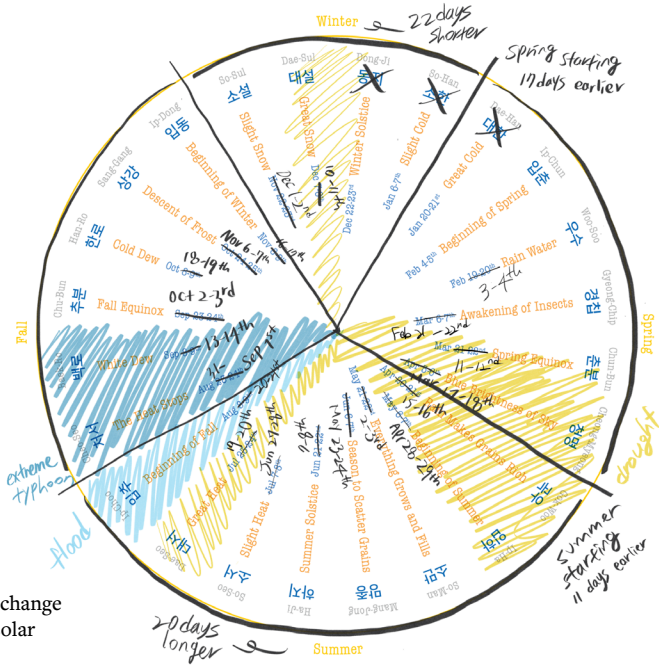


Figure 16.

The climate change altered lunisolar calendar.

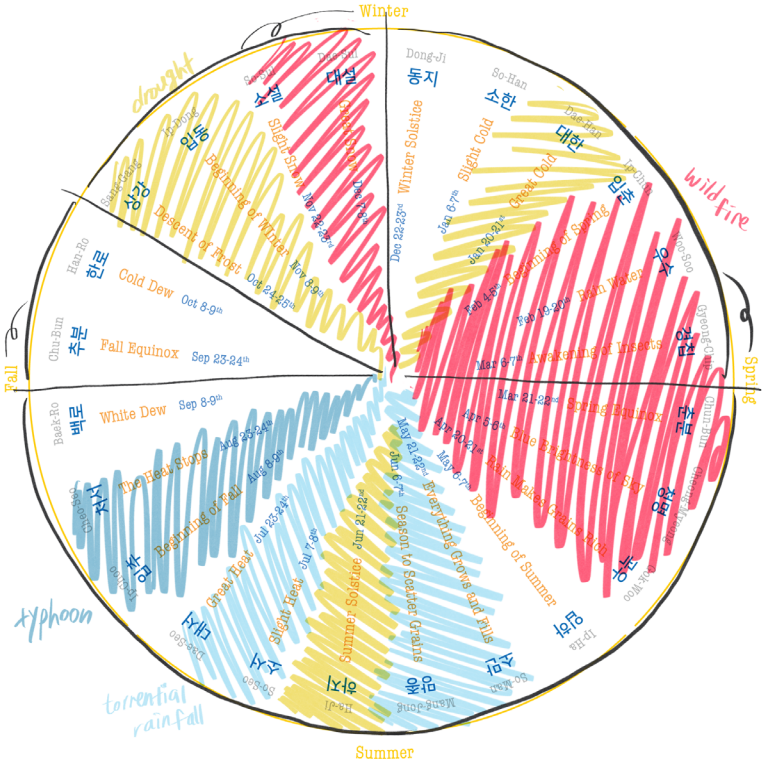


Figure 17.
Speculating the future of the climate change altered lunisolar calendar.

Industrial, Coordinated Universal Time

Traditional rhythms began to look indolent and even primitive. The division and synchronization of labour became the norm in many manufacturing sites and, after a century of propaganda, manufacturers' time came to seem natural (*Gay, 2003, 110*).

Hanna Gay, Clock Synchrony, Time Distribution and Electrical Timekeeping in Britain 1880-1925, 2003

I often look up what time and day it is in Korea and a few other places in the world where my friends and family live. Finding the overlapping window of time to catch up with my loved ones is a mission when the time difference adds up to seventeen hours. Reminding myself of the mathematic grid design of time frequently—an artificial social agreement—sparks a curiosity. When did we unify time worldwide, why, and how did it happen?

In October 1884, the Government of the United States held the International Meridian Conference in Washington. European nations desired a unified way of recognizing time in order to accommodate increasing steamship, railway, and telegraph activity. To facilitate the process, America invited all nations with which it had diplomatic relations, to come together, "for the purpose of fixing upon a meridian proper to be employed as a common zero of longitude and standard of time-reckoning throughout the globe" (Various, 2006).[2] From this conference, the Royal Observatory of Greenwich—located on the outskirts of London—became the prime meridian for longitude and the base to measure standard clock time.

2.
This quote is inserted from *The Project Gutenberg EBook of International Conference Held at Washington for the Purpose of Fixing a Prime Meridian and a Universal Day.*

Beginning the roughly seventy-years-long pursuit of establishing a coordinated global demarking of time, assisted the expansion of globalization in the second half of the nineteenth century, creating "markets for goods, capital, and labor; migration, imperialism, and colonialism; and internationalist movements reaching beyond the nation-state" (Ogle, 2013, 1380).[3] This promise of time among imperial and colonial countries of the North Atlantic world, and their borderless capital flows, slowly erased many local ways of recognizing time across the globe.

The International Date Line determines whether countries along 180 degrees away from the meridian would be twelve hours ahead or behind of Greenwich Mean Time. However, this date line is not so straight. It is made of concavities and convexities accommodating the local circumstances, such as the Bering Strait between the U.S. and Russia, and lumps of Pacific islands. It has been changing over time, based on the influence of trade relations and competing economic goals of powerful global forces. Ariel describes this line is an arbitrary product of "the feverish imaginations and whims of politicians and mandarins, not caring for the rest of the world" (Ariel & Berger, 2006, 142). Tracing the unknown histories to grapple with how time functions the way it is, the values and priorities of the world reveal themselves. The purpose of time unification represents a preference and arrangement of the world—the pursuit of wealth, material abundance, growth, progress, and power. The engineering of unified timekeeping was crucial for the expansion of the economy, thus preferred by the people who held power to make decisions on a global scale, represent their nations and colonies, consult, and negotiate policies.

3.
Vanessa Ogle is a historian and an assocdiate professor at UC Berkeley who researches the history of Western Europe in the context of capitalism, imperialism, colonialism, and the world economy in its interactions with the broader world. In *The American Historical Journal*, Ogle describes the multitude of social times and socio-political circumstances in India and Lebanon when their local times started to fuse with the introduction of Greenwich Mean Time.

Figure 18.
Sketching the International Date Line on the map.

Geoscience professor Marcia Bjornerud shares the geological perspective of time in her book *Timefulness.* Bjornerud uses the term "*time-literate society*" to express our confined relation to time in comparison to the intergenerational timescales in geology (Bjornerud, 2020, 20). The author expresses that the inability to comprehend our impacts on multigenerational scales leads to the increasing planetary crisis—futuring steeply risen sea level and extremely altered weather patterns. Referring to the Anthropocene, an unprecedented epoch in the geologic timescale, she addresses that we have reached a threshold where there are more man-made environmental changes than natural procedures of geologic and biological processes.

The promise behind the calculating, marking, and coordinating time into a universal cohesive system represents the values of the era, the priorities of power, national interests, and flows of capital. Suppose we aim to prefer ecological health instead of economic success, the abundance of life instead of material prosperity, and empathy for all

beings instead of willful disregard of our interdependencies in a finite system. How might we measure and relate to time to include these other more holistic priorities and essential relations? More uncomfortable questions arise without knowing how to answer. I reach for threads and needles again.

Figure 19-20.
Stitching the time map:
The meridian line (top), the time differences (bottom).

Figure 21.
Stitching the time map.

I stitch a zig-zag line along the prime meridian using a reprint of *Stanford's General Map of The World* from 1920. More than a century later, this arbitrary line is still present on our maps today. From the centre of the UK, we relate, calculate our time and space to different places worldwide (fig.22); Avoiding taking the natural, direct route across the Pacific Ocean, the time difference is seventeen hours between Korea and Vancouver (fig.23), and nineteen hours between Melbourne and Vancouver, with the calculation of the international date line. I pick up a red thread and materialize more than twelve hours time difference from my location, all the way to Korea and Australia; blue thread for eight hours; and green thread for less than three hours. These anthropocentric, rational, calculative static lines make the distance between myself, and my friends and family feel further than it is.

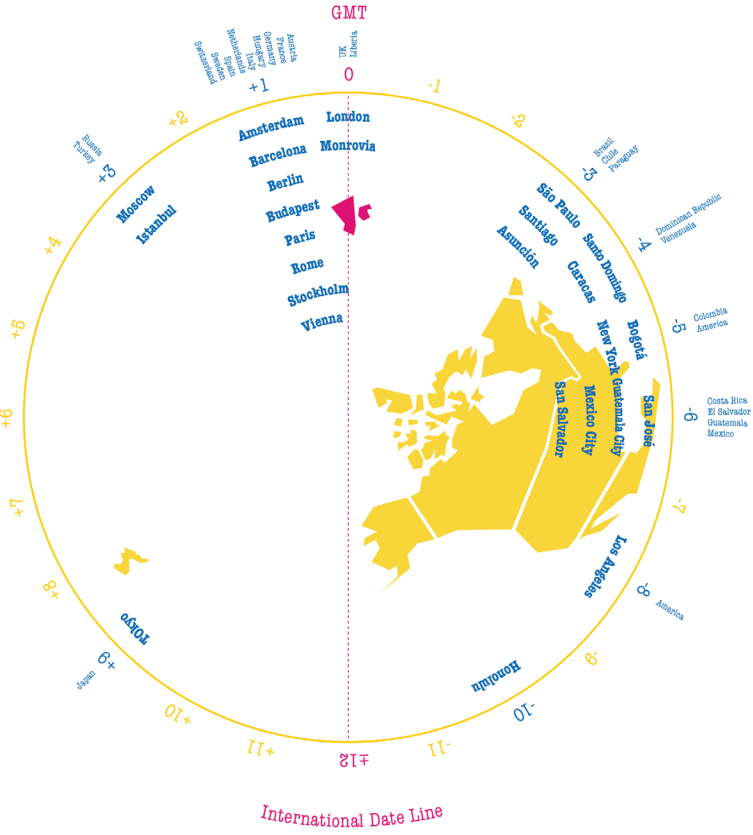


Figure 22.

The time differences between London and the countries' major cities that participated in the 1884 International Meridian Conference.

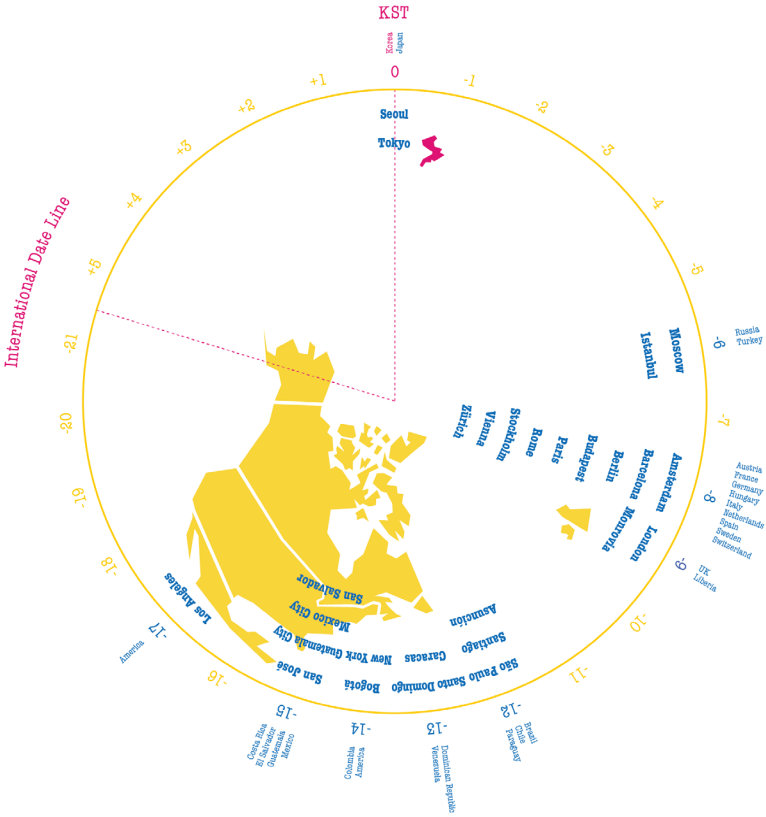


Figure 23.

The time differences between Korea and the countries' major cities that participated in the 1884 International Meridian Conference.

Time Explorations *Chapter 3.*

Time Traveling through Memories and Knowledge

The Breath of Generations and Plants

Walking with Indigenous Stories
in the Canadian Heritage Garden at VanDusen

The Medicine Wheel Ceremony and Ohaeng Theory

The Breath of Generations and Plants

Our ancestors gave us membership into nations and traditions; location both remembers and "re-members" us to those things (*Kovach, 2021, 111*).

Margaret Kovach, Indigenous Methodologies, 2021

My grandmother was born in 1923, seventy years before I was born. I imagine what I could ask her if she was still here. I regret the chances I missed to ask about her life experience directly, the stories which can only be obtained through her time of being alive. Reflecting on the traditions and rituals that come from ancestral knowledge, I realize their lived experience and perspectives of the world overcome our individually limited time on earth. Through my parents, the knowledge my grandmother has carried intimately in her body and mind, passed down and becomes part of me, blurring the lines between our gaps of time.

Exploring plural concepts of time and its fluidity, I enter the space of ancestral time through living and breathing memories of my heritage. I grew up eating fresh mountain herbs, mushrooms, and roots of native plants my dad foraged. His place-based knowledge—literacy of edible, medicinal plants in each season—fed my flesh and bones, letting me absorb the wind, rain, soil, and terrain of the environment that is no longer visible in the city. I do not hold such knowledge, my dad has accumulated this wisdom through a lifetime of observations and interactions with the mountains. My thoughts linger around this unavoidable amnesia as each generation passes to the next. I become curious about the surroundings my family lived in during the 60s and 70s in a rural mountain town in South Korea, compared to my contemporary urban living conditions. I urge my dad to tell me about the everyday living environment of his early life without restaurants, grocery stores, and roads made of asphalt and concrete.

1. Do you have any specific memories from everyday living in the mountains and farm fields?

2. Where does your plant knowledge come from?

3. What plants do you still remember how to distinguish?

4. How long would a beginner like me take to learn your foraging knowledge?

5. After you moved out of the mountain town and started working in the city, did you still visit the mountains to forage?

6. What were the main seasonal activities you had to do each year?

Hearing my dad's responses over the phone, vibrating with nostalgic stories carrying laughter, gratitude, and sometimes heartbreak, his memories make time travel possible. The social context of my parents' generation is that of growing up shortly after the Korean War in the late 60s and 70s. During this time, the South Korean government was taking "many shortcuts to achieve economic success," pursuing compressed capitalist development in an unprecedented speed (Lim, 2015, 9).

Witnessing the forests, farm fields, mountain valleys, and other-than-humans that are weaved through my dad's memories—in contrast to the remarkable levels of industrialization happening in the cities—I reflect on my modern efforts to participate in ecological ways of living as a city dweller. Unlike my dad, who had no other choice but spending time learning how to identify edible, medicinal plants to make a living, I negotiate how much discomfort I am willing to experience. To carry out environmental responsibility on an everyday level, I voluntarily compromise speed, comfort, convenience, and efficiency, yet I am detached from the knowledge and skills to live fully in harmony with nature. The traditional knowledge to make clothes to wear, food to eat, and artifacts to use daily is replaced by

modern society's industrialized products and services, conveniently helping me save time. We often have very little tangible connection to most of the goods we consume, the origins of their materiality, the labour of those who made them, even where they will go when they are no longer useful to us.

	Me	Dad
Dependency on nature	***Indirectly dependent (Mental and physical well-being)***	***Directly dependent (Sustaining livelihood)***
Values in nature	***Ethics and aesthetics***	***Utility***
Contact of nature	***Living separated***	***Living with***

Figure 24.
A table to compare the differences between me and my dad's relationships with nature.

Walking with Indigenous Stories in the Canadian Heritage Garden at VanDusen

That indigenous people are aware of a large variety of uses of local biodiversity including medicinal uses which have been incorporated in the modern pharmacopoeia is well known, as is their knowledge of habitat preference, life history, and behavior relevant to efficient foraging for resources. Such knowledge is explicit and socially transmitted from one individual to another within and across generations in the same manner as scientific knowledge (*Gadgil et al., 1993, 151*).

Madhav Gadgil, Indigenous Knowledge for Biodiversity Conservation, 1993

I worry about what knowledge I could pass on to my unborn children and a future where they only experience urbanized, disrupted, and displaced terrains by our modern life-sustaining activities. I participate in *the guided Natural Heritage Walk* at VanDusen botanical garden, one of the few places in the city that could take my senses away from the urban landscape.

Figure 25.

The Natural Heritage Guided Walk by indigenous coordinator, Geronimo Alec at VanDusen Botanical Garden (top left).

Figure 26-27.

The photos of Salal (top left), and the tree seeds at VanDusen (bottom).

The indigenous coordinator at VanDusen, Geronimo Alec, guides us through the paths of the Canadian heritage garden and tells us the tales of the medicinal plants and the first nations' people. Their entangled stories encourage me to walk gently, mindful of the surroundings of native species that are endangered which used to fundamentally support generations to survive. I quietly acknowledge the plants' essential presence in Coast Salish culture and witness a mutualistic, cooperative stories between humans and nature—humans satisfying everyday needs based on what nature offers.

Modernity has bestowed numerous social and technological advances that brought much of the world out of burdensome and labour-intensive lives (Wood, 2003). With increasing sophistication also came increasing complexity of manufacturing processes and specialization of expertise and labour, such that production systems are highly differentiated and spread across the globe (Feenberg, 2010). Manufactured goods are largely made somewhere far, remote from the context of daily surroundings. Thus, modern living depends on the value of an individuals' time to afford goods and services—produced by someone else's time and labour—shipped and flown across the globe. The global scale of the consumption-based living environment pushes us further from being connected to the land, people, and other beings.

Gideon Kossoff, who teaches and conducts the research in Transition Design and Ecoliteracy, explains the philosophy of holism and the reconstitution of everyday life to discuss a framework for a sustainable society (Kossoff, 2015). He points out that losing control of place-based self-sufficiency of communities, as he describes as "the decline of the Domains," by the globalized marketplace causes the unsustainability of everyday life (2015, 35). Kossoff argues that we need to understand the system (whole) and everyday community (part) as a reciprocal structure rather than hierarchical anatomy of wholes come before parts. He argues everyday life becomes

sustainable when communities' needs are satisfied by diverse, autonomous, emergent, and interrelated networks of everyday life domains.

Aligning with Kossoff's idea, Adrienne Maree Brown in *Emergent Strategy* introduces mutualism as part of the framework of emergence[4] (Brown, 2017). She shares the idea that natural selection requires mutual relationship not individual, and species sustain only if they cooperate within their community. Considering the notion of holistic health of a species that is mirrored in the health of an individual, I ponder upon this concept of interconnectedness, the disappearing relationship in our mundane living. As Kossoff says, "The mutual participation that previously enabled people, artifacts, and nature–the parts of everyday life–to belong together is now diminished" (Kossoff, 2015, 32). As Brown points out, most of us are socialized for independence—through the belief of "constant growth, violent competition, and critical mass" (Brown, 2017, 17). Our fragmented independent perception of time confesses the lack of interdependence and mutualism in understanding and seeing the whole we collectively make up—acting blindly without considering future ancestors of the human and otherwise.

> *Dependent on 'natural rhythms' oriented to a variety of tasks related to an agricultural economy, these older notations were replaced by a new manufacturers' time, a precious commodity measured in monetary terms (Gay, 2003, 109).*

I think of the wisdom imparted from prominent indigenous writer and storyteller, Thomas King, through the underlying message of his 2003 Massey Lectures, that "the truth about stories is that that's all we are" (King, 2003, 5). King reminds us that we need to be mindful of the

4.
Throughout her book *Emergence Strategy,* Brown refers to Nick Obolenksy's definition of emergence: "Emergence is the way complex systems and patterns arise out of a multiplicity of relatively simple interactions" (Brown, 2017, 15).

narratives we are told, and those we tell others, about the world. As an example, the author shares two creation stories, one Christian and one Indigenous, contrasting the different world views, relationships, and values inherent in each. In the Christian story of Genesis, creation is an individual act of a singular supreme deity creating a perfect world governed by rules and hierarchies, "God, man, animals, plants." In the Indigenous creation story of Charm, the Skywoman, the creation of the world is a shared activity between humans and animals, who negotiate the shape of the world and work to must maintain balance and harmony (2003, 28). In the closing of the lecture, King asks would we live differently if we only had heard this story as our core story, while reminding us... we have heard it now.

I oscillate between the stories of my dad and the Coast Salish people, living and breathing memories that sustained generations through the collective place-based knowledge of nutritive and healing plants. Tracing ancestral time—learning about food plants of the coastal first peoples and listening to my dad's childhood memories—I travel across time and find a living environment which fosters an attentive partnership with nature. From the stories and knowledge of my dad and the indigenous coordinator at VanDusen, I experience concepts of time that capture a forgotten cooperation with nature, the relational and intertwined reciprocal interactions of plants and people. I question how to interpret time and everyday living differently to revive a mutual relationship with nature. I repeat the stories to myself to remember the times when nature was feared, worshiped, and respected sacredly.

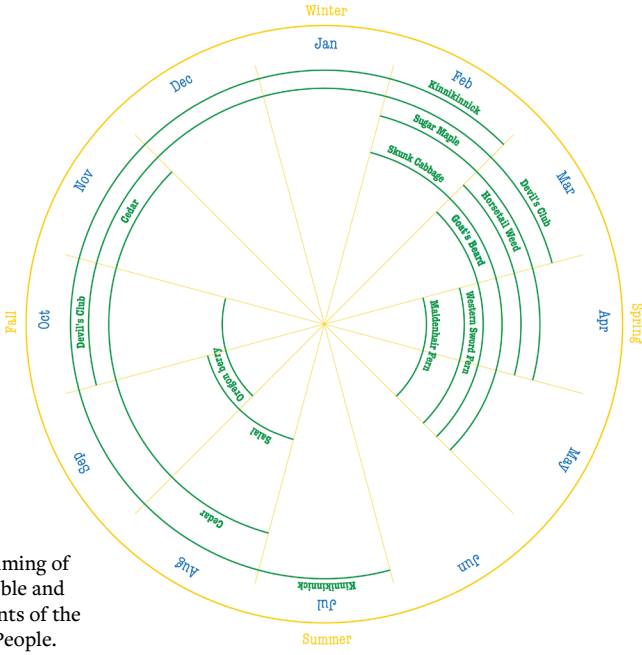


Figure 28.

The harvest timing of important edible and medicinal plants of the Coast Salish People.

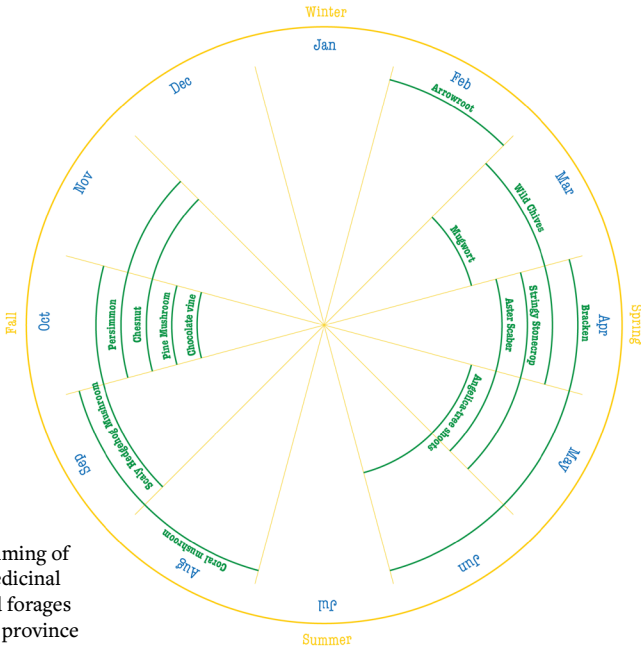


Figure 29.

The harvest timing of edible and medicinal plants my dad forages around Jeolla province in South Korea.

The Medicine Wheel Ceremony and Ohaeng Theory

[To the Blackfoot peoples] chronological order is not as important as the story contained within the [pictographs of winter counts] and, unlike the linear European method of recording history, Blackfoot "time was recorded in a circle" (p.2) (Bickford & Petrucka, 2016, 412).

Deanna Bickford & Pammla Petrucka, Re-Visioning the Winter Count, 2016

Indigenous people have been using medicine wheel ceremonies for over 5,000 years to bring balanced health and healing. I have been invited to participate on the longest day of the year, the summer solstice. I situate myself on the ground along the circle of the medicine wheel. The wheel is divided into four cardinal directions, and each compass direction holds lessons and spiritual meanings, such as the seasons, other-than-humans, stages of the human lifetime, and dimensions of one's health.

The ceremony[5] begins with singing and drumming after the smoke of burning sage cleansed the bodies and minds of the ceremony participants. The sounds of the drums and the smell of the sage transform the present time to ancient moments. Elder Phil L'Hirondelle, who leads the ceremony, invites us to close our eyes and think for all the creatures, two-legged, four-legged, plants, and rocks that surround us. With my eyes shut, I prepare my senses to recognize all the earthly beings that often sit in the background of my consciousness. My body attunes to touch the air, smell the trees, hear ravens cry above our heads, and time pauses and travels backwards.

5.
The medicine wheel ceremony I participated was at VanDusen botanical garden. Elder Phil L'Hirondelle led the ceremony based on the teachings from Bernice Falling Leaves. *https://www.vandusengarden.org/interview-medicine-wheel-ceremony*

Figure 30-31.
The images taken at the medicine wheel ceremony at VanDusen.

Sitting along the rim of the circle, I listen to the rich interpretations of the world evidencing the cyclical patterns of our mutual experience as humans on the planet Earth. Each quadrant of the wheel represents the following meanings: 1) East, West, North, and South; 2) spring, summer, fall, and winter seasons of nature; 3) beginning (0-25), adolescence (25-50), adulthood (50-75), elderhood (75-100) of human life stages; and 4) the physical, mental, emotional, and spiritual aspects of one's health. I gaze at the colourful flags that mark the four quadrants, and realize the colours are almost identical to *오방색 Obangsaek,* the five traditional Korean colour schemes.

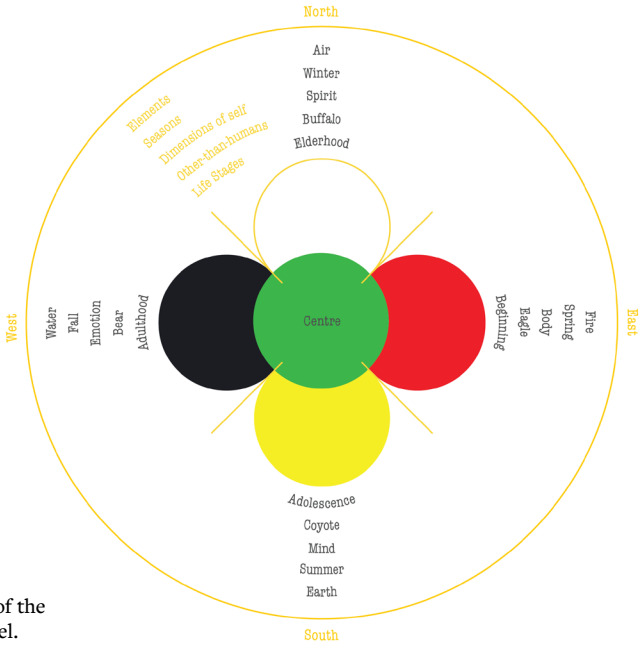


Figure 32.

The graphics of the medicine wheel.

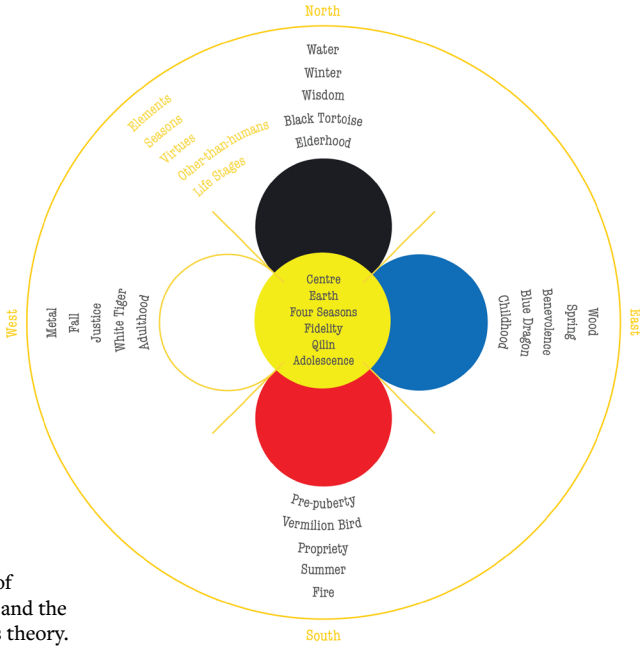


Figure 33.

The graphics of Yin and Yang, and the Five Elements theory.

The colour spectrum *Obangsaek* means the colours of five directions in Korean and is strongly influenced by the concepts of Yin-Yang and the Five Elements from China as "a living philosophy for Koreans since ancient times" (Martinson & Delong, 2012, 218). Based on a belief that two forces of Yin and Yang created the world, Korean people believed these forces generated 오행 *Ohaeng,* the five elements of earth, water, metal, fire, and wood; Each of the elements is assigned to the 오방 *Obang* (the five directions) representing centre (yellow), north (black), west (white), south (red), and east (blue) (Koehler, 2015). *Ohaeng* theory and *Obang* colours are still present in traditional artifacts—*Hanbok* (Korean clothing), paintings, and cuisine—implying to wish for good fortune and long healthy life.

As the graphics (fig.32-33) describe in detail, the symbolic meanings in both belief frameworks and cultural constructs convey similar meanings, perspectives, and values, connecting us with the outer surroundings towards the harmonious circularity. Four seasons of nature portray the stages of human life, as one of the elders in the ceremony referred to the metaphoric interpretation that what you will harvest by the adulthood and elderhood rely on what you planted and grew during the early stages of your life. The medicine wheel not only asks people to connect with the past, present, and future of themselves and others, but to pay attention to the connectivity of the body, mind, emotion, and spirit. The wheel emphasizes the holistic health of individuals in relation to other beings, teaching the value of harmony in cycles of living that are erased in the quantified, linear measurement of our modern perception of time—broken into the units of time that we forget to perceive as part of our life.

Much of the medicine wheel ceremony is spent listening to the intimate prayers of each participant, sitting alongside others with whom they had just met along the circle of the wheel. We take turns standing in each quadrant of the four directions, near the centre of the circle, and share our ancestral roots and lived stories of hope and

despair. We infuse our prayers and wishes into the stone we were asked to bring prior to the ceremony, leaving it on the ground at the centre of the wheel with mother earth. The medicine ceremony ends, standing closely with each other near the flag representing each of our age groups. I receive the gifts of connectedness, a full circle of life, in the presence of others with whom I shared this moment, but may never encounter again.

Temporal World Building

Reflection

Temporal World Building

How are we to manage our destiny as temporal beings? In what ways have human beings set about trying to tame time, to tame this dragon that is devouring them little by little? And how does language reflect humanity's ambiguous relationship with time? Is it true that for certain civilizations time doesn't exist? What is the significance, in Eastern cultures, of the notion of circular time? To what extent are these radically different conceptions of reality actually accessible to us? (Eco et al., 1999, 96).

Umberto Eco, Conversations about the end of time, 1999

How are we using our time? And what does it tell us about ourselves and the world we live in? I engage in exploratory and performative research to illuminate the underlying structure of how we treat time as a collective in the present day. Embodying a malleable attitude to time, this thesis depicts the gap between our held framework of the progressive and developmental relationship with time and how we might act differently with time to bring forth values underrepresented in linear time. Each day, individuals unwittingly perform and conform to the modern world's criteria of handling time efficiently, productively, and often in relation to a cost-benefit analysis. The dominant experience of time in developed economies is economically measured and oriented around work and productivity, which constrains the possibilities for more relational ecological concerns and the ways in which all beings and their habitats are considered. In my work, I seek to develop an awareness and literacy of time by observing the ways in which we interpret, utilize, and perceive time. The experiential research evidences complex entanglements between divergent temporalities and our ways of being.

This journey of researching time began with a question, how diverse understandings and experiences of time might support and cultivate ecologically responsible everyday living practices. Instead, following

the traces of time offers us a literacy to interpret hidden frames of the world: the underlying constructs and interconnected relationships of everyday living and the world's systems. Tracing time, remembering the traditional and cultural knowledge of Korea and indigenous worldviews open our eyes to recognize that different ways of understanding and living in the world are still present around us. These stories and relations we find from different measuring and reckoning of time are not included in an economically measured, simplified, and automatic perception of time. Various calendar systems that were developed to mark patterns of tides, natural rhythms of other-than-humans, and the agricultural timing of seasons now divide the cycles of seasons into linearly repeating weekdays and weekends. Through standardized and accurate mechanical timekeeping technologies, hours and minutes become a unified roster of our quotidian schedules and monetary returns. The dominant frames of the world—individualistic, anthropocentric, capitalist, industrial, and other contemporary values—are melted and invisibly glued into our daily perceptions of time.

In the 2020 Kreisel Lecture, a renowned Michi Saagiig Nishnaabeg scholar Leanne Betasamosake Simpson introduces Anishnaabe life as "a persistent world building process," the everyday practices of indigenous living—sharing knowledge, building moral and philosophical understandings, and making processes for dealing with issues—perform the values and beliefs in "continual, reciprocal, and reflective" relationship with the land (Simpson, 2020). Regarding living as a performative act of world building, the literacy of time opens discussions about how we must use our time to re-establish and redevelop skills and practices for enacting time that brings other possibilities for relational care forward.

Leanne Simpson's stories of her Anishnaabe world invite us to perceive living as a creative act, that the world is made of what we decide to create everyday. Our intimate relations with the world

generate the “algorithm for living, theory and praxis” that are tangled and answering to one another, spreading inseparable, intangible connections (2020). Pondering how to design and mold the social space of time to practice ecologically responsible living, the inquiry of time confesses the values and priorities of the world that frames of time are reflected upon. I recognize how we live and use our given time on Earth is malleable and moldable and can build something radically different.

Confronting the invisible influence of time that drives people and societies steadily towards faster, more convenient, efficient, and productive ways of living, uncovers how values shape the world and how the world evolves through the accumulated values we often blindly iterate and unconsciously perpetuate. Different understandings and considerations of time mirror the modern world’s priorities, meanings, values, and driving forces. To transition towards ecologically considerate living in which we could practice relational care for all beings and our shared habitat, we need to perceive how we live everyday as a part of world building. Stretching far and beyond what we know about the world, we need to seek what we are blind to and what is hidden from us. Tirelessly wrestling and juggling between competing values of the world that we encounter and participate in, questioning what we know and what we do not know, can bring forth different meanings and values of everyday life.

Hidden Values in Time

Research outcome and future directions

Hidden Values in Time

Confronting the scale of unsustainability in our material culture can be overwhelming for designers and citizens alike. Given the overwhelming complexity of our globalized economic systems of distribution and manufacture of goods, services, and technology, it is difficult to know what cultural shifts are needed to foster systemic level changes. One of the key barriers that is investigated in this thesis is our relationship with time, in particular, modernism's linear progressive model of time that designers are most familiar with and its emphasis on the future.

I wanted to know how time structures us and the hidden values embedded in our perceptions of time that strain us to perpetuate the systemic scale of unsustainability in everyday living. In this work, I have explored and traced different patterns of time to defamiliarize and question them in hopes of developing an active awareness and understanding of how different temporal structures open or limit our ways of being. Identifying patterns of time and the values they are tied to are difficult to notice and connect with our attitudes to living when time continues to exist in a passive and automatic conceptual space. We are often too immersed in their flows to be consciously aware of and experience them. Yet, recognizing and reflecting on time's influence on our behaviours, values, and priorities (even if they are not in the foreground of our perceptions) is critical to interrogate the values they support and ignore.

The implications of not understanding how time structures us run the risk of reinforcing what Dilnot and Fry refer to as defuturing activities—ways of being that passively perpetuate the ecologically destructive behaviours of using the world around us in the name of economy, growth and progress (Fry et al., 2015). These aspirations of modernity are deeply tied to a model of linear time and a focus on the future as a site of human and technological improvement (Fry, 2020).

However, they are not always good at accounting for the cyclical patterns of other-than-human renewing rhythms of life within the finite ecosystems of Earth and its beings occupy.

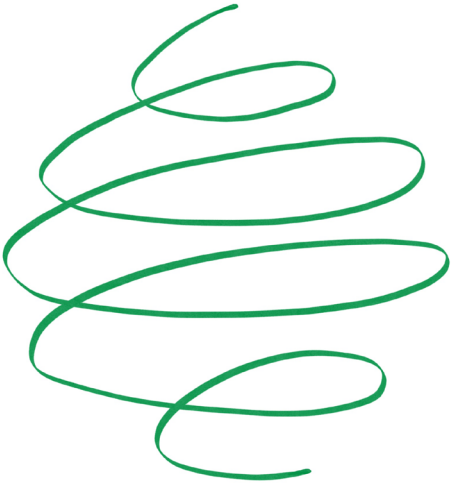
A literacy of time gives us fresh eyes to perceive that the world is not fixed in one place. It creates open practices and discourse about the world, imagining what could be different in the fundamental, taken-for-granted scale of everyday living to imagine different ecological futures. An awareness of different ways of living and being with time broadens the scope of our concerns in building the world as flourishing habitats which might sustain and nurture current and future generations of humans and other-than-humans. Everyday life needs more vigorous and imaginative reinterpretations of time to welcome ecological world building.

Interacting with multiple notions of time that value responsibility and empathy for all beings, the research has sought to develop a literacy of our changing relationality to time that is never complete or finished. This engagement with research to try out and perform different ways of being opens new spaces of consideration in the practice of design and opens even more questions for how we take them forward. Being conscious of the values and priorities we unknowingly replicate, persistent questioning, observing, imagining, and being naively curious in researching temporality, opens up the practice of design to engage with new possibilities and experiments within old ideas or practices around time（Jungnickel, 2020）. Questioning the ideas of modernity and progress that prefigure our work and how the world asks us to allocate our time, I obtain the space to contemplate and transform my way of being in practicing design.

To create a cultural shift in which ecological responsibility holds serious meaning—instead of perpetuating the extractive, developmental, instrumental prescription of natural resources—, we must confront the gap holding design between where we are and

where we want to be. In different cultures, past and present, time has meant something radically different than how we live it today in modern societies. We need to experiment with our interpretation and application of time to have possibilities to change again. Consciously reflecting on our ways of interacting with the world—the research of time lets the unfamiliar questions guide us to where changes need to occur in ourselves and the world we live in to design ecological futures.

Epilogue



Instead of drawing a closed circle, this thesis followed a series of curiosity driven questions connected like spirals, expanding and shrinking in radius without each end ever quite meeting up. The arc of the journey started and ended with a reflection upon my creative practice as it collided between modern ways of living and the finite nature of the environment.

Leaving behind a space of consumerist dominance, I attempted to expand the horizons of my design practice beyond the polished, well-curated, physical production of commercial output, utilizing my skills and knowledge to explore more intangible questions about time and how it shapes us. Sometimes feeling lost, sitting uncomfortably in this ambiguous space opened up many unconsidered possibilities for what and how I might continue to exist in design. Through these messy processes of making and reflecting on time, difficult questions arose, many of which I could not tackle in the length of a master's degree.

In a world where ecological responsibility is not yet systemically reciprocated, design practice can perpetuate extractive behaviours without considering reciprocity, sufficiency, and balance, let alone regeneration. How might we design and embed ecological values in the structures and systems of our everyday lives? Broadening the scope and application of our well-honed design methods, tactics, and skills towards ecological world building requires much more rigorous questioning and imagination as to what design can and cannot do and what can and cannot be designed.

After exploring a few of the many tangled stories of how more ecologically oriented relationships with time can restructure our priorities, concerns, and ways of life, the difficult questions of how this work moves forward from here are unclear. In many ways, I am only now at the start of my journey.

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