Cultural Memory in the Anthropocene: A Hypertext Narrative About Collecting

by

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Abstract

This thesis takes the form of a hypertext, interactive game designed to be a thought experiment on cultural memory in the Anthropocene. It is a game, a form of research-creation, and a question. The question posed is simply: what cultural memories and memory objects do we make, forget, and reconfigure in the Anthropocene? It is a question for all "readers" of this project, and one whose answer will hopefully be informed by the narratives and research you find within this game. The thesis-game explores memories found in industrial waste, climate-change-induced traumas, ecological localities, and the memory systems that predate or will postdate our human-centered era. Most importantly, it explores nostalgia, fear, and hope in equal measure.

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Introduction

This game, which is linked here, was created to explore the difficulties of capturing cultural memory and the Anthropocene alike through a more traditional institutional lens. It is not meant to provide solutions but instead provide a thought experiment on why solutions are so hard to come by. The fictional world used is not necessarily meant to abstract us from our own problems but rather to reflect them back at us. This is a project of research-creation, and while it has its persuasions, it should not be thought of as a traditional nor argumentative thesis.

I use the term "research-creation"; this is a term from the fine arts world that tries to delve "into the difference between practices such as art and philosophy, or art and the political, in order to develop modes of bringing them together" (Loveless & Manning, 2020, pg. 213). I brought research-creation into the Anthropocene because of its ability to engage and connect with "anti-capitalist, feminist, queer, decolonial, ecological, and multispecies" ontologies and the passing down of that knowledge (Loveless, 2020, pg. 302). These forms of knowledge are, I feel, crucial for mitigating the more hopeless futures imagined by the Anthropocene. And, to acknowledge other ways of knowing also feels fitting for a thesis specifically made to think about the various ways cultural memory informs our past, present, and future outside the traditional "memory institution" paradigm.

This is a multimedia thesis, although if you are reading this as PDF you may not know that. It would be contradictory to believe that cultural memory can be stored in all types of information while only giving the player textual information to learn from. Hence, you will hear

sounds and look at images, and if I thought I could get away with it I would force all sorts of physical manifestations of this thesis too. But, a multimedia digital environment will have to suffice instead as an abstraction of the countless ways we have invented for storing knowledge and information. This multimedia environment is made in Twine, which is a text-game/interactive fiction engine. Twine is a web-based technology that runs on HTML/CSS/Javascript and is a useful tool for those who wish to experiment with multimedia with very little coding or game engine experience.

Below you will find some notes on the multimedia elements included the game and how they relate to the broader themes. You will also, most importantly, find a walkthrough. Intentionally or unintentionally, this game aligns with the oft-obtuse systems and gameplay of the decades of text adventure games before it. Call it a homage if you must. The walkthrough will assist you in reaching the ending of the game, although I encourage you to meander aimlessly first. Being able to meander is one of the great benefits of research-creation, after all.

I would say “have fun”, as I think all games deserve to be a bit fun, but instead I will say “have thoughts”; they can be good or bad, but as long as you are thinking—about the Anthropocene, about cultural memory, or just about how sometimes clicking links is fun—I will call this project a success.

Game Walkthrough

The Scrap Keeper

1) Go to Hanen and visit The Ruins on the old roads. Speak with The Traveller to obtain a drop of oil.
2) Open your map and go to Àndāzī.
    a. Visit the Town of Festivals to meet with The Pilot.
    b. Go to The Swallowed Beach and follow the prompts to obtain Plastic Iconography.
    c. Go to A Park for Hoodoos. You will empty the oil, and your log for One Last Drop of Oil will be complete.
3) Open your map and go to Ravaaga. Visit the Museum of Progress and enter The Machines of Industry wing. The Curator will give you a rusty key.
4) From Ravaaga, go to The Mines and meet with The Pilot. Follow the prompts to obtain Photos of Scars.
5) Go to Majaatl and from there enter The Contested Zone. Go further to the deforested clearing and take the old man's boat. You will head to the server farm and obtain The Obsolete Server Farm.
6) Go to Hanen and enter The Capital. Follow the source of the smog. With The Curator's key, you will be able to enter the factory. You will obtain The Machine That Remains.
7) The game will notify you that you have all five items. Click on the link in the notification message to finish the route.

The Solastalgic Poet

1) Open your map and go to Hanen.
    a. Visit The Capital and enter the house to obtain Relics of Illness.
    b. Visit Community Farms to obtain Taxidermy Cows.
    c. Visit the ruins and examine the architecture to find a poem. Look at the poem to start the quest for the anthologies item.
2) Go to Majaatl.
    a. Visit the Flooded Terrace and write the red sun haiku.
    b. Go to the River of Retellings and then the Floating Theatre. Watch the show and obtain A Dance for the Burdened.
3) Go to Àndāzī.
    a. Go to A Park for Hoodoos and then visit the Empty Gallery. You will automatically examine the red sun paintings on the wall. Head to The Artist's display and follow the prompts to obtain Empty Databases.
4) Go to Ravaaga.
    a. Enter the Museum of Progress and head to The Art of the Aftermath. Speak with The Artist to obtain the last item needed for Anthologies of the Red Sun.
5) The game will notify you that you have all five items. Click on the link in the notification message to finish the route.

The Eco Orator

1) Open your map and go to Majaatl.
    a. Speak with the woman at The Flooded Terrace.

b. Talk to your grandfather, who is in the deforested cleaning next to The Contested Zone.

c. Your grandfather can take you to the River of Retellings. From there, watch the poet perform at The Floating Theatre. Once you have done all three, you will obtain The Shapeshifting River.

2) Go to Hanen and visit Community Farms. You will obtain Tasting Trails.
3) Go to Ravaaga and visit The Mountain Peak. Follow all the links in the community centre and you will obtain The Collective Memory of the Mountain.
4) Go to Àndāzī and visit Town of Festivals. Go shopping to obtain Weaving Patterns.
5) To obtain Old Lines you must visit the following locations, even if you have unlocked them on other routes:
    a. The Mines, Museum of Progress, and The Mountain Peak in Ravaaga.
    b. The Capital, The Ruins, and Community Farms in Hanen.
    c. The Contested Zone, The River of Retellings, and The Flooded Terrace in Majaatl.
    d. The Swallowed Beach, A Park for Hoodoos, and Town of Festivals in Àndāzī.
6) The game will notify you that you have all five items. Click on the link in the notification message to finish the route.

The Archaeo Futurist

1) Open your map and go to Hanen. Take the old highway route. Examine the ruins and enter them. Speak with The Traveller. Once you are back outside, you will have obtained (Un)recognizable Ruins.
2) Open your map and go to Majaatl.

a. You will need to go to the Contested Zone and examine the dried herbs.
b. Return to Majaatl on your map and go to the river (River of Retellings). First, smell the flowers.
c. Then, return to the river and head to the Floating Theatre. Watch *Rituals for the Extinct*. When you have done all three things you will have obtained The Scent of an Extinct Flower.

3) Open your map and go to Ravaaga. Head to The Mines and follow the prompts. The game will notify you that you have obtained The Silurian Stratigraphic Sample once you are finished.
4) Return to Ravaaga and head to the mountain peak. Pick up the bead.
    a. Go to the museum and speak to The Curator. She will explain the bead to you and you will have finished Pleistocene-Oriented Programming.
5) Explore The Space Race wing of the museum. While there, you will obtain A Piece of Space Debris.
6) The game will notify you that you have all five items. Click on the link in the notification message to finish the route.

Other Tips

1) You should be able to play the routes in any order.
2) Once you have completed all four routes and deposited all twenty items, the game will prompt you to go to the ending sequence. The Solar Punks is the ending sequence and plays out in a fairly linear fashion.
3) The save function is in the header. You may save at any time.

4) The Traveller only gives two routes items but all four routes have unique dialogue.

Audiovisual and World-Building Materials

There were some audiovisual materials that were picked because they captured a generic and easily recognizable feeling that could be understood by the majority of readers, like scenes of snowy mountains and desert hoodoos. However, the examples and choices picked for specific reasons are listed below.

The world also began as a more in-depth endeavor, but most of that ended up being scrapped as I changed the format of the thesis. Originally, the narrative of each culture was to feature more prominently and the item descriptions would be mixed with fictional worldbuilding and academic scholarship. However, beta readers found it a bit too confusing to read so I ended up separating the two and keeping the worldbuilding elements more basic. Some of the background that didn't make it into the game is also explained below.

Majaatl/Eco Orator

Majaatl is loosely based on the tropical ecoregions of the world, which is why flooding is a predominant theme there. Like real life tropical regions, it has a higher rate of biodiversity than other climates.

Because Majaatl is the home of the Eco-Orator, it has more voice-acting and audio than the other routes. In the original worldbuilding, Majaatl was a culture with oral literature. In the final product that is reflected best in The Shapeshifting River, whose different stories are voice-acted even if they are also written down (since it is a text game, after all). The Collective

Memory of the Mountain and Constructed Eco(Tones) are also audio pieces put together. For the mountain, it is a combined soundscape of a recording from a mountain in France, the crushing of flower petals, wind chimes, and the Tibetan singing bowl drone that plays in the beginning and ending as well. For the Eco(Tones), the sounds that play are a close recording of ants moving on a dead tree, NASA's sonification of black hole data, and an Arduino project that makes sounds from plant vibrations.

Majaatl's imagery is from various rainforests, Venice, Bali, and Fenghuang County in China. These areas are all susceptible to flooding and other unpredictable climate changes, particularly due to global warming or destruction of local ecosystems. Bali in particular is also susceptible to being a trash dump for nations in the Global North, whether through tourism or the shipping of waste to Southeast Asian countries. It goes without saying that rainforests also suffer from deforestation, violence against Indigenous tribes, and a variety of other problems. The main soundscape that plays in Majaatl is a field recording taken from Reserva Nacional Tambopata in Peru, in the Amazon River Basin.

Àndāzī/Solastalgic Poet

Àndāzī is based on the arid and desert ecoregions of the world, and reflects themes of finding meaning in emptiness through the Solastalgic Poet's route.

The main soundscape in Àndāzī is a field recording from the Mojave Desert, which is a protected national park. The beach/ocean recording is from Hanakāpī'ai Beach, a popular but dangerous tourist spot in Hawai'i, and the market recording is from a market in Palestine. All of these areas have been affected by colonial violence and resource exploitation. While Àndāzī in

the game is not colonized, it does suffer from a reliance on tourist economies and foreign investment. The Mojave Desert, however, was chosen because it is a fairly well-protected ecoregion, reflected in A Park for Hoodoos (although the Mojave itself does not have hoodoos).

The imagery is taken mainly from the MENA area; the market picture is of a rug-seller in Marrakesh and the main picture is of a region in Saudi Arabia. I chose Marrakesh because in the game's narrative, Àndāzī is inundated with tourists and the markets create generic "traditional" products to appeal to them; Marrakesh is one of the most visited places in the MENA area, and in the picture, you can see a group of White tourists centered around the rug seller. The Saudi Arabia picture was very specifically chosen because of who created it. The picture was posted by what appears to be an official NEOM account on the stock image site Unsplash. NEOM is the pet project of Saudi Arabian prince Mohammed bin Salman. NEOM is meant to be a new futuristic city, and the caption of the image states that the area photographed will be part of NEOM's initiative to protect biodiversity in the area. However, anyone who has heard of NEOM has also heard about its violence towards the Indigenous Howeitat people and other violent acts (Gardner, 2020). In other words, it is best not to believe a word of the project. There is a worry in me that the desert in this picture, which very much appears to be taken by the project itself, will be replaced by a city built on violence in the next decade.

The other note for the Solastalgic-Poet route is A Dance for the Burdened. The images and gifs were taken from a variety of performances and groups, explained in the order they appear in the scene:

- *PAINTED*: A dance performance related to abandoned places and urbanization.

- Makuakāne: An Indigenous Hawai'ian dance group aiming to decolonize hula performance.
- *Crested Ibises*: A Chinese ballet that combines traditional Western and Chinese dance to tell the true story of China and Japan working together to stop the extinction of the Crested Ibis.
- Anthropocene Sculpture: An art project by Marcus Eriksen that requires hydraulics and manual labour (biking) to power a sculpture. The two gifs were taken from the making of video.
- *The Ways We Love and the Ways We Love Better—Monumental Movement Toward Being Future Being(s)*: An outdoor dance performance by Emily Johnson that invites the audience to participate in decolonization by planting tobacco seedlings.
- *Plastic Harvest*: A street dance performance by Jody Sperling with costumes made out of plastic waste.
- *Anthropocene: The Human Era*: A choose-your-own video and dance production put on by the Oxford Playhouse about the Anthropocene and fear for the future (unfortunately, no longer appears to be publicly available to play through).

All Indigenous performances were open to the general public and the images used were taken from media sites who uploaded them with permission of the performers. The audio re-uses the bowl drone that exists across all the sound in the game, plus highly-edited versions of percussive world music traditions: Irish dancing, a West African drum ensemble, and Chinese drums for a street performance.

Hanen/Scrap Keeper

Hanen is meant to represent the temperate river basins of the world, and reflects the rise of agriculture and industry in its history.

The picture of Hanen's capital is Manchester, which was chosen due to its status as arguably the first industrialized city in the world. The recording in the city is actually of a PA system in Shanghai. Shanghai is one of the top 20 polluted cities as of this writing. The recording was partially chosen for where it was recorded and the general eeriness the PA system's distorted recording added to the game. The factory soundscape was a recording from a factory in South America. Otherwise, the audiovisual material was taken from temperate zones such as Oregon (the recording) and Germany (the farm and field pictures). I think Hanen and Ravaaga contain the images most familiar to Western Canadian audiences.

Ravaaga/Archaeo Futurist

Ravaaga represents the colder continental and boreal climates of the world, as well as unique ecoregions in higher altitudes.

The main soundscape is a field recording in the Andes in Peru. The soundscape in the mines is simply a collection of sounds related to radiation and industry, such as a Geiger counter. A noteworthy image in Ravaaga is the building chosen for the museum, which is the Buzludhza Monument in Bulgaria. This building is currently a crumbling a monument to the futurist architecture of European Communist states, and there are also plans to turn it into a proper heritage site in order to preserve it (Buzludhza Monument, 2024). It felt like a fitting representation of the Museum of Progress, since it was meant to envision the future and yet is

mostly abandoned. I also added an image of the Athabasca Glacier, as it has been slowly melting due to climate change and is a much closer problem to us here in Edmonton than some of the environments in the other routes.

Ravaaga also has images of extraction pulled from stock photography and Canadian "Anthropocene" photographer Edward Burtynsky. The bead in the Archaeo Futurist's route is from a larger project called *Fossil Necklace* by artist Katie Paterson. Paterson's work focuses on deep time and *Fossil Necklace* is a series of beads made out of material formed from the Pre-Cambrian Era to now. The bead used for this project, based on Paterson's website, is one of the Pre-Cambrian ones. I would have used a Pleistocene one but Paterson's website appears to be missing a few images of the beads in the necklace and it is difficult to tell which one is which from the chart.

A note on languages

As mentioned, there was originally an intention to have the fictional worldbuilding be much more prominent in the project, including forcing my friends and family to read out constructed language scripts. This was unfortunately scrapped. However, I will share some brief notes on them since my sister, a linguist and speech pathologist, worked hard to help with them:

Haneni:

This language has a strict and limited vowel system, but more consonants than any of the other languages. It follows an SOV (Subject-Object-Verb) structure and requires extra grammar particles for marking each, which means that one could technically change the SOV

structure to emphasize one part of the phrase over the other. It is notable for having both /th/ noises in English, which are fairly rare phonemes in the grand scheme of real-world languages.

Majaatli:

This language differentiates between short and long vowels (as seen in Majaatl), and the /tl/ is pronounced similar to the /l/ sounds heard in Welsh and certain Nahuatl dialects. Because it was a language originally made for oral storytelling, it was meant to sound very musical; words are conjugated by changing or repeating the vowel sounds, like in Tagalog. It also follows a vowel harmony system like in Hungarian (that is, only certain vowels, based on their pronunciation, are allowed to be next to each other). I did not force my friends to learn this language for the spoken recordings because it is too dissimilar from English and the other languages my friends speak (and none of them are trained orators or readers of the International Phonetic Alphabet).

Àndāzī:

Àndāzī is actually a tonal language, but Twine doesn't play nice with diacritics in its coding so it is usually spelt as "Andazi" in the game to avoid messing up certain variables. Àndāzī is also a very musical language; it has three simple tones (high, neutral, low), no unvoiced consonants, and allows for the initial consonant clusters of /nd/ and /mb/ seen in many Bantu languages. This makes it sound very warm and rhythmic when spoken, but unfortunately there ended up being no spoken parts related to it.

Ravaagan:

Ravaagan also differentiates between short and long vowels, and is the opposite of Haneni in that it has a very extensive vowel inventory as well as diphthong (combined vowel) inventory. Its vowel system is most similar to Finno-Uralic languages, but Sámi languages in particular. English speakers who like fantasy novels might notice a similarity to Elvish because Tolkien also took inspiration from this language tree. It works a bit like Cree in the sense that it is very easy to come up with one giant and complex word through its conjugation and morphology system. You can see a small example of it when you view the pamphlet at the mountain community centre as the Eco Orator.

The Game

Item Descriptions, Definitions and Routes

Items in the game are specific to routes, but can be gathered in any order. The routes can also be played in any order with the exception of “The Solar Punks”, which is the ending route. While they are presented linearly here, they are meant to be read non-linearly and tied to the non-item text of the game itself. Each route begins with a brief introduction to the concepts found within the items. All routes have access to the main definitions below.

Cultural Memory

Cultural memory is defined in Assmann’s (2011) seminal work as a “connective structure” that combines “memory (or reference to the past), identity (or political imagination), and cultural continuity (or the formation of tradition)” (pg. 3). We are bound by our culture to this structure through “adherence to the same laws and values” and the “memory of a shared

past" (2011, pg. 3). Importantly, Assmann also calls cultural memory a mixing of "instruction and storytelling", which differentiates it from both history and collective memory (2011, pg. 3). Put simply, cultural memory can be thought of as shared cultural experiences between a group of people that shapes their view of their group's shared past, present, and potential future. These connective experiences create cultural knowledge through their linkage, and this knowledge has the potential for re-interpretation and revision as different people create different links and stories.

As such, cultural memory can provide an argumentative framework for how we narrativize shared human experience; what we choose as a symbol of collective identity, and how we link those symbols to create stories, creates a persuasive argument in how we interpret certain events. Thinking about cultural memory this way allows us to think of it in relation to collections and the Anthropocene; collections are ways of linking cultural information to create knowledge, and the Anthropocene is a shared human experience that impacts our cultural practices and understanding of the world.

Assman's definition of cultural memory has been explored in its relation to collective memory and collections as a whole. For example, Brockmeier (2002) explores the relationship of shared and individual memory, explaining that while individuals within the same culture can share some of the same frames of reference for remembering, "almost every individual develops a different combination of social frames of memory and, accordingly, remembers and forgets differently" (pg. 24). Brockmeier also emphasizes the importance of narrative in cultural memory, as Assmann does, but also highlights "forgetting" as part of the narrative function to explain how cultural memory can be deconstructed through a postmodern lens (2002, pg. 25).

Other “missing spaces” as part of cultural memory narratives have also been examined, such as Ryan’s (2010) concept of “mnemonic resistance”, wherein marginalized individuals and groups deconstruct and dominant cultural memory frameworks to “re-symbolize” cultural memories of power. Cultural memory as narrative has also been examined through Poole’s (2008) argument that cultural memory differs from history in that it is a first-person narrative that transmits social responsibilities and expectations onto the present ego of both the society and the individual. Regardless of who is doing the remembering, or the forgetting, the flux between collective and individual that constructs and deconstructs cultural memory, and creates its schemas, is impacted by media, or the means in which memory is disseminated (Shahzad, 2011).

If one were to attempt to synthesize these ideas, one might say that cultural memory can be thought of as a complex narrative that is continuously deconstructing and reconstructing itself as society, individuals, and means of knowledge production change; however, it is suffice to say that cultural memory is a complex phenomenon whose structure, in a very postmodern way, defies a rigid definition.

Anthropocene

The Anthropocene is defined by Oxford as “the epoch of geological time during which human activity is considered to be the dominant influence on the environment, climate, and ecology of the earth, a formal chrono-stratigraphic unit with a base which has been tentatively defined as the mid-twentieth century” (OED, 2022, def. 1). Using the Anthropocene as a framing narrative is meant to center “concerns rethinking the relation between humans and the environment, their interactions, interconnections and interdependence” (Lucci, 2018, pg. 2). In

cultural heritage, Anthropocene studies focus on adapting cultural practices to preserve the environment (Brewer & Riede, 2018), natural heritage as part of, rather than separate from, cultural heritage (Harrison, 2015), and the cultural practices, information, and knowledge that may disappear due to climate change and related practices like industrialization and colonialism (Brewer & Riede, 2018, pg. 559-561; Lucci, 2018, pg. 2).

We as humans often rely on specific geospatial, ecological, and otherwise natural and liminal types of information not as easily collected by institutions, and it is for this reason this thesis intends to examine collecting cultural memories as they relate to the Anthropocene. Other types of cultural heritage impacted by the Anthropocene are also "non-collectable" by Buckland's (1991) information-as-thing criteria, such as architectural, contemporary urban, and archaeological sites (Orr et. al, 2021, pg. 447). In other words, utilizing the Anthropocene as a thematic frame allows us to ask what cultural memories are most at risk in our modern era, and what different schemas of collections—as a form of knowledge creation and dissemination—can do to preserve these cultural memories.

Collecting

Typically, when one thinks of collecting in information studies, they think about collection development in cultural memory institutions—although cultural memory is present outside the institution as well. In the same way, the act of collecting extends far beyond institutions. Elsner & Cardinal (1994) claim collecting is a "narrative of how human beings have striven to accommodate, to appropriate and to extend the taxonomies and systems of knowledge they have inherited"; that is, collecting can be a natural extension of creating knowledge from cultural memory on both an individual and collective scale (pg. 2).

One way collecting cultural memory might be distinguished from cultural memory itself is that “collecting is obsessed with boundaries” and “dictates its own terms for all additions, which change the shape and character of the collection” (Morgan, 2016, pg. 375). A collection of cultural memories must therefore define itself along a theme even as it dynamically grows. Different memory institutions, for instance, have different boundaries; galleries, libraries, archives, and museums are beholden to specific types of services and collection materials that are separate from one another. Regardless of who is doing it, collecting—and by extension what is being collected—is an expression of the values prioritized by who or what is doing the collecting, what knowledge is derived from it, and what boundaries frame this knowledge.

It is important to understand how collecting places these boundaries on cultural memory, especially as cultural memory institutions are products of a Western, colonial, patriarchal perspective on collecting. Early anthropology divorced cultural memory objects from their proper contexts (Dillion, 2019, pg. 258), creating a space in the institution of destruction, reconstruction, and deconstruction (Kaimal, 2022, pg. 5). Part of this boundary is determined by what can be collected; physical objects are prioritized even though other forms of cultural information are equally important (Buckland, 1991, pg. 356).

Modern memory collections attempt to account for embodied knowledge, intangible heritage, and digital collections and knowledge (Counsell & Mock, 2009; Rylance, 2006; Hamid, 1998). This thesis will focus on the types of cultural memory not easily captured by collections in an attempt to think about both how cultural memory is disseminated and how the Anthropocene permeates every type of memory practice—even those that are difficult to capture in our current conception of a memory collection.

The Scrap Keeper's Route

The Anthropocene has such a reach on all aspects of our current cultural productions that Haraway (2015) has termed it to be "Anthropocene, Plantationocene, and Capitalocene"—or, to put them all together, Chthulucene (pg. 160). The Chthulucene is a representation of the Anthropocene not just as omnipotent, but as a warning of how "nature cannot work much longer to sustain extraction and production in and of the contemporary world because most of the reserves of the earth have been drained, burned, depleted, poisoned, exterminated, and otherwise exhausted" (Haraway, pg. 160). Haraway urges us to make kin with our nonhuman and more-than-human world to avoid the "immense irreversible destruction" we are headed towards (pg. 161).

Much of this destruction is in the form of discarded objects, scars of extraction, and rapid accumulation of waste as a result of focusing on production over sustainability. If we consider that the Anthropocene is as embedded in our world as Haraway claims, then why do we choose to ignore this trash in cultural memory? Memory scholars argue that memory must reshape itself around the byproducts of such a Chthulucene, whether it be through turning extraction sites into places of memory (LeCain, 2014), acknowledging the insidious but invisible infrastructure of petroculture (Barrett et. al, 2014), or understanding who owns internet infrastructure versus who deals with the electronic waste it creates (Greene, 2022).

Acknowledging waste as something that can hold memory, then, also acknowledges waste as an impact on cultural memory and traditional practices of passing it down. Things like plastic and nuclear waste long outlast a human lifespan; they must be acknowledged not just as a destructive force on the environment, but as one of the longest lasting memory objects we

create. Museums and other cultural memory institutions do not tend to highlight waste in their memory narratives—but, as it becomes one of our most prolific cultural productions, it is worth considering what memory narratives we want to shape around our waste.

The Obsolete Server Farm

The issue of data centers in the Anthropocene is twofold; first, there is the impact of data centers on the environment, which are often made invisible to consumers and visitors in the digital realm. The second factor is the social inequalities of how data centers are made—those who benefit most from online infrastructures are often not the same ones working in silicone factories and clearing land for data centers.

Concerning the first issue, the data center's greatest threat to natural heritage is the production of carbon. Data centers run on electricity; not just electricity for the task of data processing, but electricity for keeping the hardware cool as they are pushed to their limit. Monserrate (2022) explains that cooling systems strain all aspects of the environment; from being run on a "dirty" electric grid where electricity is produced by gas and oil, or rerouting rivers as part of cooling systems in water-insecure areas, data centers shape the climate of the areas they are built in (para. 7-9). As the demand for computational power grows, old hardware is discarded in favor of newer models; such a practice has made "embodied hardware emissions", or the emissions of producing physical electronic waste, grow by 6 times over in a period of just two years (Gupta et. al, 2022, pg. 38).

Who, then, is benefitting from these polluting data factories in the global economy? In general, it is the Global North, where the majority of digital production and headquarters for

tech companies lie. These West-centric tech companies become “internet landlords” through their ownership of the physical infrastructure required to “run” the internet (Greene 2022). In contrast, these same tech companies build physical components for data centers in the Global South, where labour is cheap and exploitable. The trash, too, is sent to the south, creating significant health and environmental risks for those who live there; most of the quickly disposed of metal is placed in “e-waste graveyards” without safely disposing of toxic and radioactive elements in the now-obsolete hardware (Monserrate, 2022, para. 26).

Such inequality begs the question: how ethical is the production of digital cultural memory? When the physical nature of data processing is ignored, digital realizations of cultural memory can often provide a more equitable and accessible version of cultural memory; Cardoni et. al (2023) explain that the digital ecosystem allows for a much more diverse community to choose “what to preserve and enhance from its past” (pg. 359). Often this means community archives for marginalized groups whose culture is not so easily captured in traditional archives, or other transmissions of living culture hard to capture and disseminate across non-digital formats, can become realized among the mass of digital production, even if they are not the dominant voice. These archives exist specifically because the mass amounts of data means that even marginalized data can reach out across the expanse of the internet to create meaningful connections.

However, Cardoni et. al (2023) also explain that our current digital system, which creates cultural memory archives across social media, apps, and blogs, “has brought us to the age of the zettabyte, in which we are inundated with data” (pg. 356). Cultural memory is not only about remembering; it is also about forgetting. In the face of so much raw data, and so much raw

potential, will the digital community bother remembering the physical residue of digital data production? Or is the environmental impact of data processing conveniently forgotten, left in the physical realm where already marginalized groups are left to process its waste? There is no doubt that data processing is a crucial component to digital cultural memory; however, if the means of data production are forgotten in the dominant, collective narrative of digital systems, then one must question the convenient censorship of a cultural memory system that ignores its own methods of meaning-making.

The Machine that Remains

In the Industrial Revolution, machines became the dominant mode of cultural production—if not in quality, then in quantity. The machine itself, however, oft becomes forgotten for the sake of what it produces. As the Anthropocene creates more spaces for machines through industrialization, extraction, and mass production, we must look at how forgotten machines need to be remembered as part of the mnemonic narrative of the oft-marginalized people who operate them.

Due in part to cultural dominance, there are some machines who enjoy better signifier status in memory narratives than others. Museums with machinery and technological objects in their collections often paint a narrative of innovation, progress, and the future (Alberti, 2022, pg. 19). These publicized machines are tied to innovations like scientific equipment, medical breakthroughs, and advances in communication. But, as with many museum collections, the museum's role as a determinator of cultural dominance ignores the marginalized narratives also attached to these machines.

What happens when we forget “marginalized” machinery narratives—the ones that did not bring innovation or progress but discrimination and exploitative labour? Even machines glorified as cultural memory objects hide marginalized narratives, like producers of the steam engine being associated with the trans-Atlantic slave trade or advancements in textile machines being the result of slave labour (Alberti, pg. 218-221). Coffee (2021) highlights factory machinery as the onset of Anthropocenic practices, giving the case study of an entire town built to make space for machinery and extraction—the only “human” element women and previously enslaved peoples, or “workers familiar with tedious tasks and paternal authority, whose current economic conditions would encourage them to take up factory work” (pg. 26). It is only here, in the industrial realm of mass production and marginalized labour, that the machine is suddenly a memory object worth forgetting. The tacit skills used by the operators of these forgotten machines tend to be forgotten as well (Carty-Hornsby, 2021); when the machine is discarded for the sake of innovation, so too is the human labour its successes were built on.

Machines are also associated with thinking about the Other—the groups of people who are forced to resist dominant modes of memory simply because the narrative already excludes them, or paints them in strange and exoticized lights. Early examples include the automata created for theatre and ballet in mid-19th century Europe; the mechanical beings were often created to look like Black or Orientalist stereotypes to emphasize their “dehumanized” physicality (Bellow, 2022. Pg. 402; 410). A more modern form of Othering and machinery is the use of androids, cyborgs, and robots in science fiction as stand-ins for the struggles of the marginalized. These modern conceptions are painted in more sympathetic lights, bringing to

attention the ties not just between machine and human, but marginalized groups and exploitative, tedious, mechanical, repetitive labour.

These machines are, of course, products of capitalist thought and innovation that also manifest the Anthropocene. But in the words of Haraway (2016): "it might be the unnatural cyborg women making chips in Asia and spiral dancing in Santa Rita Jail whose constructed unities will guide effective oppositional strategies" (pg. 14). To understand that factory machines can be powerful symbols for recognizing and pushing back against erasure of minority labour is also to push back against marginalization of the groups operating them. Indeed, Palatinus (2017) argues that by emphasizing the role of the artificial both against and within the anthropocentric views in the Anthropocene, we can address "domination and responsibility in a progressive way"; or, look at ourselves "not only against this Otherness, but whose definition this Otherness forms an integral part of, whose definition this Otherness is a condition of" (section 3).

Recognizing the role of machine in both being an Other, representing Otherness, or being forgotten because it was associated with that Otherness is a step towards recognizing marginalized narratives both within the Anthropocene and cultural memory—dissolving the idea of Otherness while still recognizing its role in shaping dominant, mechanical culture. To associate the machine with the human behind it, and to remember the machines associated with those forcibly othered by dominant memory narratives or the capitalist practices creating machines, is to resist the factors of marginalization created by the Anthropocene.

Plastic Iconography

A word so often associated with plastic is “immortality”. Plastic, after all, can take upwards of a thousand years to degrade—but more important than that, we produce over 400 million tons a year, most of which is thrown away and will not biodegrade without proper care (Chamas et. al, 2020). The near-immortality and mass-production of plastic means it has infiltrated every aspect of human culture; even, and perhaps especially, the spiritual aspects.

Skrimshire & Bedford-Strohm (2018) ties immortality, religion, and the Anthropocene together by examining our waste materials in deep time juxtaposed against Christian eschatological memory, or a belief that “the goodness of corporeal existence must be preserved in eternity, that the perishable will become imperishable” (pg. 151). Here, the immortality of waste—plastic, nuclear, or otherwise—is tied to divine beliefs of eternity and the importance of temporal life becoming beyond temporal in the universe. While Skrimshire & Bedford-Strohm believes “the Anthropocene as a ‘scar,’ archive, or record of humanity might yet be seen as a moral prompt” because it is an eternal reminder of sin rather than an eternal absolution of it, it also shows how religion’s obsession with eternity can bring attention to Anthropocenic waste practices in cultural memory (pg. 153).

Plastic waste in particular has a peculiar relationship with cultural memory and the divine. McHugh (2014) points out that the use of camphor in plastic led to the mass-production of synthetic camphor, changing the “mode of production of camphor from a system of forest production to a modern, industrial, chemical process” in sacred Hindu rites (pg. 33). However, the importance of camphor in Hindu cultural memory has made synthetic camphor “a ubiquitous and supposedly traditional smell of Hinduism” because “its familiar blaze and smell

evoke devotional emotions" (McHugh, 2014, pg. 47; Dempsey, 2006, qtd. In McHugh, pg. 47). Plastic waste is also an important form of religious materialism for practicing Buddhists in Sikkim, India; plastic objects are used as ritual objects, storage for sacred materials, and creating long-lasting iconographic vessels for spiritual figures (Brox, 2021; Holmes-Tagchungdarpa, 2023). That is, the immortality of plastic production actually becomes intertwined with important concepts of immortality in spiritual and divine cultural memory practices.

While natural stewardship of nature-as-divine-creation is perhaps the most obvious way religion and resistance of the Anthropocene manifest, few think of recycling and repurposing plastic as a form of religious stewardship and reality. The particular way Sikkimese Buddhists use plastic aligns with McKim's (2013) argument that all religions in the Anthropocene have "elements that are friendly to good planetary citizenship", a list of which "can be extended more or less indefinitely" due to numerous traditions related to natural stewardship and the acknowledgement of the material world (pg. 259). Plate argues that "the body pervades all aspects of religion" and we are indeed embodied in a material realm of plastic waste (pg. 173). Brox (2021) takes Plate's concept of embodied materiality and claims that the Sikkimese Buddhist acknowledgement of living in a plastic world actually prevents plastic from becoming a forgotten waste material because it is incorporated into cultural practices and traditional memory narratives (pg. 105).

As such, acknowledging plastic waste as a form of memory object is also a way to acknowledge the reality of near-immortal material waste in the Anthropocene. To acknowledge the eternal memory of waste is to posit "new ways forward in the Anthropocene where waste can be reborn into new forms of use, rather than rotting away as 'zombie rubbish' in the

landscape" (Holmes-Tagchungdarpa, 2023, g. 9). By tying this acknowledgement to traditional memories and associations of eternity, plastic waste is recognized as a deep time object that must be dealt with and remembered in the present.

One Last Drop of Oil

In the Anthropocene, finite resources and scarcity economics determine value. Perhaps one of the greatest symbols of the Anthropocene is oil. When thinking about the social, political, and economic impact of oil, we must also consider how global extraction practices in general disrupt cultural memory schemas—in particular those of the colonized, repressed, and otherwise negatively affected by the ties between extraction and repression.

One of the most dominant examples of petro-culture and disruption is Indigenous sovereignty, resistance, and oil infrastructure in the Americas. Nick Estes, a member of the Lower Brule Sioux Tribe Nation and a political activist, highlights the difference between colonial memory and Indigenous memory in regards to oil: "in the public memory of the Wounded Knee occupation, it was the end of a sort of militant Red Power movement. In fact, according to the memory of the participants, it was just the beginning of something greater" and would go on to inform resistance to extraction practices on Indigenous lands (Barsamian, 2017, para. 3). In this case, oil was unable to disrupt the mnemonic resistance of the cultures involved. However, what would happen if extraction was tied to sovereignty? Strønen (2017) argues Chávez's political narrative in Venezuela was a reshaping of marginalized identity—he himself having Black and Indigenous heritage—through funding resistance to American interference by placing oil in the hands of "the people", making oil wealth "a material resource, a social property and a cultural imagery" that irrevocably tied political resistance narratives to greed and corruption (pg. 8).

Here, a finite resource becomes embedded in a longer tradition of culture, intertwining itself with both the oppressor and resistor due to colonial notions of power.

Oil has also disrupted memory practices of resilience in Islamic tradition. Chaturvedi & Montoya (2013) found that although "larger percentages of women in the labor force yields greater change in political rights", economies with "higher oil and gas revenues per capita yield less change or even regression in political rights" concerning gender (pg. 611). The same study found that even fundamentalist regimes do not regress cultural changes in the same way (Chaturvedi & Montoya, 2013). However, this is not to say that religious fundamentalism should be considered separate from oil; Ali A. Allawi argues that globalized economies and extraction practices disrupt "the unity of Islamic civilization over a vast territory and across a multiplicity of cultures and peoples" specifically by decoupling traditional syntheses of power and spirituality to create fundamentalism (Meyer, 2009, para. 31). The spiritual unity naturally promoted by traditional Islamic beliefs is indeed a potential way to mitigate anthropocentrism regarding environmental disasters (El-Sherbini et. al, 2023), but modern oil economies seem to have a disrupting factor on traditional memory and spirituality practices that would provide said mitigation. Petro-culture appears to both intertwine with tradition and then overwrite it, forcing a disjointed memory practice to emerge.

Oil culture is then a significant, albeit negative factor, on cultural memory. It both disrupts mnemonic resilience while providing an enemy to rebel against. Estes argues that oil is representative of other finite resources because what matters is not oil, but extraction culture in general (Barsamian, 2023, para. 23). What is needed is not to destroy oil, but to recognize it as a narrative signifier of a larger disruption of traditional ways of knowing. Rethinking the ways oil is

represented in cultural memory may have the potential to change not just how oil affects cultural memory, but how finite resources affect cultural memory in general. To do so requires thinking of oil as a complex memory object in and of itself to gain a "nuanced understanding of social and political processes emerging from resource extraction" (Strønen, 2017, pg. 319). When oil is understood as a player in shaping cultural memory, only then can it be fully resisted to create effective resistance movements for a carbon-free future (Barsamian, 2023, para. 30).

Photos of Scars

While artists have intentionally tried to capture the grandeur of landscapes—or intentionally abstracted it, depending on the aesthetic tradition—the scale of our natural world tends to elude static media. The same is true of modern, Anthropocene landscapes, wherein the scale of mountains are traded for the depth of mining pits and the vastness of the ocean is replaced by the trash islands floating within them. By examining how landscape aesthetics act as transmissions of memory and applying them to our human-made landscapes, we are forced to confront the sheer scale of human impact on the natural world.

Unlike conceptions of landscapes captured in, say, natural waypoints and sacred sites, landscape painting and photography forces an anthropocentric gaze onto the landscape. Lee (2015) highlights how the Anthropocenic gaze, specifically, can be found in Song dynasty paintings that were commissioned by the court to legitimize their razing of the countryside; paintings which positioned extraction practices and large-scale agriculture in the same perspective as paintings depicting harmony with the natural world (pg. 143-145). Anthropocentrism is a common theme in European art as well, where depictions of the sky are

juxtaposed against cityscapes in *The Starry Night* (1889) and *View of Toledo* (ca. 1600), or the human-centered mountain view in *Wanderer Above the Sea of Fog* (1818).

Debate about the human gaze in landscape art increased as photography became the main medium for capturing them. MacDonald (2021) argues that because human senses and aesthetics privilege the "visible", capturing the scale of human activity in landscape photography can make visible the "invisible, or 'hyperobjects', impossible to see all at once, or unfolding over long periods of time" (pg. 23). Kover (2014) also states that by evoking the sublime aesthetics of landscape paintings, Anthropocene photography can force humanity to confront "our contemporary ambiguous discomfort with and attraction to modernity" (pg. 128). Essentially, by forcing humanity to appear as a subject only through our destruction of our world—making visible those extraction sites that are simply impossible to understand without aerial photography techniques—we are forced to confront the empty and carved out spaces that will exist long after we are gone.

Sterling (2014) further explains materiality in memory and photography, claiming that the complex processes needed to create landscape photographs, as well as their ability to be circulated within archives, allow for us to use the landscape photograph as a way of studying the interrelations between "social relations, human subjectivity and the environment" (pg. 128). This type of heritage photography forces the human to find themselves in what LeCain (2014) calls the complex of material memory objects that make toxic waste and extractions sites a place for cultural memory, whether it be through physical visits, exhibitions, or indeed, photography (pg. 212).

The Anthropocenic landscape photograph, then, is a way of combining human subjectivity in landscape aesthetics with the acknowledgement of human destruction on a scale so frightfully sublime it cannot be captured by other means. Extraction sites will exist long after humans are gone, and can of course be visited if one is brave enough, but the photography of them forces them to be connected to the concepts of landscape art, photography-as-memory in archives, and how we distribute and share knowledge of the Anthropocene to force its consequences to the forefront of cultural memory.

The Solastalgic Poet's Route

In cultural memory, trauma often manifests as a form of forgetting; Brockmeier (2002) explains that a place for remembering is also a place of forgetting, and the interplay between the two creates a mnemonic space "which the various time orders of past and present are continuously recombined" (pg. 37). This space is not just individual but collective, and creates a formless function in memory that affects how a group processes what is and is not part of their cultural memory narrative. Brockmeier specifically highlights an empty memorial meant to represent the Holocaust as a metaphor for how trauma and forgetting intertwine (pg. 31).

In Anthropocene art movements, the feeling of "solastalgia", or the distress and longing related to rapidly changing climates and environments, pervades multiple mediums as a way of processing trauma and collective mourning (Bogard, 2023, pg. xxi). Eco-poetry, eco-art, and eco-performance show that what might become the new space of interplay for remembering and absence is products of solastalgia. Part of this mass-production of solastalgic art is because of the growing recognition of loss, extinction, and irreparable change in the Anthropocene.

However, solastalgic art is also an awareness of "interconnectedness" not just to other humans, but nonhuman lives (Martínez Serrano & Gámez-Fernández, 2021, pg. 6). Eco-art is almost a form of mnemonic resilience because the global space it resides in ensures every counter-cultural narrative against the Anthropocene, every loss experienced in a global world, is heard at least once. Much like Brockmeier's Holocaust memorial, the collaborative space of eco-art becomes a political act that ensures loss is not only felt but heard, as explored in Kallis' (2014) seminal work *Common Threads: Weaving Community Through Collaborative Eco-Art*.

When thinking about trauma narratives in the Anthropocene, then, it is important to explore not just what kind of trauma the Anthropocene produces, but what artists and art collectives produce in response to a dominant cultural narrative of production for industry's sake, rather than production for art's sake.

Relics of Illness

Physical sickness permeates human culture and consciousness, ravaging first through the body, then in the aftereffects as our fears of bacteria, viruses, and other threats to health are fuelled by the experience of being sick. On the collective level, we have the pandemic: waves of sickness that trigger fear and resilience on a global scale. Responses to sickness, and therefore responses to pandemics, become cultural memory through shared and empathetic trauma of illness. Edvard Munch's two paintings—*Self-Portrait with the Spanish Flu* (1919) and *Self-Portrait After the Spanish Flu* (1919)—highlight this phenomenon. By the time of their conception, Munch had already developed a distinct way of portraying fear and trauma from his own self-conscious as well as become popular in both art circles and the general public. The juxtaposition

created by the paintings of his own experience with the Spanish flu was thus one that resonated deeply, and so the paintings entered symbolic status within cultural memory of the pandemic.

Munch's paintings were not the only art situated around the flu—John Singer Sargent's *The Interior of a Hospital Tent* (1918) and Egon Schiele's *Gustav Klimt on his Death Bed* (1918) come to mind. But one of the crucial modes of cultural production in pandemics is not a famous artist's work, but the production of medical necessities and everyday accounts of pandemic living. And yet, despite these products of illness, pandemics remain poorly constructed in cultural memory "despite the extreme loss of life associated with them and their long-term impact on the economy and society" (Öner et. al, 2023, pg. 730). These "everyday" collections of illness are rare because of trauma; the reason the Spanish flu is more easily represented in a few paintings than in the memoirs of the many who lived through it is because "both writers and readers, individuals and society, got trapped in a vicious cycle of repression, forgetting and unconscious re-enactment of trauma" (Das, 2022, pg. 1368). There are few traces left of illness in memory, and those that do exist are the empty spaces that trauma has deliberately forgotten.

Why, then, is the memory of illness important to consider in the Anthropocene, when it does not seem to be collectively remembered under "normal" circumstances? It is because human-engineered climate change directly contributes to increased illness and disease; climate change has been proven, through rising global temperatures, to "increase the rate of reproduction of parasites and other microbial pathogens by providing a suitable breeding ground and gradually elevating the risk of transmission", particularly in areas where these parasites once could not live (Akhtar & Roth, pg. 1054). For example, tropical and equatorial illnesses have begun reaching into more temperate zones, and the study of these long-known-

about diseases have suddenly driven up mass-research from institutions in temperate climates, despite the tropical zones they originated from still being at greater risk of infection (Van de Vuurst & Escobar, 2023, pg. 7). That is, there is almost a fear-driven instinct to the research: fear that diseases once only for the "have-nots" are suddenly the problem of the "haves". Other illnesses, such as respiratory infections and cardiovascular issues from pollution, lowered air quality, and increase in dust storms in more arid regions, are also growing consequences of the Anthropocene becoming less "local" and more global (Akasha et. al, 2023; Khammar et. al, 2023; Syed et. al, 2023). The Anthropocene, then, forces illness to the forefront of cultural uncertainties.

As illness becomes a global anthropocenic terror, it is more important than ever to consider how the shared experience of illness—through a pandemic or otherwise—is both remembered and forgotten. When fear overtakes memory and causes forgetting, Das (2022) argues that new pandemics reawake trauma—but also that this trauma can then be mitigated by advances in medicine and other social factors that influence the outcome of the new pandemic (pg. 1371). Because pandemics also alter the ability of gathering and how stories are shared in cultural memory, recalling also works as a strategy when it recalls previous collective strategies for working together in times of trauma and resilience (Zaretsky 2023). Trauma related to illness and pandemics must therefore be recalled and mitigated through a hopeful lens as we are faced with increasing infection rates and climate-related diseases. Certain projects of the COVID-19 pandemic have attempted to collect and reinforce narratives of empathy and togetherness to avoid forgetting; for instance, the Smithsonian's collection of

masks from everyday people of diverse backgrounds, or the multitude of fictional story collections written from isolation meant to speak to an empathetic audience (Däwes, 2022).

Illness, and the collective memory projects associated with it, illustrate an important concept in the Anthropocene: how does one become resilient against a growing, every day trauma? As the risk of pandemics become more commonplace, and localized illnesses become global threats, one must consider how remembering everyday responses to illness—through paintings, or masks, or simply individual thoughts—must be used as a form of mitigation in cultural memory, rather than something to be forgotten.

Taxidermy Cows

Taxidermy is normally found in the realm of natural museums and scientific observation. But there are also the so-called "rogue taxidermists", who "communicate self-reflexivity on the status of the (dead) body in art" and use taxidermy, in part, to "express the pressing issues that continue to harm nonhuman animals in the present day" (Niittynen, 2022, pg. 88). In particular, extinction of both human and nonhuman ways of being are a pressing matter in taxidermy art.

It is first important to note that our modern conception of taxidermy, like many natural history and museum practices that developed in the eighteenth century, emerged from Western colonial projects and exoticization of the Other (Niittynen, 2022, pg. 89-90). But taxidermy, particularly rogue taxidermy, can turn exotic fascination into somber reflection; the Bristol Museum arranged its extinct and endangered taxidermy animals with black veils to call attention to the sixth mass extinction event (O'Key, 2021). Such a display connects taxidermy to the larger field of extinction mourning narratives in cultural memory, including those of

Indigenous and Aboriginal cultures (de Massol de Rebetz, 2020, pg. 881-883). Instead of seeing taxidermy solely as a display of the Western colonial or scientific project, we can recontextualize it as a form of art in the Anthropocene.

Taxidermy is a useful art form in the Anthropocene due to its complex relation with death and immortality. When a rogue taxidermist creates a taxidermy sculpture out of plushies, waste objects, vegan materials, or patchwork animal parts, the sculpture calls to attention its own explicit fakery of a life once lived—an illusion of life filtered by the "fantastical beliefs" of the anthropogenic view of prehuman and nonhuman lives (Nittynen, 2022, pg. 98). That is, taxidermy-as-art draws attention to its own nature as a facsimile to force us to contemplate why nonhuman life is lost and the anthropocentric way we reconstruct the life-narrative of nonhumans. It also asks how life is immortalized when it no longer lives, provoking a "dynamic between mourning and action which attempts to represent and counter the loss of extinction" (O'Key, 2021, pg. 644-645).

Displayed as memory objects of life, loss, and legacy, a series of taxidermy sculptures "permits for eco-cosmopolitan grief to be expressed and performed" as part of a "memory activism framework" (de Massol de Rebetz, 2020, pg. 880). The intentional lie of a rogue taxidermy sculpture, in particular, forces a mournful contemplation of how nonhuman lives are perceived in the Anthropocene. Taxidermy, when conceived of as a fantastical, story-provoking practice for the mourning, allows a re-shaping of the narrative surrounding the value of nonhuman life.

A Dance for the Burdened

A term often applied to Anthropocene artistry is solastalgia: "The distress caused by environmental change; the homesickness we feel while still at home; the lived experience of the desolation of a much-loved landscape" (Bogard, 2023, pg. xxi). In summary, solastagia is the complex embodiment of environmental loss and uncertain climate change. When discussing embodied feelings in cultural memory, it is important to turn to forms of art with an inherently embodied way of passing down memory.

Performance arts are part of a larger group of cultural practices where "the greater the mediation of the performance, the greater the disembodiment of the performance" (Cushman & Ghosh, 2012 pg. 269). That is, some methods of passing down cultural memories are so embodied by the performer, the spatiotemporal setting of the performance, and the role of the spectators, that it is difficult to mediate them into other forms. Embodied art is a way to create "spontaneous expressions of love, joy, reverence, sadness and so on", whereas solastalgia offers a stage to "to resist disillusionment, exhaustion, or apathy" towards climate change by allowing ourselves to feel (Cushman & Ghosh, pg. 270; Bogard, 2023, pg. xxiii). Combining the two—performance and feelings—thus offers a unique way for embodied art to mitigate climate trauma.

In particular, solastalgia performances offer a liminal space "that is not fixed on human presences and mimetic acts but togetherness, community, and kinship beyond the anthropocentric paradigm" due to the abilities of the performers and performance space to take on aspects of nonhuman concepts, decentering the human while still acknowledging human presence (Wehren, 2022, pg. 130). Embodied art, in part due to its manifestation as a

communal art in many cultures, allows a "better understand our collective fate and our connected response to a disappearing world" (Bogard, 2023, pg. xxiv). There is a certain connectedness—between the physical effects of the Anthropocene, the body within the Anthropocene, and the feelings surrounding both—that is achievable by solastalgia performance and embodiment.

While "feelings" may seem too vague for mitigating climate change, it is important to note that feelings are universal across cultures, and thus offer a more global connectedness that can than be localized and specialized to specific cultures. Whether it is asking how physical presence is used to embody both feelings and the environmental crisis (Haworth, 2023), representing changing climates in sound art (Wehren, 2022), or using practices from dance to center embodiment within ocean climate research (Shukla, 2023), performance art can offer a unique form of mediating memories of climate change and strengthening the emotion needed to combat the trauma of environmental loss.

Anthologies of the Red Sun

Alice and Antius (2021, Ingram & Tosswill) is a speculative fiction, collaborative artbook based on the modern climate crisis. The book uses poems, art prints, and mythology to depict a world that examines eternity and ecological uncertainty in equal measure through the eyes of a couple. This juxtaposition reveals the main theme of the book: how do you navigate climate change in act of togetherness?

This project is but one of many art pieces asking the same question. It is specifically the unknown future of climate change that provokes so much speculation across cultures and art

mediums, offering a rich environment for collaboration and solidarity. While Alice and Antius is a quietly made production—only two contributors, and self-published—it speaks to and represents these larger themes of collaboration, concern, and climate change as an artistic movement. Environmental aesthetics have existed long before the generally-accepted start of the Anthropocene, but Anthropocenic environmental art moves away from the human self within nature and introduces themes of decentering the self in order to move "towards a view of human beings within the larger context of interconnectedness" in a globalized, industrialized world (Martínez Serrano & Gámez-Fernández, 2021, pg. 6). This interconnectedness includes not just nonhuman entities, but the relationships between various human communities.

Sánchez-Pardo (2021) argues that this dissolution of the self in modern eco-art "develops multiple senses of locality and care", whereas Kallis (2014) sees communal eco-art, specifically, as a way for artists to be "connectors between the silos of different disciplines" (pg. 113; pg. 5). Perhaps the largest example of this is Peter Rutledge Koch's *Extraction: Art on the Edge of the Abyss* (2021) project, which took place across four continents, multiple languages and disciplines, and was meant to draw attention to both local and global practices concerning "the metastatic growth of extractive industry" (Koch, 2021, para. 13). That is, modern eco-art is moving towards both locality and global connectedness; how industry in one place affects another's ecosystem, or how interdisciplinary and communal thinking is needed to advocate for sustainable practices. These "multiple senses of locality" suggest a recognition of shared trauma and fear related to environmental destruction, even as it causes different affects on both an individual and communal level.

The question then becomes how collaborative art affects cultural memory, particularly in regards to trauma and the uncertainty of the future. One could argue these modern eco-art practices are simply the dichotomy between individual memory and collective memory played out on a larger level; between local cultural memory and global cultural memory, a result of the Earth-wide impacts of the Anthropocene on collective thought, where collaboration is required for creating equally diverse and connected memory objects. Indeed, Kester (2011) argues that the move towards collaborative art is a result of using art as sociopolitical activism, and that this increased connectivity dissolves the traditional idea of the artist as singular entity presenting a finished piece to an audience, instead creating a participatory movement of resistance that opens space for "new stories and new visions for the future" (pg. 1-5, pg. 6). Such wording suggests that collaborative eco-art—that which considers other eco-localities and interdisciplinary environmental thinking—is actually a form of diverse mnemonic resistance, reproduced in various cultural groups and mediums of art.

So, whether it is the smallest number of possible collaborators, as done in *Alice and Antius*, or a global-spanning project like *Extraction*, there seems to be a recognition that ecological uncertainty is most safely explored in collaborative aesthetics. The ability of collaborative eco-art to speak to both local and global communities, the human and nonhuman, the artist and the scientist, suggests that it is a successful form of cultural memory in the sense that it provides resilience against an uncertain future by drawing on a vast array of different mnemonic traditions.

Empty Databases

Digital memory is often thought of as permanent—but what if all digital traces are deliberately erased? The act of digital erasure is explored the *Nier* series of video games, where players can only "win" the game by erasing their stored data. This example turns the notion of permanent digital information on its head and brings to attention that it's not just saving, but erasing, that is a choice enabled or disabled by the systems we use to store digital memory.

The database, as a digital format, is a well-cemented format in memory: memory institutions went from card catalogues to digital databases; hierarchal and relational data between memory objects are written into database structures; most modern databases have a recall function that brings forth stored knowledge. But databases can also be altered, their contents deleted, their relational structures exclusionary. The database therefore allows for the expression of forgetting and trauma, wherein memory is forgotten but the structures built around its absence remain. Brockmeier (2002) explains these empty structures, when created as deliberate art pieces, act as a "commentary on a given mnemonic system, a commentary that by its sheer existence… has already changed this very system" (pg. 35). That is, systemic emptiness as art shows "traces of an attempt of forgetting through extinction" (Brockmeier, pg. 30).

The interplay between forgetting and trauma, and absence as structure, are useful tools for thinking about the Anthropocene. In the age of mass information, there is also mass loss—of species, ecosystems, and ways of life—that alter our memory systems. Andres et. al (2010) believe a proliferation of media dedicated to traumatic events, in particular, illustrates "that art may be less a memorial to the past than an indicator that it is being forgotten" (pg. 16). In world

of digital memory, where permanent data traces upset “established norms of erasure”, there is power in deliberately creating an empty digital structure to represent the forgotten consequences of the Anthropocene—things that cannot be recovered by any digital means (Stainforth, 2022, pg. 266).

So it is that an empty database provides a means of acknowledging forgetting, or what Brockmeier calls an “exploration into the dialectic of memory and counter-memory” (2002, pg. 32). The Anthropocene coincides and intertwines with the digital age of cultural memory; its systems of memory include billions of bits forced into mnemonic structures. But the loss of the age is not so easily represented by data alone, and it is for this reason that an empty database—a form without data, but a structure that informs future memory nonetheless—may be a more accurate depiction of Anthropocenic loss than any other memorial.

The Eco Orator’s Route

Using the Anthropocene as a framing theory “concerns rethinking the relation between humans and the environment, their interactions, interconnections and interdependence” (Lucci, 2018, pg. 2). When applying these concerns to cultural memory and cultural memory institutions, one must ask the question: what is the relation between cultural memory and natural heritage, and how is the environment remembered in cultural memory? To remember the Anthropocene means to be keenly aware of how environmental concerns are portrayed in the passing down of cultural memories.

One way to prevent the convenient forgetting of environmental impacts in cultural memory is to dissolve barriers between cultural heritage and natural heritage. Bangstad &

Pétursdóttir (2021) argue that “heritage should attempt to exfoliate the binaries of culture and nature, human and non-human and make room for the appreciation that heritage phenomena are entangled in more-than-human material and environmental processes” (pg. 5). The idea of natural heritage as human heritage is common outside of Western thought in cultural ontologies where nonhuman, particularly natural, entities are acknowledged as active members of a cultural community (Harrison, 2015, pg. 27). Thinking of nonhuman entities and ecological phenomena in such a way also allows for nature to be a potential actor in creating narrative in cultural memory.

To think of natural heritage as an ecological voice in cultural memory allows nature itself to be part of the individual processes that affect and recontextualize collective memory through mnemonic resilience. As Ryan (2010) explains, “resistance to a collective memory narrative is facilitated by both the indispensability of the individual… in its reception and inherent characteristics that allow the individual to resignify it” (pg. 159). That is, by thinking of natural voices as indispensable members of a cultural community, environmental concerns can be at the forefront of cultural memory narratives, and the anthropogenic ways of thinking that drive the Anthropocene epoch can be recontextualized to think about humans-as-nature and nature-as-community. Adding ecological voices to cultural memory helps undermine “power vested in the humanist idea of the conscious and knowing subject” that dominates ideas of how cultural memory should be preserved and passed down (Bangstad & Pétursdóttir, 2021, pg. 6).

Nature is, of course, a broad term. When thinking about how to collect representations of nature in cultural memory, it is crucial to think of how nature represents itself both in collections and cultural practices: is nature the agricultural practices associated with a particular

crop, or the natural fibres used to weave a blanket? Is it the memories of a river in a homeland? When thinking about ecological narratives in cultural memory, ask how nature is constructed not as a concept but as a reoccurring member of the cultural community.

The Shapeshifting River

Holmes & Goodall (2017) begin with a single argument: that the intertwining of oral and environmental histories offers more discussion about the landscape than an exclusively empirical study, or an exclusively experiential one. In their words, this synthesis of histories "allows us to see what environments and the changes to them mean to people, and in turn allows us to see how they might decide to act in the present and future in relation to those environments" (2017, pg. 12). Oral history is the embodied experience of place and space; it pulls on past knowledge to situate and comment on present realities about the world and the way in which climate changes around us.

For Holmes & Goodall, oral history also "brings the opportunity to explore dimensions of class and race and gender into the experience of place", particularly for the colonised places whose environments were misremembered and poorly reconstructed by colonial industry and writing (2017, pg. 4). Because oral history is gathered from a community that remembers on deep scales, it offers an enriched commentary and complex blend on what is culture, what is social, and what is natural change in the places we inhabit. An inhabitable place of great importance is the river. Humans have long lived on rivers and their flood basins, with rivers providing food, fresh water, transport, and a variety of other universally crucial factors. The river, then, provides an ample case study for tracing the blended narrative of ecology and cultural memory in oral histories. Cultural memory provides ecological narratives in two ways;

the first is recording, and thus preserving, the impact of a changing environment across cultural and individual schemas.

Dudley (2017) examines the written versus oral history of the Severne river, finding that the oral histories "challenge a declensionist narrative" of the river's decline as a trading hub in written histories (pg. 18). Those who spoke about the river did so by narrating their sense of place within the river, and "ascribing the river a 'voice'," so that "natural agency may be recognised and documented, if not overtly discussed or considered" when discussing history (pg. 88). The oral accounts of the river, like the written ones, recognized the decline in natural resources it provided; however, the oral stories focus on the new embodied practices that have developed as a result of the river's decline, making their "bodies become repositories of both muscle memory and environmental knowledge" as they found new ways to relate their body and cultural practices to the ecological changes of the environment (pg. 94).

This brings us to second way an oral cultural memory creates an ecological narrative; through resilience and mnemonic resistance. Felci & Altom (2022) explain that "place attachment" in the oral histories of the Tuti people "can be a driver of resilience against change, including climate change"—that is, this community who lives along the flooded river is less likely to leave their place of cultural heritage because their oral histories, which stretch to deep time, provide them with resilience to combat unstable ecological changes (pg. 353). Felci & Altom (2022) also discuss how this narrative provides resilience in other forms of memory, such as having this ecological resilience expand to become resilience against colonialism and economic inequalities (pg. 364-365). The oral history of the flooded river, in other words, also

gives the Tuti people a mnemonic resistance against factors of the Anthropocene—climate change, capitalist hierarchies, and colonial resource extraction.

These two threads of oral ecological history—the thread of preservation, and the thread of resilience—give us insight into why oral history is often the tool of those forcibly removed from the colonial history of cultural institutions. Often, the curated exhibit offers a static document—one that can be ruminated on by visitors, but not one that captures the cultural complexities of ecological deep time and how it relates to present realities. The case studies of the Severne river and Tuti people ask how cultural memory helps to preserve the environment when it is an embodied experience, reinforced by oral narration that has been connected to that embodied sense of place for thousands of years. When the people and their stories are removed from the river, how does that impact the preservation of the river? It is a question, so far, that cultural heritage institutions have difficulty answering when thinking about cultural preservation.

The Collective Memory of the Mountain

A cultural heritage collection is very often presented to a community about a person, place, event, or thing to introduce these concepts as part of a collective memory. However, these collections are also often curated by a specific set of individual people who "embed [their] own identity and [their] own collective memory and mythologies" (Cook, 2013, pg. 97). The community archive, on the other hand, requires a collective participation, with the institution instead becoming a facilitator for community practices rather than a strict steward.

Cook (2013) explains there has been a schematic shift in the role of the archivist from custodian, to historian, to mediator, to participator, with the participator only one part of the holistic whole of a community archive. Cook (2013) outlines the benefits of this approach:

> Community archiving, as concept and reality, evidently makes us think differently about ownership of records, replevin, oral and written traditions, the localism-globalism and margins-centre nexus, multiple viewpoints and multiple realities about recordkeeping, and so much else, including evidence, memory, and obviously identity, and, depending on our responses, around deeper ethical issues of control, status, power, and neo-colonialism. (pg. 116)

What, then, happens when we consider natural heritage as part of collective cultural heritage, and how do reflections on and in nature become reproduced? When natural and cultural heritage are not thought of as separate entities, the "connectivity ontology" that binds them will "not only imply connections between individual humans and non-humans, but also a level of connection that includes all of them as part of a broader natural-cultural assemblage" (Harrison, 2015, pg. 32). The cultural community, in other words, extends in such a way that non-human entities become active agents in the community archive. Depending on the community and their ways of connecting, the dissolution of natural and cultural heritage as separate entities produces "various different ways of valuing, assembling, and caring for the future" (Harrison, pg. 38). This is a common concept in Indigenous ontologies, but can and should be thought of in other cultural communities so as to ensure land stewardship is not solely the responsibility of Indigenous groups.

One of the great holistic, connective tools is the crowd-sourced, "living", digital archive. Perla (2020) argues that digital methods democratize colonial cultural institutions because digital mediums are better able to represent local or indigenous ontologies of conflicts, the environment, and other factors from a community-based and borderless perspective (pg. 211). In particular, a living archive is an "inclusive and never complete set" of information that better mimics the fluidity of cultural memory compared to more static archives (Cardoni et. al, 2023, pg. 351). A living archive therefore also mimics "the performative celebration of the past through contemporary acts of creation and transmission" that occurs in other forms of collective memory transmission (Cardoni et. al, pg. 353). When combined with Harrison's idea of nature-as-community-voice, the digital living archive can then offer a telling narrative of natural heritage within the context of cultural memory schemas, and how the dichotomy between collective memory and individual memory seen in a living archive emphasizes or de-emphasizes the transmission of natural heritage.

The living archive, using digital connective structures, can then further the idea of Harrison's natural-cultural assemblage. As Harrison puts it, a living archive that contains multitudes of individual thoughts—such as an accessible digital archive—does not "resurrect a cosmopolitan universalism" in consideration of the global impacts of preserving natural heritage, but rather recognizes "the multiplicity of overlapping ontologies", including Indigenous and non-Indigenous perspectives, when it comes to thinking of nature-as-community (pg. 38). Natural-cultural memory is more easily disseminated and seen in a collective, living archive because of the myriad ways digital tools allow perceptions of natural heritage to be connected to each other, which in turn allows for a globalized way of thinking of natural heritage without

ignoring localized ontologies and ecologies. That is, the living, digital archive offers a better connective ontology between natural and cultural memory because of its ability to trace both individual and collective voices concerning nature and community archiving.

Old Lines

Well-trodden dirt paths, natural landmarks and barriers, and navigating with stars are a form of ecological memory that stretches back thousands of years. Before the imaginary lines of nation-states were lines of tectonic shifts and steady water carvings; perhaps this is why the simple acts of observing, navigating, and storytelling in nature provide such rich cultural and ecological memories for use in resisting the Anthropocene.

The importance of natural landscapes in cultural memory is fairly ubiquitous. Arguably, Dreamtime in Australian Aboriginal cultures is one of the most complex weavings of cultural and ecological memory. The Dreaming is a fluid concept that accounts for what we in the West might call space and place as they relate to our cultural and local ecologies. While eco-cultural landscapes are dotted across Europe as well, the concept of nature in the transcendentalist movement of Western thought suggests there was a shift away from this kind of memory that therefore needed to be reinstated. One could very easily argue it was no coincidence figures such as Thoreau and Emerson were writing at the height of Industrial Revolution in England, or that their distant successors like Rachel Carson were writing in direct response to factors of the early Anthropocene in America.

Schlitte (2022) agrees, arguing that this is because our concept of ecological space and place became reduced to linear, straight lines due to advances in modes of transport; we no

longer performed “the act of mapping the world with the body” that create embodied ecological memory specifically because of increased modernity (pg. 514). Haines (2018) also examines how Anthropocenic structures of energy economies disembody us from both our landscapes and our energy cultures as products of that landscape, and indeed examines this through the appropriate methodology of simply walking through “energy” landscapes:

> My walk into the prairie oil field was a first attempt to overcome that separation. I had chosen to walk because I wanted to measure the exhaustion of my effort and encounter the oil harvest not as a product of the system it supported but as an animal exposed, part of nature again. I wanted to break through the over-insulation of my life back home, to see and smell and touch the source of my survival, and to begin to know the scale at which I live in the early edge of the twenty-first century. (pg. 7)

It feels to be a fact, then, that we have chosen to disconnect our cultural narratives from Anthropocene landscapes—landscapes that have existed as holders of memory for tens of thousands of years, but are no longer bodily accessible because of road infrastructure, natural resource extraction, and urban sprawl.

To try and re-embody ourselves in ecological memory is crucial to preserving natural heritage. In cultures with strong ecological memory, such as the aforementioned manifestations of Dreamtime, or Hopi (Salmón, 2017), Bribri (Rodríguez Valencia et. al, 2019), Samoan (Fepuleai et. al, 2017), and more, embodiment of ecological memory is a dominant form of cultural memory that provides mnemonic resilience and sustainable climate practices.

Indeed, the concept of place and the embodied methodology of walking is so effective in preserving ecological memory that the walking-tourism industry has benefitted sustainable ecological preservation in Scandinavia (Svensson et. al, 2021), Iberia (Somoza Medina et. al, 2023), and Italy (Pileri & Moscarell, 2021) without sacrificing economic development for marginalized groups within those areas. Both a return to traditional ecological knowledge of landscapes, as well as using industrial complexes to preserve those landscapes, is directly tied to the embodiment of ecological memory.

Being able to embody oneself in nature and revitalize our natural pathways seems, then, to provide a mnemonic resilience against the Anthropocene by using embodied ecological memory. To be able to walk in places even where industry and urban infrastructure is predominant allows us a greater awareness of ecological systems and our place within a more-than-human memory.

Tasting Trails

Food heritage lays at a crossroad between tangible and intangible heritage; you can hold a fruit or flatbread in your hand, but touching it does not tell you the history of its cultivation, preparation, or social eating practices. Food is also natural heritage; it is only by hunting, gathering, cultivating, or domesticating nonhuman species that humans are able to eat.

Food also holds cultural memory: Indian writers use food memory to explore diversity and transnationalism (Anupama & Subbulakshmi, 2022), and in China, the embodied act of eating is incorporated into culinary museum tours (Chen, 2020). Such practices centre food as crucial in establishing culture, memory practices, and exploration of identity. The type of food

we eat, however, is originally tied to our local ecologies, and the rituals that developed around eating were thus developed from the synthesis of culture and the natural world.

In the modern world, where food is shipped around the world, food is also an example of ecological and local memories displaced. To think about food in this way, it is useful to look at how Sutton (2008) describes food memory functions:

> What makes food such a powerful site for exploring memory is the very fact that, unlike, say, public monuments, in producing, exchanging and consuming food we are continuously crisscrossing between the 'public' and the 'intimate,' individual bodies and collective institutions. (pg. 160)

A globalized economy often forgets the 'public' of food memory; it is rare for someone from a developed nation, for instance, to know exactly where the food they eat is grown and what community cared for its production. This creates a dissonance where the act of eating is still a universal memory practice, but the act of growing, harvesting, or hunting the food itself is divorced from the embodied and individual act of eating it. This is in part, of course, due to a global market economy where food is not a cultural practice but a form of capital.

An example of how food becomes displaced from its own local origins is the Mexican tortilla, where cheaper imported foods are replacing the traditional role of the tortilla due to a number of socioeconomic factors such as wealth gaps and limited access to local ingredients (Messer, 2007, pg. 199-200). Because food is so central to life, memory practices associated with a forced change in diet can lead to embodied trauma and a near-mythological reverence

for food practices once considered normal (Ruiz, 2023, pg. 9-11). This begs the question of how to combat the displacement of local food in the Anthropocene.

An answer to that question has already been explored in memory studies—what Barthel et. al (2013) call "bio-cultural refugia", which is meant to encapsulate both food security and "places that not only shelter species, but also carry knowledge and experiences about practical management of biodiversity and ecosystem services" (pg. 1143). Bio-cultural refugia, and bio-cultural memory, can be a form of mnemonic resistance. Let us return to Mexico, where the tortilla is threatened; Indigenous groups living in the state of Puebla have successfully resisted the colonial and global disruptions of their food culture by drawing on pre-Hispanic memories of food harvesting and traditional ecological knowledge (Lugo-Morin, 2022). A large part of this resilience is the preservation of biodiversity; Barthel et. al explain that "bio-cultural refugia are areas where diversity—as strategy—still is imprinted on the physical landscapes" (pg. 1147). That is, bio-cultural refugia is a successful form of local ecological preservation because food growers can mitigate the impacts of climate change by having a variety of species whose adaptions may be suited to various changes in climate (Barthel et. al, 2013, pg. pg. 1147).

The importance of bio-cultural refugia, then, is in mitigating both the displacement of food and the vulnerability of food culture in the Anthropocene. Safeguarding traditional food memory practices results in more stable local ecologies, better food security for those most impacted by political and environmental change, and lessens trauma related to famine or hunger (Barthel et. al, pg. 1148-1149). While areas of bio-cultural refugia may be more difficult to create under a global market economy or food monopolies, it is an idea that can provide

mnemonic resilience to many of the greatest factors of the Anthropocene, particularly and specifically because of the centrality of food to cultural heritage and memory.

Weaving Patterns

In what ways do natural materials find their way into archives, museums, and other memory institutions? Before landscape preservation and ecological heritage became intertwined with museum studies, the voices of nature tended to present themselves through art and craft made of naturally-occurring materials—refined and sculpted by humans, but symbolic of how humanity itself is weaved into the local ecologies they live in. Weaving is an example of memory storage before the colonial practice of memory institutions, particularly because weaving reflects changing worldviews of living communities even as it may lose its "natural" heritage.

Textile production in particular is a defining trait of humanity, and certainly one of the oldest forms of both artistic and utilitarian creation in human history. The embodied act of weaving, as well as the material product, are heavily tied to the passing down of cultural memory and the manifestation of worldviews in material objects. In many cultures, weaving patterns are tied to familial, cultural, and natural histories, having been produced through the harvesting of local materials for thousands of years. In Navajo culture, for example, weaving is part of a myriad traditions both cultural and economic, but most importantly, "the making and selling of weavings involves a symbolic exchange between weavers and their ancestors as they practice the skill the Diyin Dine'é [Holy People] created for their benefit" (Ahlberg-Yohe, 2008, pg. 370). The same is also true for Taquilean weaving, where cloth is "a supremely time-consuming medium in which to encode meaning, wealth, and cosmology" (Zorn, 2004, pg. 54).

Traditional weaving practices are also explicitly tied to cultural changes in said worldviews; in the Anthropocene, this change manifests as changes in local ecologies and traditions as a result of globalized market economies and industrial production. While the Navajo, who already saw weaving as a form of exchange, were able to adapt certain aspects of local weaving to trading with colonial and global cultures (Ahlberg-Yohe, 2008), other textile practices suffered in their forced adaption. For example, Graham critiques the reliance on internet marketplaces to fund Thai silk production, stating that "the need to transform tacit knowledge into marketable explicit knowledge results in shifts in selling and production practices" of silk that are better preserved when funded by local heritage and governmental initiatives who can also assist in preserving, not just financing, silk production environments (Graham, 2011, pg. 460).

Zorn (2004) explains how the removal of textiles inherently tied to local production can also disrupt other factors:

> In one famous case, ancestral textile bundles (q'ipis) were illegally removed from the community of Coroma, Bolivia. The people of Coroma prepared a rare written document supporting their claim to recover the bundle (Bubba et al. 1990). Losing the textiles, they wrote, would destroy the entire history of their community (not only of the textiles themselves) and cause the ayllus [family networks] to disperse, rupture religious beliefs, and displease the ancestors, as well as destroy social organization. Such is the power of old textiles, the work — and the embodiment — of the ancestors.

Given that traditional textile production has had to turn to factory-made fibres, and foreign expectations—all factors of global industrialization and destruction of local ecologies—to ensure the practices continue, what does that mean for weaving and craft production as its own form of memory institution?

Sometimes this requires adapting to the colonial notion of the memory institution; one such example is the digital library for Jordanian handicraft, which documents raw materials used, traditional symbols and uses of woven crafts, and recordings of lived experiences of the creators (Amoruso et. al, 2023). Another is crafting subject headings and proper categories for Thai silk production to make its cultural ontology more apparent in search and recall systems (Promthong et. al, 2022). These projects are an attempt to reflect embodied and nonhuman memories in a collective system, de-emphasizing colonial ontologies of material goods.

However, some woven objects—and the embodied acts that create them—have been able to stay as self-contained memory institutions even as they are changed by outside forces. Navajo and Taquilean weaving, while they may have changed to focus on commerce or the convenience of synthetic fibres, still use ancestral tools, control their own embodied practices, and reflect change in their memory-making on their own terms even amidst struggles of colonization (Zorn, 2004; Ahlberg-Yohe, 2008). This is also true of the Hakka people, who have managed to sustain both their local economy and local ecology through catering traditional fibre products to non-Hakka peoples (Liufu et. al, 2023). Is it these kinds of modern crafts or the antique weavings held in a colonial museum that more accurately reflect local worldviews?

In truth, even as woven materials may move away from being "natural" or "locally" produced, weaving still acts as an important way of passing down and storing memory. If one wanted to combat factors of the Anthropocene—colonialism, climate change, and late-stage capitalism—a solution would be to increase biodiversity and conservation initiatives that protect both human and nonhuman culture alike (Liufu et. al, 2023; Barthal et. al, 2013). However, regardless of what woven materials are made from, they reflect an understanding of change and provide a living form of cultural memory.

The Archaeo Futurist's Route

Cultural memory is a concept tied to time: past, present, and future affect how memory is constructed or forgotten. But cultural memory is also tied to humanity, whose lifespan as a species is but a speck on the scale of deep time. Thinking about cultural memory in deep time forces us to recontextualize why we incorporate prehuman concepts into our cultural memory, and how our cultural remnants preserve our memories for posthuman futures.

Prehuman artifacts have been variously collected and conceptualized by cultures and institutions. The most obvious is the fossil. Fossils remind us that Earth's memory stretches beyond ours, but that we can incorporate it into our cultural systems nonetheless. Kolbert gives the example of the ammonite, a species long extinct whose fossils have been used as material goods, medicine, and religious practices, giving them a long memory record across many human cultures (pg. 83). Bowker calls the memory practices we use to configure the prehuman past the "mnemonic deep" (pg. 4). In the Anthropocene, the sixth mass extinction event, our ways of remembering the extinct places and things that existed before us force us to rethink how we remember the rapidly disappearing world of the present; or, as Bowker puts it, we must make a

move away from memory practices that "currently cast into oblivion" traces of the past on both the deep and present time scale (pg. 4). Essentially, prehuman memory reminds us that past memory is always recontextualized by the present and the future, but that such retellings are highly dependent on how we have preserved and incorporated the past into memory.

Posthumanism thinking also situates our cultural products in deep time, where our present productions become the potential fossils of the future. As Kolbert reminds us, the dominance of humans in the present era "has more to do with dinosaurian misfortune than with any particular mammalian virtue", highlighting the common fear that humans could go extinct even in their own epoch (pg. 91). What the Anthropocene leaves behind, then, is a topic of interest in posthuman heritage studies. Sterling (2020) suggests that the Anthropocene's ability to invite spatio-temporal thinking can create more than doom narratives; thinking about memory in the posthuman world creates memory practices that "imagine alternative ways of living and acting that are inherently oppositional to the apocalyptic motif of the ark" (pg. 191). That is, speculating on futures where humanity only exists in memory forces a crucial rethinking of how and why memory is preserved, and thus how an epoch of human dominance might be mitigated in memory—or, how the monuments and traces of the Anthropocene can be used in future memory systems to prevent such an era occurring again, even if humanity and human memory have disappeared.

Both the before and after of humanity force us to think about our current memory practices, and how the Anthropocene could be remembered in deep time. Naess's (1973) theory of deep ecology argued for a step away from anthropocentric views on environmental issues in order to recognize the intrinsic value of all life, regardless of its perceived usefulness to

humanity (pg. 95). Applying theories of deep time and deep ecology to memory, we can force ourselves to de-center the human from memory preservation practices and ask: how do we situate memories of the Anthropocene, the era of humanity, in deep time? When the importance of the human is divorced from cultural memory, we can reconfigure ways of thinking about the Anthropocene and how its narratives can "be discarded, vilified or fundamentally reimagined" by deep time ways of recalling the past and imagining futures (Sterling, 2020, pg. 192). In much the same way prehuman memory objects and ecologies can inform present memory practices and preservation, deep time allows us to think about how human cultural memories might pass on stories of the Anthropocene to the future to be recontextualized in speculative memories.

(Un)recognizable Ruins

It is not hard to conceive of ruins as cultural memory. They are built by human hands; they are interpreted and re-interpreted as civilizations change; they provide valuable insights about cultures that were and cultures that could be. But ruins also outlast the cultures that build them, and in the Anthropocene, there are fears that ruins will outlast not just a single group of people, but the end of humanity in a post-apocalyptic crisis.

Do ruins, then, still become part of memory when there is no one left to remember them? The idea that human memory will remain when humans may not is part of "speculative memory", or the concept that cultural memory could exist in a non-human, or more-than-human, world (Sterling, 2020, pg. 207). Sterling suggests that ruins "in this context are spaces of precarity and of potential resurgence… because the very processes of ruination force us to imagine and negotiate" memory without a human-focused lens (pg. 208). Ruins are not

precarious in the sense that they will disappear as easily as more fragile heritage in the Anthropocene, but instead serve to highlight the real precarity of human dominance and its possible extinction.

Combining the fears of the Anthropocene with the memories embedded in ruins, we use memory and ruination to think of a future that "is both a projection and an attractor, shaping how we think and behave in relation to the contemporary world" (Sterling, 2020, pg. 215). The fear of the future becomes tenfold when we think of modern production of ruins; that is, ruins not produced by ancient cultures, uncovered hundreds or thousands of years later, but ruins discarded as quickly as they are built in the name of capitalism, industry, and progress. Beck (2021) refers to this process as "accelerated ruin", which creates "decrepit but not yet demolished relics of modernity" (pg. 89). These ruins project the fear of a "stagnant and rotting future" because they are mired in an "inaccessible recent past" that comes and goes too quickly to form a sturdy schema within cultural memory (Beck, 2021, pg. 89).

The dichotomy between accelerated ruination and speculative memory is thus: how do mass-produced ruins interrogate the image of humanity within the speculative timescale of human extinction? Beck (2021) argues that such apocalyptic thinking should not separate human ruins from humanity, but instead force us to critically think of "the image of the post-apocalyptic city as an available space for creative refashioning" (pg. 102). Sterling furthers this point, arguing that cultural heritage can use ruination to combat the egotistic idea of human progress and heritage-as-immortalization; thinking about memory and ruin can instead promote "a fundamental reorientation towards decomposition and the complex multispecies worldings likely to emerge in spaces of neglect and despair" (2020, pg. 210).

Ruins in cultural memory can then become, as speculative memory promotes, places of disassembling and interrogating the dominant narratives in cultural memory. Ruination—and the fear of it—can challenge ideas of heritage and memory by going past the human and considering the posthuman significance of memory and monument. Do humans need to be remembered? Do we need to be the main character of the Earth's archive? As Szerszynski (2017) explains: "any monumental system for the Anthropocene would need to signify that this epoch-in-the-making will be actively woven from multiple stories and diverse imagined futures distributed around the globe" (pg. 128, qtd. In Sterling pg. 214). The monumental significance of ruins, then, turns our thoughts away from human progress and significance, and instead challenges us to think about how cultural memory visualizes futures without humans.

The Scent of an Extinct Flower

There are systems we use to try and archive the existence of other species. One is the use of scientific taxonomies and classifications as a way to try and create an "objective" view of the species. Bowker (2005) argues that a physical, paper archive is similar to taxonomic systems, where the archive becomes a series of "disaggregated classifications that can at will be reassembled to take the form of facts about the world"; in both the archive and the taxonomic system, the personal memory of the thing being categorized is lost (pg. 18). And, in the strict guidelines of taxonomy, "an ineffable smell is harder to capture… than a Latin binomial" (Bowker, 2005, pg. 137). Our systems, so critical to our cultural memories, cannot even capture the scent of a flower the botanist is transcribing to paper.

The second is the presence of life on the natural, deep time archive; that is, the traces of life in sediment and fossils and bones. Bowker argues that life seen through Earth's natural

record is another form of memory, and that more traces of that life's memory in the natural record correlate with better natural success (pg. 19). This archive, too, lacks the context of memory. In every medium (the archive, the binomial nomenclature, the layers of sediment), the data is but a fragment to which we superimpose our own narrative memory of the life forms being described. Like our own archives, we are remembering the geological record as it relates to our present time and cultural importance.

This issue comes to the forefront when we try to recall an extinct species. We tend to first classify and document the species most important to us; Humphreys et. al (2019) gives us the example of trees, a group of life that forms the backbone of "cultural, ecological, and economic interests" across so many cultures that their documentation of not just their life, but their extinction, is much higher than that of other plant species (pg. 1045). In other words, we carefully monitor the tree through our classifications and records, and properly mourn it when it disappears. Other plants are not so lucky. Herbaceous plants and flowers are not so closely recorded, meaning their extinction goes "unreported, resulting in underestimation of [extinction] rates" (Humphreys et. al, 2019, pg. 1046). There is, for the unassuming flower, not even a proper system of forgetting it, because it was never remembered in the first place.

Does an undocumented extinction matter to us, then, if it only exists in the deep time geological record, and not in the "the tools of our own archive"—the tools we have to remember what is important to us (Bowker, 2005, pg. 18)? The answer is that we are not discussing the extinctions of epochs past, but the one we live in parallel to, where deep ecology and present time converge. Humans transform land at a massive rate, but it is the "pure", untouched, and "charismatic" species whose biomes are protected and examined in the

Anthropocene; the others have already disappeared in the constructions of urbanism and tourism, because we have prioritized that which we already viewed as culturally or aesthetically crucial (Bowker, 2005, pg. 146-148). The geological record cannot keep the scent of the flower preserved for us; the city built over its seeding ground cannot keep it either. When the inevitable extinction of the undocumented occurs, we must wonder what it tells us about our systems of memories for the extinct species we did choose to remember.

A Piece of Space Debris

What are astronomy and space travel to the environmentalist? How do we configure cultural conceptions of Earth, its resources, and its people when faced with the vast frontier of space? The anthropocenic lens suggests that we currently treat the universe much the same way we treat Earth: as a resource for extraction, and as a place to expand the ingenuity of humanity at the cost of everything else. And so, when we conceive of how we will be remembered on a cosmic scale, we must conceive of how humanity creates remembrances in the current epoch.

The idea of a Space Anthropocene is not one that solely exists in posthuman or transhuman narratives; it already manifests in the current Anthropocene epoch. Morin & Richard (2021) explain that space debris grows as society becomes increasingly reliant on satellite technology, but will eventually create a layer of debris that restricts both the reliability of these technologies and the potential of space travel through the dangers of excessive space waste (pg. 568). Much like any other form of technological waste, space debris never lessens because the financial profit of clean-up pales in comparison to the profit of simply making more (Morin & Richard, pg. 568). Importantly, space is not Earth: there are no people living in space,

no territorial claims, and very few government regulations, that work to understand the cosmos as a place for sustainable living (Morin & Richard, pg. 569).

The current issue of ignoring space debris is part of the larger problem with "space optimism", or the idea that humanity will undergo an evolutionary and/or technological change to thrive in the cosmos. Most techno-utopian views on space are rooted in colonialist and expansionist ideals, originating from the 1960s where "peaceful space explorations were simply not self-justifying activities, politically speaking," and "science of any sort was popularly supported because it was expected to have valuable worldly applications" (McQuaid, 2010, pg. 164). These "valuable applications" were "popularly" determined by governments interested in pushing the importance of resource extraction and territorial claims onto the public conscious, and not the scientists who saw forays into space as new ways of understanding Earth, and, more importantly, understanding the duty of humans living on it. Sideris (2018) argues that "a turn to the universe… fueled by cosmic ambitions carries with it contradictory and often troubling implications for humans' capacity to exist within natural and human limits"; or, that posthuman ideals of a cosmic humanity conveniently ignores that humanity has not solved its own limited existence on Earth (pg. 400).

That is, debris in space becomes the new radium in the geological record; evidence of humanity in deep ecological time, but pushed beyond the boundaries of both Earth and human existence, creating a posthuman cultural memory of extraction and waste. Considering humanity's fascination with creating cultural memories in space, for both ourselves and the potential of the more-than-human or other-than-human, there needs to be a cultural shift in how humanity treats remnants of themselves in the geological record before they understand

themselves in the cosmic one. Sideris, for example, points out that space optimism, transhuman futures, and the belief that humans are a crucial spatiotemporal force on a cosmic scale will "naturalize and normalize human domination of—and even, ultimate departure from—our planet as an inexorable and even desirable evolutionary development for a complex species like ourselves", rather than drive an ecologically sustainable future for the cosmos (Sideris, 2018, pg. 415).

How, then, can we understand cultural memory on a cosmic scale, divorced from debris, extraction, and the idea that we must leave Earth to continue our remembrances? After all, time capsules and other archives sent into space "become redundant antiques of their creator's lifetime, traditions and other customs once removed from associated cultural, social, linguistic and semiotic influences"; that is, our current cosmic archives of memory simply become another form of space debris (Beyond the Earth, "Companion Guide"). For cultural memory to exist as more than excess trash, environmental preservation and ecological heritage initiatives must be embedded in the remembrances we leave in the cosmos. Beyond the Earth and other space-ecology heritage foundations offer the idea of sending not songs, writings, or rituals into space, but the knowledge of taking care of Earth to provide "deep time stewardship information" (Beyond the Earth, "Our Work"). For instance, they argue that records of radiation in the Earth's crust and the history and causation of climate patterns, sent to live in our orbit, will impart the cultural know-how for distant or more-than-humans to take care of the Earth in much the same way any form of cultural memory imparts narrative lessons of the past (Beyond the Earth, "Our Work"). By creating ecological records in space, there is a recentering of Earth not as a forgotten and dying beginning for humanity's expansion, but as a continuous place in

human and posthuman memory to return to again and again in cosmic history—in other words, cosmic heritage must reaffirm our stewardship of Earth even if we become distant to it. As Sideris argues, "if there is to be a future worth celebrating for human and more-than-human life on this planet, it will be one where we learn to embrace and live within limits" of ecological sustainability (pg. 417).

What these initiatives impress upon our conscious is that there is no way to divorce human memory from geological memory—no way of turning to the cosmos to avoid the imparting of human culture we have already left on the geological record. The importance of space debris is how it is configured by both human and more-than-human memory, or rather, how it symbolically represents cultural heritage. If it exists only as debris, then it represents only the cultural practices that led to the Anthropocene: extraction, greed, and trying to make the limited limitless. If, however, the debris is configured to be remembrances of the Earth as it once was, or the Earth as it could be, then memory may be used as a way of reinforcing ecological heritage within cosmic heritage.

Pleistocene-Oriented Programming

In the early Pleistocene, archaic humans lived in ecological landscapes and practiced ways of passing down knowledge foreign to us. Traces of these prehuman species and their living conditions make their way into modern cultural memory institutions, prompting the question: how do prehuman records inform our modern, anthropogenic memory practices? Or, more specifically, how do we think about the anthropogenic narrative of cultural memory itself?

We can envision the memories of archaic humans only through the geological and material records they left behind. Henshilwood & Dubreuil (2011) explain how prehuman living spaces and bead production suggest a development of collective symbolic meaning before the biological development of Homo sapiens, and Bednarik (2022) sees these artifacts as an "indication of how the human ability to create the ideational world in which the ancestors saw themselves existing" could be predated by or a result of archaic humans creating external artifacts representing symbolic memory (pg. 1519). Watkins (2016) explains that these "repositories of symbolic cultural memory through art, sculpture, and architecture" before the development of language was just as crucial to the development of early humans as climate change was, merging ecology and memory as equally important factors before the Holocene—and indeed, the Anthropocene (pg. 95). But these artifacts are thought to be separate from language; they are material objects from cultures that may have not developed language at all, and their narrative symbolism is lost to us because we cannot fully conceptualize the information retrieval system needed to understand these external artifacts.

Why does it matter that we only have objects, and no oral or written tales from our prehuman ancestors? In some ways, it helps us contextualize our modern use of objects. Manovich (2001), explaining object-oriented programming and how it affects knowledge in databases, says:

> As a cultural form, database represents the world as a list of items and it refuses to order this list. In contrast, a narrative creates a cause-and-effect trajectory of seemingly unordered events (items). Therefore, database and narrative are natural enemies. Competing for the same territory of human culture, each claims an exclusive right to make meaning out of the world. (pg. 225, qtd. In Bowker, pg. 29)

In object-oriented programing, the object must hold all relevant information about itself for specific retrieval requests, and does not need to be linked by narrative. But, like the memories held by prehuman objects, the objects in our databases still require narrative context in order to be culturally relevant; Bowker argues that any information retrieved from a programming object is information used to craft a narrative of the past that suits present sociopolitical forces, creating extrapolations of a past that never existed by forgetting some or all parts of the object because no system is capable of categorizing or retrieving all the object's potential information (pg. 32). To compare the two, the Pleistocene object's memory can only be narrativized by present forces because its past is not embedded in it—but the database object must be narrativized by present forces because the information contained within, like the Pleistocene object, can never be presented as whole or complete by information retrieval systems.

The symbolic objects created by archaic humans ask what happens when the objects in the Anthropocene contain information that is no longer retrievable. If, as certain doom narratives suggest, the Anthropocene is not just the epoch of humanity but its swansong as well, then should we manipulate our memory functions so that they are properly, and fully, embedded in the objects we leave behind? Or, should we accept that the information in the objects we produce, like the objects of our archaic ancestors, are imperfect products of an "eternal present and linear chronology" whose information structures will always disappear (Plokhotnyuk et. al, 2020, pg. 33)? Whether it is a digital object or material one, relating Anthropocenic objects to Pleistocenic ones ask us if we can make peace with the death of the human narrative in both our lifespans and the objects we leave behind.

The Silurian Stratigraphic Sample

The Silurian Hypothesis asks what traces a sufficiently advanced species will leave on their geological record, but only as a single layer in the history of deep time. This layer, on its own, has no meaning; it requires the layers of epochs past and future, and the cultural and scientific knowledge needed to analyze geological records, to make sense of its traces. As such, it exists as part of a larger memory-science system in which the Anthropocene is monumentalized and available for reinterpretation through memory, science, and natural traces.

First and foremost, the Silurian Hypothesis focuses on tangible traces. Much like the fossils of older epochs, species who have developed technology and industry on the scale of the Anthropocene will create observable heritage on a scale both hundreds and millions of years long. Schmidt & Frank (2018), creators of the Silurian Hypothesis, explain that the Anthropocene will manifest geologically with "specifically persistent synthetic molecules, plastics, and (potentially) very long-lived radioactive fallout in the event of nuclear catastrophe" (pg. 11-12). Their hypothesis argues that these traces are consequences "of the specific path human society and technology has taken" and as such is a specifically Anthropocenic way of recording activity (pg. 17). That is, Silurian Hypothesis asks what traces our modern human era leaves in the ecology of deep time, and how we, as a civilization with the proper set of tools and past knowledge, might recognize the presence of an equally advanced civilization's impact even after it is gone.

The hypothetical Silurian layer does not just contain traces of civilizations, but larger ecological impacts. The Anthropocene is a product of the intertwining between natural and

industrial process, where human activity dominates but also mingles with the natural activity of the Earth, and as such a Silurian layer is differentiated not by unique identifiers but by a unique combination of them (Schimdt & Frank, pg. 11). In this way it is a fitting monument of both human impact and humans as part of a larger ecological system. Szerszynski (2017) argues stratigraphic layers can be part of what he calls a monument-memory system, "in which various structures, spaces and inscriptions are put in relation with each other, with the wider spatiotemporal patterns of social life and with the canonical narratives and values of cultural memory" (pg. 119). In the case of the Silurian layer, it is a noticeable monument we can narrativize in relation to the spatiotemporal traces of other layers. The Committee on the Geologic Record of Biosphere Dynamics (2005) explains, for instance, that acquiring "knowledge of pre-human baseline states and natural variability is essential for discriminating between anthropogenic and non-anthropogenic change" when looking at geological records because it allows us to situate ourselves in natural, rather than cultural, memory (pg. 153). Zalasiewicz et. al (2021) also explain that thinking about human history in stratigraphic time makes "the human/natural distinction "increasingly redundant, with human history and natural history now having merged into one story" in the Earth's record (pg. 5). Essentially, natural volcanic eruptions and artificial radionuclides alike become part of the narrative of the Anthropocene in the geological record; and, if we think of chronostratigraphic layers as a monument-memory system, then we can use the hypothetical Silurian layer as a monument for thinking about human values towards their own ecological processes during the time of the Anthropocene.

So it is that the Silurian layer, whose hypothesis is grounded in Anthropocenic practices, could offer a tangible trace—a monument—of human values within the mnemonic deep record.

Not only that, but it situates those values in a larger ecological system and accounts for a variety of global, not just local, impacts. As Szerszynski (2017) believes, “any monumental system for the Anthropocene would need to signify that this epoch-in-the-making will be actively woven from multiple stories and diverse imagined futures distributed around the globe”; that is, effective monuments for disseminating the cultural memory of the Anthropocene must hold global, long-term, and ecological information all at once (pg. 128). If stratigraphic layers are monument systems, then the Silurian layer is a monument to human resource extraction, technological progress, and our diverse roles in both our current ecological systems and the deeper ecological systems of Earth’s 4.5-billion-year history.

That is, the Silurian Hypothesis is a speculation on the memory-monument system of geological epochs. A recognizable trace of the Anthropocene does not exist on its own, but is part of a larger system of memory-making in which we contextualize the various stories and practices of the Anthropocene, as well as how it intertwines with larger ecological changes. In this way, the speculative traces of the Silurian layer ask how we narrativize the tangible forms of the Anthropocene in memory to situate human activities and remembrances in natural memory, deep time, and global cultural systems.

The Solar Punks Route

There are many ideological and artistic movements that provide counter-narratives the doom and gloom of an apocalyptic Anthropocene, but perhaps the one tied most to mnemonic resistance and resilience is solarpunk. Solarpunk is “punk” specifically because it is “rebellion against the structural pessimism in our late visions of how the future will be” (Owens, 2016, para. 3). More importantly, one could argue it is a form of cultural memory practice because it

attempts to link a known past and a formative present to a potential future; the ideal society of solarpunk relies on “the revival of older, less damaging technologies” and a “renewable energy foundation” that “already exists” (Gillam, 2023, pg. 2).

A solarpunk future also focuses on degrowth economics, social justice, and ecofriendly communities borne from “creative reuse of existing infrastructure” and “Appropriate technology”; that is, it does not decry the industrial pit into which we have already dug ourselves (Solarpunk Community, point 18). It is useful, then, for thinking about how solarpunk as a form of mnemonic resilience can “reject the dominant memory”—in this case industry as growth, technology as hierarchy, and a doom narrative surrounding our disappearing ecosystems—and apply a more hopeful application to the world to “invers`e [a memory sign’s] in`tended signification” (Ryan, 2011, pg. 16). Essentially, solarpunk as mnemonic resistance is able to look at the current state of the world and suggest an alternate, not new, trajectory from what we have.

When thinking about solarpunk in relation to our Anthropocenic themes of cultural memory—waste, pre- and posthuman memory, ecological memory, and solastalgia—we should think about how solarpunk aims to instill “a duty to create future conditions that limit scarcity and reduce the risk of catastrophic state shifts in the Earth’s systems” (Gillam, 2023, pg. 9). A large part of this is creating social justice communities for both human and nonhuman, present and future (Gillam, 2023, pg. 6). It also focuses on reduction: reducing the waste we produce; reducing the labour needed to function and making labour a creative practice; reducing our impact on our local ecologies. In questions of memory and, collecting, of course, we should think about reduction in terms of what we keep and what we are okay with losing.

It is for this reason that we will look at our Anthropocenic collection as something that may or may not exist into deep time, but for as long as it exists can be used as mnemonic resilience objects reminding us the Anthropocene can always be reconfigured. Perhaps the technology and industry we create will be used to create equitable communities for human and nonhuman lives; perhaps we are able to not just preserve ecosystems, but let them flourish and grow along with ourselves. Perhaps we will slowly disappear, but we will have created something worth remembering before we do.

Industrial Insights

It is a simple fact that the Anthropocene produces more waste than any other era before it, whether it is carbon, plastic, or nuclear. These are the products of industry, laid to the side, and yet—what if we remember that they exist, and treat them with the same innovation we do our raw natural resources?

Waste was once a dominant player in cultural narrative; breeder nuclear reactors, which recycle their own waste, have existed since the 1960s, and circular practices for disposing of carbon outputs or toxic metals have long been proven effective. What makes these projects ineffective is not waste, but economics; recycling nuclear waste became unimportant when uranium deposits were discovered, leading to more extraction sites and reactor waste than the more costly, but sustainable, alternative (Johnson, 2010). Corporate policy creates waste; beyond the energy and extraction fields, there are also right-to-repair laws held in the hands of electronic producers that prevent equitable recycling of electronic waste (Stead et. al, 2023).

But waste is forcibly pushing itself into public conscious, as its sheer mass makes it difficult to avoid. Living in the Anthropocene means living with waste—the next step is to learn how to mitigate the growing crisis of more waste. Haraway (2016) argues that industrialism and capitalism can be transformed by dissociating it from a patriarchal military complex, allowing the tech revolution to fall into the hands of the marginalized labour forced to create it. The solarpunk movement also imagines a future "where technology is utilised for human-centric and eco-centric ends"; that is, the solution to industrial waste is not to destroy industry, but to change its trajectory (Owens, para. 11). In both solarpunk and cyborg feminism futures, industry is about envisioning a way to "take the existing aspects of our current world and repurpose them into something more liberatory" through technology and tradition alike (Owens, para. 10).

But how does a cyborg, solarpunk future resist the pull of waste? To create a mnemonic resilience that thoroughly debunks the dominant notion of progress-as-capital, concepts of industry and infrastructure in memory must be reconfigured by both traditional memory and innovation. Reliance on oil is mitigated in Arab nations by eco-cities that merge "ancient Arabic architectural techniques with modern technology", which also has a top-down effect of increasing social equity (Saidin & O'Neill, 2022, pg. 251), and incorporating Indigenous knowledge into extraction practices leads to sustainable forestry practices (Lertzman & Vredenburg, 2005). On the cyborg side, "smart" technology can monitor and better recycle different types of urban waste (Parikka, 2015), and reintroducing "aspects of orientation, memory, and territory" from ecological awareness into data structures provides both a more equitable and ecologically friendly smart city (McCullough, 2011, section 3). Once waste, marginalized labour, and both technological and industrial hierarchies are acknowledged, older

forms of cultural memory can be incorporated into these practices to produce more equitable forms of innovation and industry.

In summary, bringing industrial waste to the forefront of the narrative before it arrives there with force allows us to consider a way of resisting the waste object—while still practicing innovation as a key concept in cultural narratives. What needs to change is not innovation, but what fields we choose to innovate in and who "industry" is for in a human-dominated era.

Presence of Seeds

In the vaults and archives of the future, we create memory objects meant to outlast human stories. One of the most ecologically pertinent is the seed vaults created for protecting endangered species and aiding in landscape conservation efforts. The cultivation of seeds has also existed long outside the vault in various pre-modern agricultural and gathering practices, but perhaps moving away from the ideas of agricultural cultivation or vaults frozen in time will allow for a better living archive of seeds.

The vault brings up a human-centered image, but seed banks do not only preserve seeds crucial to human life; they preserve seeds crucial to ecosystems in general. The presence of wild and uncultivated seeds in seed banks suggests a "garden ethos" that "embraces the stewardship of ecological adaptation in order to support ecosystem function rather than preservation of form" (Lewis-Jones, 2019, pg. 108). As such, a seed bank has the potential not just to preserve manufactured agricultural landscapes, but "wild" ones as well. Harrison (2017) claims that "conservation practices of different kinds are not normative, but vary across time and space, actively shaping different kinds of future worlds" (2017, pg. 80). To preserve seeds unimportant

to our current lifestyle suggests a forward-thinking memory of what futures seeds can hold even when they are unbound to humanity.

The presence of seed libraries in urban centers also suggests an acknowledgement of how ecological memory can manifest in cities even as they stand as monuments to a fast-paced, human-centric lifestyle that will die as quickly as it lives. A wild seed, unlike a building, computer, or chemical, resists the idea that it must perform a cultural function; it simply is, and will continue to perform that function of existing long after human memory is wiped out. Harrison argues that the freezing processes of vaults force seeds to become "banked as latent values that are only to be realized at some future moment in time", rather than be a living archive (2017, pg. 86). By existing as a communal resource in a living urban space, seed libraries can naturally resist the ephemeral and entropic view of the Anthropocene "in which time itself is perceived to represent an implicit threat to biological and cultural diversity" (Harrison, pg. 82).

It is perhaps no wonder that the overgrown ruined city is so central a concept in solarpunk. Rather than think about human traces in stratigraphic layers and mass extinction events, it is essential to portray a more hopeful, albeit invisible, trace of human hands through the growth of a seeded landscape. Wild seeds are often redistributed into the landscape to grow and propagate outside of human hands; but, because they are frozen after thousands of years of living alongside humans, seeds are individual archives "that contain a series of specific biological–historical accounts (genes) of multispecies biosocial relations" (Harrison, pg. 86). Lewis-Jones suggests that seed banks are effective only when the other living parts of the ecosystem are considered in their re-introduction; "the right soil, the requisite mycorrhizal

fungi, [and] pollinators" are needed to avoid "domesticating" wild spaces with frozen seeds, meaning the ecological/cultural heritage dichotomy must be considered both within and without the seed bank (2019, pg. 109).

Seeds, then, both hold and exceed human memory. The diversity of seeds both wild and cultivated, natural and urban, suggest that they are a living archive not just of human activity but of a longer geological activity of landscapes. Because seeds have existed alongside us for so long, our traces will remain in their propagation even as they flourish beyond the Anthropocene.

Constructed Eco(Tones)

So many schools of thought and science favor the visual senses that our humble auditory processing is pushed to the side. Soundwaves are a physical and material aspect of our environment that we have just as easily manipulated, disrupted, and reconfigured as anything else in the Anthropocene. If we stop to listen at the boundaries of human and nonhuman senses, what do we hear?

Environmental soundscape artists are deeply associated with both ecological and embodied memory; Louro et. al (2021) argue that, contrary to viewing the world, listening enables "a way of being in the world as an involved participant" that allows for us to "environmentally sense ecosystems and register transient power relations inherent to the Anthropocene before they get inscribed into the geological strata" (para. 18; para. 20). Listening to an ecosystem is then a preventative, anticipatory and participatory act that can bring awareness of the Anthropocene before it happens. Modern innovations in sound technology

allow us to record or create reconstructions of previously invisible movements such as climate patterns, insect noises, and the growth of fungi translated to sound waves (Louro et. al, para. 22-24).

While one might argue that these sounds constructed through various iterations of technology are somewhat artificial, constructed soundscapes can act as a form of speculative literature that have "the power to evoke sonic dystopias as well as sonic utopias" (Jäggi, 2021, pg. 92). Jäggi (2021) further argues that edited compilations of field recordings produce different speculations based on where they were recorded, giving the comparison of recording endangered ecosystems versus empty buildings and urban noise (pg. 93-85). Much like solarpunk, there is a utopian vision to be found in the dissolution of the natural-urban barrier to help us rebel "against the structural pessimism in our late visions of how the future will be" (Owens, para. 3). Enhancing those sounds allows us to bring hidden natural voices to the forefront of our future narratives.

That is, much like solarpunk fiction, constructed eco-soundscapes give us a vision of "a built environment creatively adapted" to living in ecofriendly ways "using different technologies" (Solarpunk Community, point 20). Beever (2019) argues that using technology as a medium for listening to invisible natural sounds actually bridges the artificial gap between humans and nonhumans because "the methods of soundscape ecology can model the umwelt (the outer world of experience) but not the innenwelt (the inner world of experience), while listening is the intersection of both" (pg. 87). That is, technology-aided listening forces a recognition of how nature is perceived both by and by itself.

As such, listening to technologically-derived eco-sounds "direct us towards achieving renewed consciousness about particular zones of the biosphere or develop empathy towards species that we have never contacted" (Louro et. al, 2021, para. 26). What if our constructed soundscapes were "like a combination of a vivid rainforest and a vital city, [with] each of them respectfully leaving space for the other to be heard" Jäggi, 2021, pg. 98)? It is not an impossible vision, as evidenced by the implementation of quieter roads in national parks (Wines 2018). The mediation of sound in both technology and the Anthropocene allows us to think of this future not just as a potential but as a reality.

Death of the Art Piece

What is art if not one of the most treasured forms of memory object? Art is a way to capture beliefs, tradition, and stories in a single and collective moment, a small and grandiose scale of time. Art, along with ancient coins and manuscripts and weapons, is associated with permanence. And yet, art can also be carved from bones, structured from dead coral, and made of materials meant to decay.

Of course, if art is meant to die, that also means we can find it in things that are alive. Zurr & Catts (2023), creators of bio-art pieces that use living tissue, claim that "living things exist as cultural objects in all human societies throughout history", and it was only as technology became intertwined with biological scientific advancement "that artists started to experiment, in a serious yet playful way, with the manipulation of living biological systems, organisms and their parts" (Zurr & Catts, 2023, pg. xi; pg. xii). The use of biology and technology to create semi-living statues made of cells or fungi might sound like the prelude to a Frankenstein narrative, but it is also symbolic of the way technology and automation do not exclude life but enhance it.

To use life in art is to create a practice where, “through hands-on immersion in the messiness of life, new meanings lead to new language which may lead to further articulations and understandings” (Zurr & Catts, pg. 129). Because art is a field so focused on intrinsic rather than capital value, bio-art removes the idea of life as “raw material for human use, exploitation and extraction of value” (Zurr & Catts, pg. 132).

Indeed, Smykowski & Stobiecka (2022) argue that the Anthropocene is best represented by objects which can “emerge in the course of ecological processes of decomposition, decay and loss” (pg. 342). An art installation that can die, either through biodegradation or by quite literally dying, creates a memory object that properly encapsulates loss. Rather than thinking about humans manipulating nonhuman life, however, Smykowski & Stobiecka focus on nonhuman life as an agent in decaying human memory objects: they focus on the bioincrustations formed on human moments as an example of future heritage having the right to “1) live outside the human agency and 2) decompose within the living environment” (pg. 362). Embracing the ability of objects to decay helps “establish emotional resilience” within an era defined by loss (pg. 362).

Is decay so terrible, then? Are memory objects that are made to live and then be forgotten really worse than the immortality of plastic, space waste, and irreversibly transformed landscapes? To embrace decay is also to embrace degrowth, where “the economy would be reoriented from production-for-exchange and industrial ‘growth’ to production-for-use and increasing the bio-psycho-social well-being of people and planet” (Owens, 2016, para. 15). DeSilvey argues that decay of human memory in favor of ecological memory is “to understand change not as loss but as a release into other states, unpredictable and open” (pg. 3). When the

drive to forever produce is replaced by production made to decay and a world made to understand loss, the ecological system so terribly affected by the Anthropocene can move on, and the memories of the lost will help inform the new.

Narrative Game Text and Images

This section is copied from Twine and doesn't read well as a textual document. It might feel a bit like reading a script for a TV show but all the episodes are in the wrong order. I am putting it here so that the game's text is accessible even if its interactivity is not, should the game itself ever stop working. If you see a lot of strange characters or weird spacing, that is intentional—this is copy and pasted from the Twine code in order to keep the mark-up and hypertext links correct if you were ever to copy and paste this into another Twine game. The images will also be formatted as figures at the beginning of the sections they originally appear in the game, making it easier to see the figures and give proper image credit in a PDF form (or proper copyright information for the copyrighted images).

Ravaaga

Figure 1: Ravaaga (Staines, 2019)

(if: $ravaaga is true)[<p

style=“color:#78e1eb;”>[Futurist]</p>The cold breath of your homeland welcomes you. It is not yet winter, and it is pine needles that crunch under your tires instead of snow. You stop to take in the view; the pine forests unfurl down the mountainside, halted by a bright city nestled in the mountain valley. In any other direction, Ravaaga is nothing

but empty, industrial pits, but here in the center, in your hometown, it still carries an air of quaint mountain life.](else:)[The air is colder up here. Great rock faces rise up on either side of you. It is not winter yet; the pines are still clear of snow, and you can safely bike along the mountain trails leading away from the city in the valley's center.]

On one of the more overgrown trails is a sign that directs you to [[The Museum of Progress->Museum of Progress]].

However, if you go further north, you will reach [[the mountain peak->The Mountain Peak]].

Then again, if you choose to head south, you could visit [[the extraction sites->Extraction Sites]].

Museum of Progress

Figure 2: Museum of Progress (Martinez, 2019)

The Museum of Progress was made in a more hopeful time, when Ravaaga declared itself a leader in technological and economic prowess. It used to be split into two wings: [[The Space Race]] and [[The Machines of Industry]]. When the kinds of progress the museum celebrated became a dirty thought in public conscious, a third wing was added: [[The Art of the Aftermath]].

Nobody runs the museum anymore. The industries that powered its funding petered out as Ravaaga's resources did, and few were keen to preserve the "progress" that led to the nation's

current economic state. Only the third wing is kept alive by the community, while the other wings have been left to rust.

(if: $majaatl is true)[<p style=“color:#b5f280;”>[Orator]</p> The museum is built on a natural plateau traditionally used for the rituals of a religion that no longer exists. Perhaps the reason it is so far from everywhere else is because its planners subconsciously tapped into that space of memory. (unless: $lines contains (“museum”))[(set: $lines to $lines + (a:”museum”))](unless: $log contains (“Old Lines”))[Old Lines has been added to your memory log(set: $log to $log + (a:”Old Lines”))](else-if: $lines’s length is 12)[Your memory log for Old Lines is complete.](else:)[You have learned more about Old Lines.]]

(if: $ravaaga is true)[<p style=“color:#78e1eb;”>[Futurist]</p> You used to work here. You abandoned the museum for the In-Between when it became clear Ravaagans no longer associated their artifacts with hope. But they will be, perhaps even moreso than the mountain range you live on, remnants of how your people lived long after they have died. And that, you think, makes them worth remembering.

One of your old coworkers, the Curator, still offers tours of the museum. You should [[visit her->Curator]].]

(if: $andazi is true)[<p style=“color:#f0c384;”>[Poet]</p> Your friend The Artist spends most of their time in the newest wing.]

The Space Race wing is a reminder of Ravaagans trying to escape their empty quarries and coal-ridden towns. On the backs of metal and trade, they built the finest spacecraft the world had ever seen. The exhibition, or what is left of it, begins with the history of Ravaaga's Space Agency and the excitement of leaving a dying Earth to reside among the stars.

The doors to the rest of the wing are firmly stuck together by an electronic lock. Unlike the rest of the museum, it is in pristine condition, and you could not pry open the door if you tried.

(if: $ravaaga is true)[You fish around in your pockets, and pull out your old employee key card. The doors miraculously open upon swiping it—clearly the funding ran out before they deactivated past employee access.

You enter the wing, greeted with monolithic bodies of spacecraft casting shadows on gouache posters of speculative futures. However, what fills the display cases through sheer quantity is space debris. Once upon an environmental initiative, the Ravaagan government took their relics of waste from the stars in an attempt to clear the cosmos and recycle the expensive metals within. That program ran out of funding, too, and the debris made its way to the museum. Most of it is from decrepit satellites, but others make you slightly more nostalgic: time capsules that never served their purpose, and a piece of the lost International Space Station.

(unless: $log contains (“A Piece of Space Debris”))[One of the displays catches your eye. It is a disc, a record of time, meant to withstand the battering of the cosmos. The Earth’s Memory, they called it. You and the other museum staff held onto it after a desperate Space Agency contacted you, hoping you would preserve it until the government gave them approval to launch. It carries records not just of humanity, but of deep time patterns in weather, soil, and other natural phenomena meant to describe the entirety of Earth’s history to more-than-human entities. The thought was that, if humanity could not take care of the Earth in the present time, perhaps our descendants or any extraterrestrial visitors could use this to remember the folly of the Anthropocene and create memories capable of passing down its warnings.

A lovely piece of cultural memory, and one you know won’t be missed—the Space Agency is long defunct. You pocket the disc for the In-Between.

You enter The Machines of Industry with a quiet, echoing step. Automatic lights, running off some long-forgotten connection to the grid, flicker in the displays. They illuminate I-beam arms and triangle-patterned skeletons. Beneath each mechanical statue is a plaque describing where the machine came from: a mine, a lab, a factory. Their tales of innovation and invention sit in the cold, empty silence.

(if: $hanen is true)[<p style=“color:#f28080;”>[Keeper]</p> An empty display sits in the factory section. You brush the dust off the plaque, but whatever it said has been scratched out (cycling-link: “by the elements”, “deliberately”). You study the supports meant to position whatever machine belonged here. The shape they hold is familiar to you. Familiar to the generations of factory workers you are descended from.

The Curator of the Museum comes up from behind you. “I remember that display,” she says, in somewhat broken Haneni. “It came from Hanen.” She takes furtive note of your clothes. “Perhaps you can find it.”

You probably can. She gives you a rusty key.

“For the factory in the capital.”

You know which capital she means. There is only one city who can be spoken about without its name. You slip the key into your pocket and make a note to visit Jivro, The Capital of your home.

The Art of the Aftermath was a collaborative initiative not just by Ravaagans, but by all affected by the Anthropocene. Modelled after the In-Between, it is meant to hold as many narratives

and counter-narratives as it can fit. Unlike the other two wings, there are people observing the displays. You yourself see sculptures of plastic, paintings of barren landscapes, and woven tapestries of loss.

(if: $andazi is true)[<p style=“color:#f0c384;”>[Poet]</p> (if: $sun’s length is 4)[You and The Artist spend some time catching up, and then bid farewell.](else:)[The Artist kickstarted the process. Their projects are hidden among various nations, but like you, their home is Andazi. After their solar gallery’s funding petered out, they petitioned Ravaaga instead. They are sitting at one of the displays, which appears to be a library of odds and ends.

They greet you with a hug and explain their latest creation: the Library of the Apocalypse. A collection of doomsaying, apocalyptic fiction, and climate art. They gesture to a warped hard drive and say, “This one is mine, but you can’t access it.”

You accept this disappointment and read the rest. The Artist was always good at bringing others together, even across time. As you flip through pre-Anthropocene speculative fiction and ponder the future soundscapes playing in your ear, you think about how Anthropocenic trauma has become the dominant memory narrative of your world. Perhaps, you think, as you watch

the visitors of the museum crowd into The Art of the Aftermath, there is a more hopeful unifying factor hidden within it.

You end your exploration of the wing at an image of the red sun. The Artist says, “The Ravaagans call it the Wildfire Sun.”

Figure 3: Print of a wildfire sun (Ingram & Tosswill, 2021)

This image was removed because of copyright restrictions. It depicted an art print of Edmonton’s wildfire red sun from the book *Alice and Antius*. Original source: Ingram, K., & Tosswill, B. (2021). *Alice and Antius*, page 36. Image photographed by Michaela Morrow, courtesy of Bruce Peel Special Collections, 2022.

(unless: $sun contains (“alice”))[(set: $sun to $sun + (a:”alice”))](unless: $log contains (“Anthologies of the Red Sun”))[Anthologies of the Red Sun has been added to your memory log.(set: $log to $log + (a:”Anthologies of the Red Sun”))](else-if: $sun’s length is 4)[Your memory log for Anthologies of the Red Sun is complete.](else:)[You add another sun to your anthology.]

(if: (visited: “EmptyGallery”))[](else:)[The Artist notices your log has some room. “If you are looking for more,” they say, “I think the solar gallery hasn’t been cut off the grid yet. Do you remember my old project by the hoodoos? You can collect it, if you want.”]]](else:)[Someone is

folding origami and throwing it into one of the displays. The Artist looks up at your approach and gestures for you to add to the display as well. You gently crease the paper, its fibres thick and apparent, and make a (cycling-link: “crane”,”frog”,”flower”). The Artist is satisfied with your work, and chucks it into the growing assortment of materials.

The two of you spend some time reminiscing about the old days, you discussing your work in The Space Race and her, the filing away of older artifacts in favor of the new.

She wistfully asks, “Do you remember the beads? Children used to collect them on the way up here. I always wondered what memories they held.”

You nod. You do remember the beads, from the archaic humans of Ravaaga, whose traces are left across the country. Those Pleistocene memories were her speciality, not yours.

“I’d love to see one again—not in storage, but in the hands of someone who wants to be educated.” Her eyes pointedly peer at you.

Pleistocene-Oriented Programming has been added to your memory log.(set: $log to $log + (a:”Pleistocene-Oriented Programming”))](else-if: $bead is true)[Her keen eyes are immediately drawn to the stone bead in your hand. She gestures for you to give it to her.

She is a master of memory, and tells you about the role of the Pleistocene Object. Archaic humans had brains unknowable to us, and possibly did not even have language to communicate—but they still had collective knowledge. This knowledge was embedded in external memory storage unknowable to us. Why did they shape the beads the way they did? What did the designs represent? Why were they worn? They are questions with no answers, the information inscribed on their stone surfaces unknowable to our methods of information retrieval.

And yet, she says, and yet. Do we not create things full of information, with nothing but a collective and agreed upon knowledge system to retrieve that information, to make sense of it? Archaic humans, to her, are not so different. And she reminds you that we will one day be nothing but skeletons if we are lucky enough to be preserved, and our artifacts—whether it be the impression of a plant, the ruins of a factory, or the miraculous information network of the digital realm—these rely on how we pass knowledge and memory to each other. How will the future create narratives about our present, when they cannot retrieve the information we embed in our products?

She hands the bead back to you, letting you think about the death of human cultural memory.

(unless: $curator is true)[(set: $curator to true)]Your log entry for Pleistocene-Oriented Programming is complete.](else:)[She patiently awaits your discoveries.]

Mountain Peak

Figure 4: Mountain Peak (Gabe, 2017)

In the thin air you are greeted with a spectacular view. Valleys of pine stretch to the horizon, broken up awkwardly by the voids mined into the earth. You take a moment to rest after your upward climb.

(if: $majaatl is true)[<p style=“color:#b5f280;”>[Orator]</p> To your left is [[the community centre->CollectiveMountain]], a place that contains memories of nature. You’ve been here before as part of the community centre’s founding—you were responsible for researching how to create ecologically friendly hiking trails based on the mountain communities who once lived here. (unless: $lines contains (“peak”))[(set: $lines to $lines + (a:”peak”))](unless: $log contains (“Old Lines”))[Old Lines has been added to your memory log(set: $log to $log + (a:”Old Lines”))](else-if: $lines’s length is 12)[Your memory log for Old Lines is complete.](else:)[You have learned more about Old Lines.]](else-if: $ravaaga is true)[<p style=“color:#78e1eb;”>[Futurist]</p>Some of the mines were once archaeological sites. A prehistoric living space, thought to belong to a prehuman species, was destroyed in a mining accident. Ravaagans found this a loss of progress—after all, what does the future mean if there is no past to compare it to? Ravaaga, for all its industry, was always stuck on the past. Antique dealers once combed these mountains for prehistoric beads from the same civilization.

(unless: $bead is true)[(set: $bead to true)

Figure 5: Fossil bead (Paterson, 2013)

This image was removed because of copyright restrictions. It depicted a bead from Katie Paterson's Fossil Necklace possibly from the Pre-Cambrian Era. Original source: Paterson, K. (2013). Fossil Necklace – Bead 003 [Pre Cambrian Era]. *Katie Paterson,* https://katiepaterson.org/artwork/fossil-necklace/. Accessed February 20, 2024.

You don’t know much about them, yourself, but you can recognize a bead when you see one. You spy one poking out from your tire tracks. You wipe the dirt off and pocket it, knowing The Curator from the museum you used to work at would tell you more about it.

This particular centre was built in Ravaaga’s golden age of innovation. Tourists and natives alike are encouraged to upload their memories of the mountain to its digital archive through the Memory Machine. A valuable place to explore, for a collector of memories. You step inside the machine.

[[Listen to a recording.]]

(if: (visited:”Listen to a recording.”))[[[View a picture from the peak.]]]

(if: (visited:”View a picture from the peak.”))[[[Read a tourist’s guide.]]]

(if: (visited:”Read a tourist’s guide.”))[[[Remember the voice of the mountain.]]]</tw-passagedata><tw-passagedata pid="53" name="Listen to a recording." tags="" position="350,1175" size="100,100">{(unless: (track: ‘hikers’, ‘isplaying’))[

(masteraudio: ‘stopall’)

(track: ‘hikers’, ‘fadein’, 1)

]}</tw-passagedata><tw-passagedata pid="54" name="View a picture from the peak." tags=""

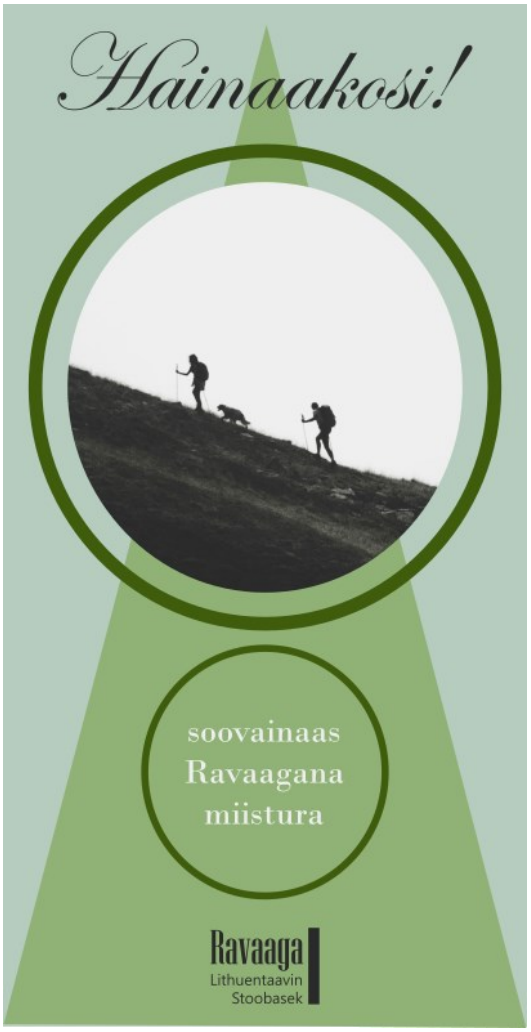
position="300,1175" size="100,100">

Figure 6: View from a mountain (Acea, 2019)

tw-passagedata><tw-passagedata pid="55" name="Read a tourist’s guide." tags=""

position="400,1175" size="100,100">

Figure 7: Hiking pamphlet with image from Conti (2018)



tw-passagedata><tw-passagedata pid="56" name="Remember the voice of the mountain."

tags="" position="475,1175" size="100,100">{(unless: (track: ‘mountain’, ‘isplaying’))[

(masteraudio: ‘stopall’)

(track: ‘mountain’, ‘fadein’, 1)

]}

The Mines/Extraction Sites

Figure 8: Bucket extractor (Münch, 2022)

(if: (count: (history:), “Extraction Sites”) is >=1)[](else:)[This location has been added to your map.

]The mine stretches deep into the earth. You cannot see the bottom, nor the other side of it. If you yelled into it, your voice would be swallowed.

(if: $ravaaga is true)[

<p style=“color:#78e1eb;”>[Futurist]</p> The mine grew in phases: iron for swords, copper for wires, uranium for bombs. Deeper and wider it became, until it swallowed the trees and towns alike. You feel like you could walk through every layer of the [[Earth’s crust->Silurian1]] if you tried.]

(if: $hanen is true)[<p style=“color:#f28080;”>[Keeper]</p> (unless: $log contains (“Photos of Scars”))[The sublime threatens to overwhelm you. The misery of this place is an abyss, incomprehensible and empty all at once. But you must steel yourself. Is this not, in its own way, a form of waste? Nothing more than a hole in the ground that has served its purpose, and yet will remain forevermore?

The scale of such things are best captured from a god’s-eye view. You once experimented with aerial photography—a friend from Andazi used to fly you around in his plane funded entirely by desert tourists. The tourism died out, but your friendship with The Pilot remains.

Photos of Scars has been added to your memory log.(set: $log to $log + (a:”Photos of Scars”))](else-if: $pilot is true)[The Pilot waits a small distance away, waving to you from the cockpit. You climb in, camera at the ready, and [[take to the skies.->Aerial]]]]

(if: $majaatl is true)[<p style=“color:#b5f280;”>[Orator]</p> You can no longer tell what this place used to be. The landscape is bereft of its own distinguishing features. All that is left is the mine. You hope that one day, life will find a way to live with it.

You take your first step into the mine. The ancient elevators still work. Your feet echo on the metal as you begin your descent to the (link-reveal: “second layer.”)[{(track: “footstep”,”fadein”,1)}

The air grows warmer as darkness swallows you. Glinting stone flashes for a moment, or maybe your eyes are just playing tricks on you. Your vision adjusts and you realize the elevator has stopped at one of the old administrative rooms. A rusted nameplate sits on one of the desks, its owner’s title lost to time. You take it as a monument to the mine and (link-reveal: “continue on.”)[{(track: “footstep”,”fadeout”,0.5)(track: “elevator”,”fadein”,1)}

However many levels later, you find an abandoned extractor. Its rigid metal body stretches deeper into the mine, an ersatz skyscraper confusing your sense of scale. Bioluminescent fungi has begun to flourish on its claws. Another monument to the mine, but one you leave in its place. You (link-reveal: “go deeper.”)[(track: “elevator”,”fadeout”,0.5)(track: “geiger”,”fadein”,1)

Perhaps it is too deep. You hear the voices of people that were or will be, murmuring about an oddity in the Earth's crust, a stratigraphic layer with all the typical signifiers of climate change but more: more radioactive decay, more synthetic materials. This, too, is a monument, like the stone monoliths of ages past compressed into one layer in the (link-reveal: "Earth's Record.")[(track: "geiger","fadeout",0.5)(track: "static","fadein",1)

The heat is overwhelming now. You stumble through the darkness, hands grasping for ancient footholds, the insurmountable walls of the mine closing around you, the penetrated and shifting stone its own (link-reveal: "eternal monument.")[(track: "static","stop")(track: "mineambi","stop")

And then, with a gasp, you realize you have climbed back out into brilliant sunlight. You check yourself for injuries, but all you find is odd dust on your hands.

You and The Pilot slowly circle the mines. You capture the pockmark it leaves on the Earth's crust.

(link-reveal: "Click.")[(track: 'camera','play')

Figure 9: Aerial view of a mine (Burtynsky, 2007)

This image was removed because of copyright restrictions. It is a photograph of a mine taken from an aerial perspective by Edward Burtynsky. Original source: Burtynsky, E. (2007). Silver Lake Operations #2. *Edward Burtynsky*, https://www.edwardburtynsky.com/projects/photographs/mines. Accessed February 20, 2024.

He takes the plane further north. You can see the crags of permafrost deposits on the ground, revealed by global warming and invasive farming.

(link-reveal: “Click.”)[(track: ‘camera’,’play’)

Figure 10: Aerial view of a permafrost crater (Orlinsky, 2019)

This photo was removed because of copyright restrictions. It depicted the Batagaika crater’s permafrost thawing from an aerial view. Original source: Orlinsky, K. (2019). The Batagaika crater in eastern Siberia. In *National Geographic*, https://www.nationalgeographic.com/environment/article/arctic-permafrost-is-thawing-it-could-speed-up-climate-change-feature?loggedin=true&rnd=1709488586817. Accessed February 28, 2024.

The air is colder. The Pilot wipes away the frost from the windows. Below you are melting ice caps.

(link-reveal: “Click.”)[(track: ‘camera’,’play’)

Figure 11: Aerial view of melting ice (Isaacson, 2021)

He circles back around and lands you at the precipice of the mine. You review the photos together. After a moment of silence, he tells you to make the time between your visits shorter.

Majaatl

Figure 12: Majaatl (Johnston, 2019)

Humidity seeps into your skin. Where there was once cool underbrush, there is now a muddy path leading deeper into the trees. Sweat beads form as you climb the rising terrain.

The farther south you go, the more the ocean breeze cuts through the heavy, wet air. To the north are sine wave mountains, where wild rice has been moulded by terraced farms.

To the [[rice->Flooded Terrace]].

To the [[river->River of Retellings]].

Enter the [[contested zone between Hanen and Majaatl.->The Contested Zone]]

The Flooded Terrace

Figure 13: Rice terrace (Beugels, 2023)

Rivers wind down the green hills of Majaatl. The echoes of paddies are carved into the hill, but the increasingly unpredictable flooding has made many of the terraces nothing more than a stairway.

One of the farmers raises her head as you weave through the patties. (if: $majaatl is true)[<p style=“color:#b5f280;”>[Orator]</p> The mist settles on her home like a blanket. You make your way up the carved slopes, thinking about the natural trickle of water that makes such farms possible. (unless: $lines contains (“rice”))[(set: $lines to $lines + (a:”rice”))](unless: $log contains (“Old Lines”))[Old Lines has been added to your memory

log(set: $log to $log + (a:”Old Lines”))](else-if: $lines’s length is 12)[Your memory log for Old Lines is complete.](else:)[You have learned more about Old Lines.]As you navigate the old lines, you approach the woman. You greet her in Majaatl and [[ask her about stories of nature->TaleRiver1]].](if: $andazi is true)[<p style=“color:#f0c384;”>[Poet]</p> You look up and see that the smog drifting from Hanen has created a hazy red sun over the fields. You simply write “the red sun drifting / over flooded fields of rice / stains the ground with blood” into your memory log.(unless: $sun contains (“haiku”))[(set: $sun to $sun + (a:”haiku”))](unless: $log contains (“Anthologies of the Red Sun”))[Anthologies of the Red Sun has been added to your memory log.(set: $log to $log + (a:”Anthologies of the Red Sun”))](else-if: $sun’s length is 4)[Your memory log for Anthologies of the Red Sun is complete.](else:)[You add another sun to your anthology.]]

(if: $majaatl is false)[You do not speak her language, so you only wave.]

The Kitsacha river did not always shed its skin so rapidly. It used to swell in the wet season, threatening to drown the settlements along its life-giving waters, and calm in the dry season, when children could splash in the banks. The seasons were once predictable; now, the river cannot tell the difference between cracked mud and flowing paddies. Our flood waters were quelled by a foreign god who understood nothing but trees, and our rice suffered as a result.

The river was once the shape of the glorious carp. It raged and played in equal measure, and its scales reflected rainbows. But you have seen yourself that the carps lose themselves in the strange new mud. The river, too, was losing itself. It lost its fins, and then its color. It became a serpent crawling on its belly. It hid here, in the rice fields, preying on lowly pests to survive, its rushing waters now a weak trickle. What has the serpent become? What will it become? Perhaps returning to the brilliant carp is no longer attainable. We must learn how to lose the serpent as well.

River of Retellings

Figure 14: Riverside town (Lundqvist, 2017)

(if: (count: (history:), “River of Retellings”) is >=1)[](else:)[This location has been added to your map.]

The cultural heart of Majaatl is not in its cities but in its riverbanks. The River of Retellings is the Kitsacha river in space and an ever-changing convoy of boats in place. Here is where people gather to pass stories, news, and greetings. Despite the gradual weakening of the river's waters—from unpredictable climates, foreign dams, and invasive agriculture—the people still rely on its communal power.

Surrounding the floatilla is a curated garden of native plants. After Hanen's colonial march towards Majaatl, this zone was designated as a place of natural heritage. The flowers and trees that grow here are crucial not just to the humans of Majaatl, but the animals and insects as well.

(if: $majaatl is true)[<p style="color:#b5f280;">[Orator]</p> You trace the tree bark with your fingers and take a moment to remember the forests your ancestors played in. (unless: $lines contains ("river"))[(set: $lines to $lines + (a:"river"))](unless: $log contains ("Old Lines"))[Old Lines has been added to your memory log(set: $log to $log + (a:"Old Lines"))](else-if: $lines's length is 12)[Your memory log for Old Lines is complete.](else:)[You have learned more about Old Lines.]](if: $ravaaga is true)[<p style="color:#78e1eb;">[Futurist]</p>Take a moment to [[smell the flowers.->ExtinctFlower1]]]

Head to the [[Floating Theatre. -> Floating Theatre]]

The Floating Theatre

The Floating Theatre is the grandest boat in the floatilla, perhaps because of Majaatl's love for performance. You approach its splendor and take a look at the current selection. (if: $majaatl is true)[[<p style="color:#b5f280;">[Orator]</p> Seek out a storyteller.->RiverStoryTeller]]

(if: $ravaaga is true)[<p style="color:#78e1eb;">[Futurist]</p> A new play catches your eye: one based off the story [["Rituals for Flowers"->Rituals for the Extinct]], a speculative work of fiction that envisions prehuman societies. The play is luckily silent, so you do not need to understand Majaatl if you were to watch it.]

(if: $andazi is true)[<p style="color:#f0c384;">[Poet]</p> With your paltry Majaatl reading comprehension, you notice a performance titled [[A Dance for the Burdened Play]]. This one can probably be enjoyed by a foreigner.]

(if: $hanen is true)[To be honest, most of them require understanding Majaatl. Perhaps there are one or two that can be enjoyed without words, but you are not interested in the subject matter. You soak in the ambience of the theatre before you head back out on your mission.

The theatre is a place where young and eager storytellers choose to rework old myths into new shapes and forms. You spy a girl hoping for an audience.

You ask for a tale. She nods, and begins her version of the [[Tale of the Shapeshifting River]], a story that has been told many times over by many people, but has changed so rapidly in The Aftermath.

(unless: $log contains (“The Shapeshifting River”))[The Shapeshifting River has been added to your memory log.(set: $log to $log + (a:”The Shapeshifting River”))]</tw-passagedata><tw-passagedata pid="31" name="Tale of the Shapeshifting River" tags="majaatl" position="1025,1575" size="100,100"><h3>musings from a past carp</h3>{(unless: (track: ‘musings’, ‘isplaying’))[

(masteraudio: ‘stopall’)

(track: ‘musings’, ‘play’)

]}

by Andy Zhang, 2024

last summer

god caught me

with a flamingo feather wrapped around

a hooked finger

I must have flopped, thrashed, and gasped too much

cause she

wrung me

twisted me

and stretched me

until skin was one

and lungs were full

I hissed

and in her surprise, slithered between tiny fingers

into

the

grass

I miss how my scales used to fall

one by one

drifting like pollen

and how the sun

shimmered

without burning

yet these murky depths unknow themselves

and the thought of drowning

frightens me

You settle into your worn wooden seat. A woman steps onto the stage, dressed in a theatric imagining of prehistoric clothing. She acts out various scenes from the original tale: archaic humans settling along a river; flood waters sweeping their belongings away; white flowers growing from the effluvial mud.

The archaic human—the woman performer—picks the flower. Based on her movement, it has a sweet scent. She brings it close to her face, cradling it gently, and places it on the remains of her people. The play continues, and the people rebuild.

This is where the original story ends. But here, in the space of theatre, the archaic humans slowly disappear. The flower, too, dies out as the river dries up. And then, on the ancient floodplain, the first humans arrive. The play ends, and you are not sure whether to clap.

Figure 15: Ruin dance (McDowell & Saykaly, 2012)

This gif was removed because of copyright restrictions. It depicted a woman dancing in crumbling ruins. Original source: McDowall, D., & Saykaly, D. (2012). PAINTED. *YouTube*, https://www.youtube.com/watch?v=Pd2KM3qjcKk. Accessed February 28, 2024.

Figure 16: Hulu at burning man (Worobec, 2022, Courtesy of Makuakāne)

This photo was removed because of copyright restrictions. It depicted an Indigenous Hawai'ian dance group at Burning Man. Original source: Worobec, R. (2022). Nā Lei Hulu i ka Wēkiu at Burning Man in the Nevada desert. In *Dance Magazine*, Courtesy of Makuakāne, https://www.dancemagazine.com/hula-today/. Accessed February 28, 2024.

Figure 17: Crested ibises dance (Gong, 2020)

This photo was removed because of copyright restrictions. It depicted a performance of the Chinese ballet *Crested Ibises*. Original source: Gong, T. (2020). Image of a performance at Shanghai Dance Theater of *Crested Ibises.* In *Shine*, https://www.shine.cn/feature/art-culture/2008285061/. Accessed February 28, 2024.

Figure 18: Hydraulic movement (Eriksen, 2021)

This gif was removed because of copyright restrictions. It depicted one of the hydraulic pipes used in Eriksen's (2021) Anthropocene sculpture with water flowing through it. Original source: Eriksen, Marcus (2021). The Making of the Anthropocene sculpture. *YouTube,* https://www.youtube.com/watch?v=MmRjXnGT2oc. Accessed February 28, 2024.

Figure 19: Metalwork (Eriksen, 2021)

This gif was removed because of copyright restrictions. It depicted a close-up of metal work with metal scraps bouncing on the table due to a hammer's movement. Original source: Eriksen, Marcus (2021). The Making of the Anthropocene sculpture. *YouTube,* https://www.youtube.com/watch?v=MmRjXnGT2oc. Accessed February 28, 2024.

Figure 20: Planting tobacco (Lynch, 2022, Courtesy of Socrates Sculpture Park)

This photo was removed because of copyright restrictions. It depicted two audience members planting tobacco sprouts as part of an outdoor art performance by Emily Johnson. Original source: Lynch, S. (2022). Audience members planted tobacco seedlings during a performance of *The Ways We Love and the Ways We Love Better—Monumental Movement Toward Being Future Being(s).* In *Dance Magazine*, Courtesy of Socrates Sculpture Park, https://www.dancemagazine.com/emily-johnson/. Accessed February 28, 2024.

Figure 21: Dancing in plastic (Lemberger, 2021)

This photo was removed because of copyright restrictions. It depicted three women in plastic bag dresses dancing on a city street. Original source: Lemberger, J. (2021). Image of street performance of Jody Sperling's *Plastic Harvest. The Dance Enthusiast*, https://www.dance-enthusiast.com/features/impressions-reviews/view/IMPRESSIONS-Jody-SperlingTime-Lapse-Dances-Plastic-Harvest-at-Amsterdam-EcoArts-Festival-. Accessed February 29, 2024.

Figure 22: Plastic in dance (Oxford Playhouse, 2021)

This gif was removed because of copyright restrictions. It depicted a female dancer artfully picking a piece of plastic from a shrub. Original source: Oxford Playhouse. Making of Anthropocene – Part 2. *YouTube,* https://www.youtube.com/watch?v=Qd6AtARjB8M. Accessed February 28, 2024.

The Contested Zone

Figure 23: Flooded houses (Gottardi, 2017)

(if: (count: (history:), “The Contested Zone”) is >=1)[](else:)[This location has been added to your map.

]In the fuzzy border between Hanen and Majai is the contested zone. Call it a colony of Hanen, or a missing piece of it—all it is now is a place whose riches in lumber, lie in piles of rubble. The people who live here have simply called it home.

(if: $majaatl is true)[<p style=“color:#b5f280;”>[Orator]</p> Your hometown used to live off the Kitsacha river. After the war its main industry was forestry. You ignore the remains of the places that used to be and visit the river bank. It was the center of every town and its waters flowed in every culture. They held memories of war, but also rebuilding. Water was the old way in which Majaatli defined themselves. (unless: $lines contains (“zone”))[(set: $lines to $lines + (a:”zone”))](unless: $log contains (“Old Lines”))[Old Lines has been added to your memory log(set: $log to $log + (a:”Old Lines”))](else-if: $lines’s length is 12)[Your memory log for Old Lines is complete.](else:)[You have learned more about Old Lines.]

If you head to the clearing, you will probably find your grandfather musing about the same things.]

(else-if: $hanen is true)[<p style=“color:#f28080;”>[Keeper]</p> The government hoarded everything in Hanen. It was easy for them to claim more land was necessary when most people didn’t see the wealth of the land they were already standing on.

](else-if: $ravaaga is true)[<p style=“color:#78e1eb;”>[Futurist]</p> Examine the dried herbs decorating one of the homes. It reminds you of one of the most ancient forms of preserving tangible memories—that of the herbacious fossil, impressed in ancient mud. [[You take a closer look->ExtinctFlower2]].]

Go further west to the [[Deforested Clearing]].</tw-passagedata><tw-passagedata pid="18" name="ExtinctFlower1" tags="majaatl" position="1425,1175" size="100,100">You stop to

admire the flowers. Their clean scent cuts through the otherwise humid air. Each of these flowers were handpicked for preservation, and their seeds lie hidden in a bank protected by the Majaatl people should they ever go extinct. You wonder, briefly, about the ones that didn't make it—the flowers whose ecological impact was imperceptible to the human eye, either because they grew in a place where humans didn't live or had already been trampled on before humans even existed.

As you ruminate on flowers long gone, something sharp and clear cuts through the scented medley. You try to capture the feel of it—and then it's gone.

(unless: $flower contains ("scent"))[(set: $flower to $flower + (a:"scent"))](unless: $log contains ("The Scent of an Extinct Flower"))[The Scent of an Extinct Flower has been added to your memory log(set: $log to $log + (a:"The Scent of an Extinct Flower"))](else-if: $flower's length is 3)[Your memory log for The Scent of an Extinct Flower is complete.](else:)[You have learned more of flowers in Majaatl.

When Hanen planted invasive trees in Majaatl, they also cut down the ones made for holding floods back. You look upon the clearing, now a mosaic of concrete buildings and foreign trees drowned in stagnant waters—waters that once would have been drained by the native flora. This place is a lake of colonial scarring.

An old man is fishing in these waters, though his success in such a place is debatable.

(if:$majaatl is true)[<p style=“color:#b5f280;”>[Orator]</p> You greet your grandfather in Majaatl, knowing he is less interested in fishing than spending time on the water. He has lived on them for a long time, and spent many years listening to their stories.

He helps you into the boat, as if you are not capable of it yet. The two of you drift along the buildings, his fishing line forgotten. For old time’s sake, you ask him about the [[flood waters]].]

(else-if: $hanen is true)[<p style=“color:#f28080;”>[Keeper]</p> Seeing that you have no boat, he gestures for you to get in. You accept and he paddles you to the [[Old Server Farm]].]

(else:)[The humidity and the ruination weigh heavy on you, and you do not speak this man’s language. It is time to leave.]

You can tell the dried herbs are ones for food and medicine. They still give off the briefest of scents. Upon closer examination, you realize one of the herbs, more shrivelled than the rest, no longer grows in this area. Majaatl has so many niche ecosystems, it is likely this herb doesn’t grow anywhere at all. As you breathe in its warm scent, you wonder what other ecoscents no longer exist.

Figure 24: Servers (Hanaoka, 2020)

(if: $hanen is true)[The flooded server farm greets you, dominating the flooded landscape and carving out a perfect city block of space for itself. You thank the old man as you wade towards its entrance. The erratic remains of the farm's electronic systems hold the doors tight, but with enough prodding and prying you get it open.

As you enter, you are aware of how humid it is. This place once sucked up all the cool air in Majaatl to power the hundreds of servers that create the corridors you walk through. No longer protected from the elements, this place is nothing but a shrine to waste.

You head into the farm's innards, examining the cooling systems. Something corrosive is leaking from it. Best not to touch anything, and leave this place of the dead.

Your grandfather smiles and points to the wide estuary of the Kitsacha River. "This river," he says, "is the shape of a serpent. It has shed its skin many times and become unnaturally smooth. If you are willing to swim through the mud like a carp, you may find its old skin."

"The serpent was marred by hunting marks. Not from the Majaatli, but from the foreign hunters, who saw snakes in their rice and did not understand. The serpent had to shed many times to keep its scales as shiny as they were before it became such a lowly, hunted creature."

"And so it shed many times. So often that it lost its sense of self and could not remember what purpose it served for its community. Perhaps it will have to become something other than a serpent, for it so desperately wants to help."

He places a hand on your cheek. "I am sure you will be there to watch it transform into something glorious again."

Hanen

Figure 25: Fields (Testa, 2016)

The halls of the In-Between give way to a vast expanse of hills and fields. From here, you can see the hues of wheat-yellow farms and dusty grey roads. Beyond lie cities of great industry. Their buildings stretch across the horizon like geometric mountains, and their factories belch out a cloud cover of smog.

Head towards [[the city->The Capital]].

Meander through [[the old highway->A Road Well-Travelled]].

Turn away from the city and explore the [[rural farming collective->Community Farms]].

The Capital

Figure 26: Manchester and any city (Curry, 2021)

(if: (count: (history:), “The Capital”) is >=1)[](else:)[This location has been added to your map.

]They call Jivro the beating heart of Hanen. The city has stood for nearly a thousand years. The jury is out on whether it will stand for a thousand more, seeing as it has sucked dry the fertile fields that once sustained it and paved over the salt mines that made it into an empire. Your

lungs weighed down with smog, you pedal across the bridge that leads into Jivro's claustrophobic streets.

Along the narrow corridors, you see buildings guarded by spray-painted wood—(if: $hanen is true)[<p style="color:#f28080;">[Keeper]</p> "Biohazard", it says, reminding you the pandemic is fresh in the memories of this place rife for spreading illness.](else:)[you can't make out the writing, but you can recognize the universal signs for a biohazard.

]

(if: $majaatl is true)[<p style="color:#b5f280;">[Orator]</p> This place feels alien. Maybe it is the urban sprawl or maybe it is, like the biohazard sign, the clear distress of its citizens as seen from the ground. You find a park to sit in. It's still curated, but it's better than the streets. You notice that the park grows the sacred fruit trees of Haneni culture—the ones they tried to plant in Majaatl. Here, they look much more at home. (unless: $lines contains ("capital"))[(set: $lines to $lines + (a:"capital"))](unless: $log contains ("Old Lines"))[Old Lines has been added to your memory log(set: $log to $log + (a:"Old Lines"))](else-if: $lines's length is 12)[Your memory log for Old Lines is complete.](else:)[You have learned more about Old Lines.]]

(if: $andazi is true)[<p style="color:#f0c384;">[Poet]</p> Collect a piece of the wood, put on a mask, and risk entering [[the house->HouseRelics]].]

Give the zones a wide berth and follow [[the source of the smog->Factory]]

The house has long been abandoned. This is the low-income part of the city; likely, the pandemic hit hard and fast in this place of too-small apartments and sewage-heavy flooding. Dust coats the furniture. You can safely assume the government was too busy sanitizing the homes of the affluent to remember removing the biohazard signs on this residence.

You spot a drawing on the kitchen table. The charcoal lines are partially faded, but you can make out the image of a sick man on a bed. Someone who lived here, perhaps, trying to document the trauma illness wreaks on a family.

The factory's black gates greet you. Any worker of the In-Between knows it was the first of its kind, built to produce (cycling-link: "textiles", "canned goods", "plastic bottles", "bombs", "chemicals", "electronic chips", "plastic iconography", "everything"). No one works here any longer. Their labour has been replaced by robots, machines, and algorithms. Perhaps, considering the nature of factory work, that was for the best.

(if: $hanen is true)[<p style="color:#f28080;">[Keeper]</p>
Your family worked here once, alongside other second-class citizens and undesirables. The clang

of automated metal echoes in your blood, and yet you have never heard it. You examine the gate. (if: $rkey is true)[There is a lock perfectly made to fit the key The Curator gave you. With a rusty screech, the gates open and you [[walk inside->Machine]].](else:)[An ancient padlock sits upon it. You recall that the owner closed the factory down after agreeing to donate materials to Ravaaga's Museum of Progress. Perhaps you should see what they have to say about it.

A Road Well-Traveled

Hanen was an empire for a thousand years. The road you ride on was made of dirt before it was made of stone before it was made of concrete, a sprawling network of trade and war. As the road was built, the earth became tilled and the land became "civilized". Hanen liked building things—it is easy to stumble across something made by human hands no matter where on the road you go.

(if: $hanen is true)[<p style="color:#f28080;">[Keeper]</p> If only the love of conquest had ended before the Anthropocene. Instead, when the Haneni looked at acres and acres of destroyed land, at the crux of their industrial progress and at the peak of a class crisis, they turned back to their old ways. Majaatl—that land so rich in natural resources—was to become the newest expansion of the empire. If they had ever stopped building, they might have been able to save themselves.

]

Examine the [[ruins up ahead.->Ruins1]]

(if: $hanen or $majaatl is true)[Make your way to [[The Contested Zone]] between Hanen and Majaatl.]

Figure 27: Factory (Herrmann, 2021)

Pale grey light filters through the shattered skylights. Squinting your eyes, you see the place has been stripped bare—a result of bits and pieces being repurposed, vandalized, or donated to museums.

(link-reveal: “And yet.”)[The overheard fans whir. The conveyer belts meander through their cycle. And there, in a small and forgotten corner, is an automata mindlessly moving its hands for a task long rendered obsolete.

You approach the automata. It reminds you of—you. Something pushed away, performing the tedious task of production, and yet it still goes on. How easily the have-nots of Hanen became reduced to labour. How easily the glory of industry was built on the backs of the forgotten.

After a bit of time searching the backrooms, you finally find the power lever. You pull it down. The conveyer belts rumble to a stop, and the fans slow to a (link-reveal: “crawl.”)[(track: ‘factory’, ‘fadeout’,3)

The automata continues its task.

Ruins

Figure 28: Modern ruins (Barrett, 2018)

(if: (count: (history:), “Ruins1”) is >=1)[](else:)[This location has been added to your map.

](if: $ravaaga is true)[(unless: $log contains (“(Un)recognizable Ruins”))[

(Un)recognizable Ruins has been added to your memory log.(set: $log to $log + (a:

“(Un)recognizable Ruins”))]

](if: $majaatl is true)[

<p style=“color:#b5f280;”>[Orator]</p> You can see the mountains that make up Hanen and Majaatl’s natural border from here. You take a moment to stop and envision what it was like to walk to such a place before you could simply go through or

over it with vehicles. (unless: $lines contains (“road”))[(set: $lines to $lines + (a:”road”))](unless: $log contains (“Old Lines”))[Old Lines has been added to your memory log(set: $log to $log + (a:”Old Lines”))](else-if: $lines’s length is 12)[Your memory log for Old Lines is complete.](else:)[You have learned more about Old Lines.]]

You approach a dilapidated building just off the road. In some ways it is pristine: grass and moss have not fully overtaken the structure, and you can still make out the path that led to it. In other ways, it is so broken down that any recognition of what it was is gone.

You scratch off a piece and let the rubble fall through your fingers. Is it stone, or concrete? Perhaps it doesn’t matter, as it has outlasted its creators all the same. Your tampering reveals there is a crack in the wall, large enough for you to squeeze through. Enter the [[interior of the building->TravellerRuins]].

Examine the [[architecture.->ArchiRuins]]

You enter the ruins. To your surprise, someone is already in there. They have a sickly green pallor to their barklike skin texture, and more limbs than you are used to. The creature turns to you and offers... one of the limbs, as best you can tell. It is like shaking a tree branch.

“Hello,” they say. “I’m a Traveller, and I’ve been studying these remains for awhile. Would you be able to speak to their origin?”

(if: $ravaaga is true)[(link-goto:"`[Futurist]` The ruins are new in the grand scheme of things, but ruined all the same. Their origin is that of the capitalist machine, that forgets the materialism of what it leaves behind in the name of progress. But progress means nothing in the context of billions of years.", "TravellerRuins2")

](else-if: $hanen is true)[(link-goto:"`[Keeper]` They're one of many, built in the industrial rush and forgotten just as quickly. Its origin is the same as all the others; progress without thought, and profit without a future. My friend's nation was destroyed in the pursuit of oil, and mine was destroyed in the pursuit of production.", "TravellerRuins2")

](else-if: $majaatl is true)[(link-goto:"`[Orator]` They are like the decrepit trash left behind in your homeland. Colonizers built them and colonizers left them. They hold no meaning to your people and you do not think they hold meaning to the Haneni either.","TravellerRuins2")

](else-if: $andazi is true)[(link-goto:"`[Poet]` They are cheap things made to waste away over time, and yet they will remain as structures devoid of meaning. I wonder if someone in the future will create a better meaning for them; it is what humanity is good at, after all.","TravellerRuins2")

]

[[Return.->Ruins1]]

</tw-passagedata><tw-passagedata pid="25" name="ArchiRuins" tags="hanen" position="1575,750" size="100,100">You circle around the exterior of the building. It is a series of modular squares, like so many things built in Hanen, and its clear the grey brittle walls were once painted with brighter colors. However, any identifiers of what purpose it served have long disappeared. You can only speculate on why it was important, or if it even was.

(if: $ravaaga is true)[<p style=“color:#78e1eb;”>[Futurist]</p> This place is so distant from the hustle of cities. And yet, the encroaching urbanization came here all the same, trying to replace whatever system came before, building by building, ruin by ruin.

(unless: $ruins contains (“ruin2”))[(set: $ruins to $ruins + (a:”ruin2”))](if: $ruins’s length is 2)[Your memory log for (Un)recognizable Ruins is complete.]]

(else-if: $hanen is true)[<p style=“color:#f28080;”>[Keeper]</p> This particular architectual style was a departure from the complex fineries of Hanen’s artistic history. The high class used to build places of beauty and wealth, but when others demanded a share of that wealth, they built cheap dens of squalor and dotted them around the landscape as if to say: “Look. We have given you a portion. See how pathetic money looks when it is not hoarded.” You once spent time with people who lived in the area, and even they could not tell you the purpose of such a place. They were too busy feeding their families to appreciate something meant to crumble.](if: $andazi is true)[<p

style=“color:#f0c384;”>[Poet]</p> You notice some graffiti on the wall. And yet, as you try to read it, the words keep [[disappearing->Poem]].]

[[Return.->Ruins1]]</tw-passagedata><tw-passagedata pid="26" name="TravellerRuins2" tags="hanen" position="1650,750" size="100,100">They nod at your response, presumably filing it somewhere within their record of the place.

(if: $ravaaga is true)[“Your insight is valuable,” the Traveller replies. They glance out, or at least turn to, what was maybe a window. “I suppose this place will eventually be forgotten by even you. Why not stop and enjoy what’s left of it while you can?”(unless: $ruins contains (“ruin1”))[(set: $ruins to $ruins + (a:”ruin1”))]](if: $hanen is true)[“Indeed, this nation has spent a long time relying on things that so easily disappear in the timespan of the universe.” The Traveller eyes you keenly. “And yet, even you remember the traces of things long gone.”

From somewhere within the folds of their form they produce a vial. You take it, examining the substance inside. A glossy rainbow liquid. A refined and beloved material thought long extinct in The Aftermath after the wells in Andazi dried up.

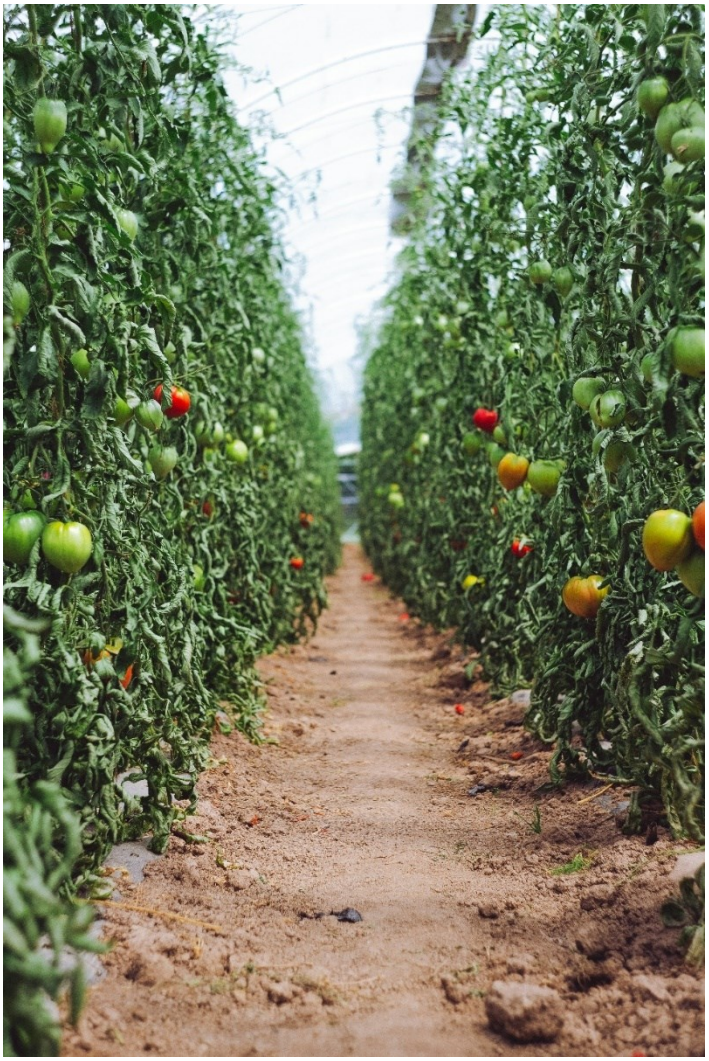
You take the last drop of oil from The Traveller. They say, “You may want to lay this particular trace to rest in the desert from whence it came.” (set: $oil to true)(unless: $log contains (“One

Last Drop of Oil”))[(set: $log to $log + (a:”One Last Drop of Oil”))One Last Drop of Oil has been added to your memory log.]]

Leave the Traveller and [[explore outside.->ArchiRuins]]

Community Farms

Figure 29: Tomato farm (Spiske, 2018)



(if: (count: (history:), “Community Farms”) is >=1)[](else:)[This location has been added to your map.

]

The community farming collective is a recent, grassroots movement to reclaim traditional ecological knowledge in Hanen. They reject large-scale farming and cultivate only native species. Hanen is far from the empire it once was, and the slow transition from concrete to dirt under your wheels seems to reflect an awareness of this.

You admire the gentle touch of humanity that keeps the forests ripe for mushroom hunting and the fields ready for wild rice. Somewhere in the collective is a seed bank.

(if: $majaatl is true)[<p style=“color:#b5f280;”>[Orator]</p> You watch the farmers use tools you’ve never seen. Your experience with Haneni agriculture leaves a sour taste in your mouth; but here, in the collective, they appear to be far more aware of their own bodily movements and farming practices define the landscape. And in turn, how the landscape defines their farming. (unless: $lines contains (“farm”))[(set: $lines to $lines + (a:”farm”))](unless: $log contains (“Old Lines”))[Old Lines has been added to your memory log(set: $log to $log + (a:”Old Lines”))](else-if: $lines’s length is 12)[Your memory log for Old Lines is complete.](else:)[You have learned more about Old Lines.]

You choose to follow this line to one of the farmers, who offers you a fruit never profitable enough for Hanen to cultivate in Majaatl. You do not enjoy speaking Haneni, but you use it to thank the farmer and chat a bit about the kinder parts of cultural diffusion between Majaatl and Hanen. They seem keen on your admittedly weak knowledge of crops. You agree to swap recipes one day.

(unless: $log contains (“Tasting Trails”))[Tasting Trails has been added to your memory log.(set: $log to $log + (a:”Tasting Trails”))]]

(if: $andazi is true)[<p style=“color:#f0c384;”>[Poet]</p>

(unless: $log contains (“Taxidermy Cows”))[You stop at a curious statue in one of the farmer’s yards. It is a creature you have seen only in history books and archival databases: the humble cow, and the animal both your and Hanen’s people once used as the backbone of their diet. The cow’s glass eyes reveal nothing. You cannot help yourself, and reach out to touch the hide.

“Fake,” the cow’s owner says. “Made of vegan leather. The plastic kind. My grandma made it a long time ago.”

The unnatural resilience of the statue suddenly becomes clear. You wonder if the cow is accurately depicted. You do not know enough about what they were to tell.

“Honestly, you can have it if you want. I only keep it here to scare away the neighbors. That’s a joke, by the way.”

It does not sound like a joke. You too, are unnerved by the cow, but you thank the stoic farmer anyways. (set: $log to $log + (a:”Taxidermy Cows”))Taxidermy Cows has been added to your memory log.](else:)[You breathe in the fresh air, wondering if you can convince the In-Between to set up a farming section.]](else-if: $hanen is true)[<p style=“color:#f28080;”>[Keeper]</p> You meant to join this place before you chose to work in the In-Between instead. It is the only place far enough from the smog. You make small talk with the farmers, and then it is time to leave.]

Àndāzī

Figure 30: Àndāzī (NEOM, 2023)

The paths become dust under the tread of your tires. An arid wind sweeps your skin, and the sky dims through a cloud of sand. The cool waters of the river and coast keep the desert from swallowing all thoughts of human survivability.

The roads in Àndāzī were built by oil. When the oil disappeared, so did the power the ruling class had built itself upon. Some say it's better this way; Andazi is now as it once was, free from the reigns of such a substance. (if: $andazi is true)[[Poet] But you know better. The people are still

recovering from the disruptive economic and social shifts the discovery of oil caused. The groundwater reservoirs are still empty from watering oil barons' lawns. The traditional manifestations of memory have an oil-shaped scar in their heart.](else-if: $hanen is true)[[Keeper] Your friend The Pilot argues the reigns of the economy have been handed to tourists instead.]

Visit the [[national park->A Park for Hoodoos]].

Head towards the [[beach->The Swallowed Beach]].

Follow the fresh water to the [[Town of Festivals]].

A Park for Hoodoos

Figure 31: Hoodoos (Kumar, 2017)

The hoodoos sit in the desert like apartment buildings. Sparse vegetation grows at their bases, and if you look carefully enough, you can imagine how crepuscular creatures hide within them. It is a city block with its own night life.

The park was created by the Andazi government in spite of the fact that few people saw a desert, of all places, as worth preserving. Your bike struggles over the cracked ground.

(if: $hanen is true)[<p style=“color:#f28080;”>[Keeper] </p> (if: $oil is true)[You empty the oil out in the shade of a hoodoo. Only the glass vial remains. You keep it as a reminder of the insidious substance that tried to destroy this place. Your memory log for One Last Drop of Oil is complete.(set: $vial to true)](else:)[This place was filled with oil, once.]]

(if: $majaatl is true)[<p style=“color:#b5f280;”>[Orator]</p> Common belief—or perhaps the romanticized story sold to tourists—is that the ancestors of the Andazi people followed the hoodoos to find every hidden oasis in the desert. (unless: $lines contains (“park”))[(set: $lines to $lines + (a:”park”))](unless: $log contains (“Old Lines”))[Old Lines has been added to your memory log(set: $log to $log + (a:”Old Lines”))](else-if: $lines’s length is 12)[Your memory log for Old Lines is complete.](else:)[You have learned more about Old Lines.]]

(if: $andazi is true)[<p style="color:#f0c384;">[Poet]</p>

Beyond the hoodoos, where the monumental shadows die out and only sand is left, is a small art collective that runs on solar power. Your friend worked there briefly, and you'd like to visit [[their project->EmptyGallery]].]

Figure 32: Darkness database (Paterson, 2010)

This image was removed because of copyright restrictions. It depicted Katie Paterson's History of Darkness Project. Original source: Paterson, K. (2010). History of Darkness – Series of Slides. *Katie Paterson,* https://katiepaterson.org/artwork/history-of-darkness/.

</i>if: (count: (history:), "A Park for Hoodoos") is >=1)[You bike past the hoodoos, bidding farewell to the shade of their spires as you follow the signs to the Empty Gallery. The hoodoos are gradually replaced by solar panels running miles long, the desertscape shifting from vertical to horizontal landmarks.

You approach the gallery's entrance. It is a nondescript building carved from stone. The cooling systems are assisted by the natural properties of the rock, and you gratefully wipe the sweat off your brow as you step inside. Your friend, The Artist, designed it from the old architecture that used to pepper Andazi's river.

Most of the displays, as the name suggests, are empty. They were either moved to the Museum of Progress in Ravaaga when The Artist moved there, or they have always meant to be empty. You ponder the empty frames, the inverted shelves, and the speakers playing a feedback loop of nothing. It is sadly reminiscent of the In-Between's current state.

On the walls you see a handful of suns drawn in red ochre paint. They are reminiscient of the cave paintings hidden deep within the desert, away from prying tourist eyes, but the color of these suns are far more steeped in blood.

Figure 33: Red sun painting (Cueva de los Manos, Rio Pinturas) (World History Commons, 2005)

(unless: $sun contains (“wall”))[(set: $sun to $sun + (a:”wall”))](unless: $log contains (“Anthologies of the Red Sun”))[Anthologies of the Red Sun has been added to your memory log.(set: $log to $log + (a:”Anthologies of the Red Sun”))](else-if: $sun’s length is 4)[Your memory log for Anthologies of the Red Sun is complete.](else:)[You add another sun to your anthology.]

The Artist’s display is an old computer. The screen flickers as you step closer. As you place your hands on the keyboard, it [[prompts you->databaseStart]].](else:)[You admire the ambience of the emptiness, and then get back to work.]

Enter the name of a bird species:”, “”))[<h3>Search Results</h3>

The species “$bird” no longer exists.]

(set: $mammal to (prompt: “Enter the name of a mammal species:”, “”))[The species “$mammal” no longer exists.]

(set: $fish to (prompt: “Enter the name of a fish species:”, “”))[The species “$fish” no longer exists.]

(set: $plant to (prompt: “Enter the name of a plant species:”, “”))[The species “$plant” no longer exists.]

(set: $riverdb to (prompt: “Enter the name of a famous river:”, “”))[The “$riverdb” no longer exists.]

(set: $landmarkdb to (prompt: “Enter the name of a famous landmark:”, “”))[“$landmarkdb” no longer exists.]

(set: $city to (prompt: “Enter the name of a city:”, “”))[“$city” no longer exists.]

(set: $human to (prompt: “Enter the name of your favorite human:”, “”))[“$human” no longer (link-reveal:”exists.”)[

The Swallowed Beach

Figure 34: Plastic beaches (Funk, 2021)

The ocean creeps into the mud. There used to be sand here, where people would lay and admire the unobstructed view of blue all the way to the horizon. When the waters started rising, they missed the trees that once obstructed that view. Now the tide brings in plastic from all over the world, a colorful and multicultural variety of trash. Glittering microplastics create new sand. Bottle caps create new shells.

(if: $majaatl is true)[<p style=“color:#b5f280;”>[Orator]</p> Majaatl and Andazi were thought to have the same ancestors—a group of seafaring navigators who used the stars to travel the many islands dotted along the coast. Nowadays, they would find islands of trash, too. (unless: $lines contains (“beach”))[(set: $lines to $lines + (a:”beach”))](unless: $log contains (“Old Lines”))[Old Lines has been added to your memory log(set: $log to $log + (a:”Old Lines”))](else-if: $lines’s length is 12)[Your memory log for Old Lines is complete.](else:)[You have learned more about Old Lines.]]

(if: $hanen is true)[(unless: $log contains (“Plastic Iconography”))[<p style=“color:#f28080;”>[Keeper]</p> You sift through the polymer grains. An icon of the Haneni religion catches your eye. It, too, is made of plastic, the sacred symmetry somewhat worn by the ocean journey. In Haneni belief, the material world is nothing to compared to your immortal soul. And yet, as you toy with this token between your fingers, you wonder if the material world is so mortal after all. It would take quite the dedicated iconoclast to destroy Hanen’s mass-produced spirituality.

You pocket the icon. As you do, you spy a simple wooden boat. You [[follow the trail to the heart of your religion->Island of Trash]].]]

Figure 35: Plastic oceans (The Ocean Cleanup, 2019)

This photo was removed because of copyright restrictions. It depicted the Great Pacific Ocean Garbage Patch. Original source: The Ocean Cleanup. (2019). Image of the Great Pacific Ocean Garbage Patch. In *Forbes*, https://www.forbes.com/sites/scottsnowden/2019/05/30/300-mile-swim-through-the-great-pacific-garbage-patch-will-collect-data-on-plastic-pollution/?sh=37a6e80d489f. Accessed February 20, 2024.

You commandeer the boat and, almost as if possessed, let the currents guide you to the origin of the icon in your pocket. It takes a moment to come into view, but there it is: your own immortal soul, divinely embedded in plastic.

The island of waste that you see on the horizon swirls more gently than you'd expect. There is a monument for every soul on Earth and then some: the empty oil canister, the branded shopping bag, the modest candy wrapper. And, at the foundation of it all, millions of copies of the icon in your pocket, one for every soul asking for absolution.

You could not possibly collect it all.

Town of Festivals

Figure 36: Street markets (Spratt, 2018)

Dòmbízhí is better known by its nickname, the Town of Festivals, for its year-round celebrations stemming from a diverse set of traditions. The town's proximity to beach and desert alike means half of the real estate is taken up by modern hotels and rich expats. The residents responsible for its popular festivals have been pushed out to the cheaper districts, where the dust sickness is worse and the streets are never cleaned.

(if: $majaatl is true)[<p style=“color:#b5f280;”>[Orator]</p>
Dòmbízhí is built on the only river in Andazi. For thousands of years, long before the town was built, this river served as meeting place, sacred space, and reservoir. (unless: $lines contains (“town”))[(set: $lines to $lines + (a:”town”))](unless: $log contains (“Old Lines”))[Old Lines has been added to your memory log(set: $log to $log + (a:”Old Lines”))](else-if: $lines’s length is 12)[Your memory log for Old Lines is complete.](else:)[You have learned more about Old Lines.]

You decide to visit the market and engage in the age-old tradition of [[clothes shopping->Weave]].]

(if: $hanen is true)[<p style=“color:#f28080;”>[Keeper]</p>
(if:(visited: “Aerial”))[You head into the older districts to spend a quiet moment with The Pilot. It’s good to visit friends.](else:)[(unless: $pilot is true)[(set: $pilot to true)]Your friend The Pilot lives here. He has made the most of tourists (and their wallets), understanding that he must keep up the façade of a charming but simple local in order to maintain his family home. You make your way to said home, knowing he, of all people, understands waste in The Aftermath.

He greets you at his doorway with a smile bright as the midday sun. (if:(visited: “Extraction Sites”))[You ask him if he’s interested in the Ravaagan mines. It’s fortuitous timing; he himself was about to contact you about the same thing. He’ll meet you there.](else:)[He was hoping

you'd stop by, as it turns out. He has recently joined a photographer's collective interested in aerial photography. The two of you used to do the same; him in the cockpit, you with the camera. He wants to do a project on the mines in Ravaaga, and will meet you there if you're interested.

The market is filled with colorful fabrics and geometric patterns that remind you of your mother's weaving, which you have wrapped around your waist.

You have a tempestous relationship with tourists, even when you are one; when you look at the weaving on display, you know that you do not understand the tacit knowledge the fabric holds. The meanings of yellow, red, and blue are lost to you, for you know they do not represent the same landscape as the yellow, red, and blue on your skirt.

A woman beckons you over. Her clothes are made from cheap synthetic fibres and the colors appeal to the more exoticized depictions of the Andazi culture. You know, from your own experience selling weaving, that these are not clothes for insiders. And yet, they tell a cultural story all the same. The patterns are not the same, and nor are the representations of nature within them, but the woman still has a traditional loom resting among her tools.

You haggle a blanket down to a decent price.

Other

The world we know is passing on. Some call it The Aftermath, for it is a world facing the consequences of industry, exploitation, and want; in other words, it is the aftermath of [[The Anthropocene->Anthropocene]].

We currently reside in the In-Between at the center of all things. Once, people would come here to place their memories, filling shelves and nooks, waterways and whispers, with the knowledge most precious to them. It was the place of [[cultural memories->Cultural Memory]], and it told stories.

Not everyone wishes to remember those stories. Not everyone agrees with how the story is told. Regardless, the In-Between was somewhere for cultural memory to be remembered, discussed, and challenged.

The In-Between was emptied out in The Aftermath. But, there are still things out there worth remembering. Perhaps there are things worth forgetting, too.

Who are we, [[to collect->Collecting]] the memories of the Anthropocene that remain?

[[Pick a worker of the In-Between->Origin]]

The barren shelves and paths of the In-Between loom over you. They were built to hold a great many things—a story, a song, a sapling. You remember a festival performed on one of the rivers. A communal pot of stew steaming on a display stand.

The old Director retired in The Aftermath. Nothing worth remembering, they said, after industry polluted the sky and the ocean overtook the land. But the residents of The Aftermath have built their own memories that ask: what is the cultural narrative memory of the Anthropocene? What benefits, what suffers, what changes—from our domination, our industry, our beliefs?

It is time to figure out your narrative memory of the Anthropocene. You own a [[map]], a [[memory log]], and a number of recording devices to help you collect memories for the In-Between. You latch your bag to your bike. You are ready.

You have opened your trusty map. Places will be added to the map as you explore. You may travel at any time to these discovered places by opening the map again.

You are from Hanen, which flowered along the temperate river deltas and valleys of the continent. The rich economy of the nation was built on conquest and class divide.

Having seen the colonial and sociopolitical factors that drive the Anthropocene—alias the Chthulucene—you are well-equipped to understand how industry and cultural memory intertwine. You are determined to collect the Uncollected Waste your culture has tried to forget.

You are from Majaatl, a humid nation to the south whose jungles and rivers are plentiful in biodiversity. The scars of war and extraction stain your homeland, but your traditions live on in the post-occupation present.

You are interested in forms of collecting that dissolve the artificial boundaries between humanity and ecology, wishing to examine Ecological Memory as a form of resilience in the narrative of cultural memory.

You are from Àndāzī, a dry and arid place off the southwest coast. Settlements are clustered around the few sources of freshwater and fishing. Living in a place so susceptible to changes in climate has made you keenly aware of mourning the way the environment used to be.

You understand how trauma manifests in cultural memory, but you also understand resilience and the importance of thinking Ecopoetically about trauma related to the Anthropocene.

You are from Ravaaga, a cold and sparsely populated nation sitting on the north of the continent. Once, they were a leader in innovation, but their limited resources ran out before their ambition did.

As such, you are well-acquainted with the folly of taking an anthropocentric approach the longevity of human memory. You wish to understand cultural memory in the context of Deep Time, where prehuman and posthuman considerations inform your collection.

Ending Sequences

We examine the current state of the In-Between.

<p style=“color:#f28080;”>[Keeper]</p> The server farm occupies its own section. It is an admittedly large portion of the space compared to its equally obsolete cousin, the vial that held the drop of oil. The rest of your collection is taken up by the to-scale photos of scars now lining the walls. You juxtapose the automata from the factory, which has followed you here, against these back drops. You hand it the plastic icon, which appears to have been one of its creations.

<p style=“color:#f0c384;”>[Poet]</p> You remark that the machine is not necessarily a wasteful thing. The machine is only waste because its products and its labour were forgotten. You have now highlighted its capabilities—what could it create now?

<p style=“color:#b5f280;”>[Orator]</p> You look at these waste products of technological prowess. You tell the Keeper they have done an excellent job of bringing forgotten scars and industrial labour to the forefront, but that perhaps in their pursuit of waste they have forgotten to untie industry from futility. You remind them that innovation can be tied to caring for the collective lives of the ecosystem, too.

<p style=“color:#78e1eb;”>[Futurist]</p> You agree that the display is missing something. Maybe, to highlight the decreasing carbon emissions that shows we have acknowledged our waste, you could juxtapose the server farm and oil drop against a more... future-friendly product of innovation, where it is not the waste that will be left over thousands of years from now, but the sustainable practices put into it.

<p style=“color:#f28080;”>[Keeper]</p> You agree with your colleagues and think on the sustainable innovations that persist even in The Aftermath. Waste is, after all, only waste when it is forgotten. Perhaps by bringing it to the forefront, there is a memory of ingenuity [[that could be built here->EndingK]].

We work together to build it, and the automata helps us. There it is; a tiny model eco-city, complete with solar-powered lights and real plants that will grow over the urban sprawl. It is a representation of the cooling jars on Andazi windows and stilted houses in Majaatl. It is the vertical farms being built in Hanen’s capital and the geothermal energy grid in Ravaaga. We study the [[Industrial Insights]] the acknowledgement of waste has produced and are satisfied with our work.

[[We move on to the next collection -> EndingSequence2isFuturist]].</tw-passagedata><tw-passagedata pid="92" name=" EndingSequence2isFuturist" tags="nolog nomap" position="325,350" size="100,100">The miniature model makes the photos of scars a little less imposing. The automata seems to like it too. The Futurist chooses to go next.

<p style=“color:#78e1eb;”>[Futurist]</p> You place the bead and the space debris next to each other. A floral scent wafts through the air as you decide the <B>silurian sample should be kept in the ruins, which you feel is a fitting combination of two remnants; one deep in the earth, one structured atop it.

<p style=“color:#b5f280;”>[Orator]</p> You breathe in the scent of the extinct flower. It reminds you of walking through the flower conservations in Majaatl. You tell the others it would be nice to keep more flowers here.

<p style=“color:#f0c384;”>[Poet]</p> You suggest a less traumatic representation of nature than the cow you have carried home. Living things tend to be more popular with visitors.

<p style=“color:#f28080;”>[Keeper]</p> Indeed, they are. But you also bring up the question of things yet to live—do they have a place in deep time?

<p style=“color:#78e1eb;”>[Futurist]</p> You think of the things yet to be and their potential as memory objects. There is, in fact, a phenomenon that has existed before and will exist after humanity, and yet has [[defined it all the same->EndingF]].

We spend some time speaking with the farmers, but eventually we acquire it: the community seed bank, which holds plant embryos of species that no longer exist in The Aftermath. Many of the seeds are for food, but it appears the humble flowers and ferns of the world have been preserved too. We place the [[Presence of Seeds]] among the grassy ruins of the In-Between and leave the rest in the vault. Two places for storage; one frozen in time, and one that will propagate endless futures.

It is [[time to move on->EndingSequence3isOrator]].

You display your collection in a circle. The circumference is the old lines you have travelled upon to acquire the rest of your items. The river cuts neatly through the middle, running from the collective memories held at the peak of the mountain. In between, you weave the trails of textiles and the taste of culture.

<p style=“color:#f0c384;”>[Poet]</p> You say the display is equal parts visual and literal feast. But what about the other senses you discovered while walking on the old lines? Is there no room for them?

<p style=“color:#78e1eb;”>[Futurist]</p> You suggest that there could be a quite literal voice of nature; one more capable of being recorded for posterity and dissemination in memory.

<p style=“color:#f28080;”>[Keeper]</p> You agree; somewhere between the voices hiding in the mountain archive and the river tellings, there is a larger sonic force that could be used to transform memory practices.

<p style=“color:#b5f280;”>[Orator]</p> You know very well of what they speak, and believe you will find a sound that perfectly dissolves the artificial

dichotomy of human-nature by [[inviting them to walk the old lines->EndingO]].</tw-passagedata><tw-passagedata pid="97" name="EndingO" tags="nolog nomap" position="200,350" size="100,100”

This page originally played a mix of constructed noises. Two noises, a NASA black hole recording and a plant sound experiment, were removed because of copyright restrictions. You can find the original recordings on YouTube:

TomuTomu. (2015). Plant Sounds. YouTube, https://www.youtube.com/watch?v=VvWPT4VhKTk.

NASA’s Marshall Space Flight Center. (2022). Data Sonification: Black Hole at the Center of the Perseus Galaxy Cluster (X-ray). YouTube, https://www.youtube.com/watch?v=ioR5np1fmEc.

]}We circle around the places we have seen, and this time, through the mediation of walking, we listen. Along the way, The Artist offers us their recording equipment. We record, and walk, and listen. When we have completed the circuit, we listen to the recording again and hear the recorder’s rendition of [[Constructed Eco(Tones)]]. We admire the hidden things we didn’t hear before: the lichen growing on Hanen’s streets; the tinkling of wind-blown sand in Andazi; the march of ants in Majaatl; the first snowflakes landing in Ravaaga.

Another collection is complete, so it is [[time to move on->EndingSequence4isPoet]].

The Poet is the last to go. It feels fitting that the In-Between's collection will be finished with the modern relics of resistance The Aftermath's inhabitants have created. We examine the art pieces together.

<p style="color:#f0c384;">[Poet]</p> You are the kind of person who feels first, so you place the dance on display first. You then add the objects of death last: the child's drawing that was a relic of illness, the taxidermy cow, and the empty database. For a more uplifting ending, you place the various depictions of the red sun last to remind everyone that death can be faced together.

<p style="color:#b5f280;">[Orator]</p> You find it a morbid display, but as you watch the dance, you feel that it is okay if certain things disappear so long as it leaves room for loss and a kinder place.

<p style="color:#f28080;">[Keeper]</p> Your first thought is that the collection is quite hopeful. Your second thought is that the loss within it is nearly overwhelming, but as you think on it, you like your first thought better.

<p style=“color:#78e1eb;”>[Futurist]</p> You suggest to the rest that there is nothing wrong with death so long as memory remains and the world cycles on. Loss creates its own form of resilience.

<p style=“color:#f0c384;”>[Poet]</p> The words of your colleagues strike true. Humanity may continue, or not, and is it so terrible if our memory objects decay alongside us? There is room for [[forgetting and resilience alike in your display->EndingP]].

We examine each item more carefully. On one of the anthologies, The Futurist points out a mold colony. It appears this particular copy of the anthology has already started to decay. The Poet thinks it just leaves room for another anthology to be made. We agree, and accept it as [[Death of the Art Piece]]. There will always be room in the In-Between for loss.

Having finished curating our collections, we step back to [[admire the whole->FINAL]].

The collections intertwine together rather quickly. The In-Between is unlike other memory institutions; it prefers keeping its memory schema vast and unknowable, forcing only the bravest individuals to disseminate its labyrinthine paradigms.

In time, you open the In-Between to visitors. The Artist and The Pilot are delighted to see their works on display. The Curator, who has finally had to close the Museum of Progress, spends her retirement catching up with all of you. Even The Director visits and begrudgingly admits you did well.

The Traveller spends the most time here. You wonder if stewardship will pass to them one day, or if the In-Between will cease to exist between then and now, future and present.

For now, the In-Between stands as it always did, in the center of all things. Past, present, future. Industry, waste, repurpose. Life, growth, decay. Whether or not the Anthropocene can be captured in such a place remains to be seen, but you hold onto the memories anyway, knowing that someday, they will shape the future to come.

<p style=“text-align:center; font-size:300%;”>The End</p>

Conclusion

Herein marks the end of the thesis, and the end of the game’s text.

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Appendix A: Audio Materials

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Appendix B: Images and Video

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