A SUBLUNARY: FROM THE ANTHROPOCENE TO THE AEROCENE

CARLA SCEMAMA
MASTER OF ARCHITECTURE, 2019
TULANE UNIVERSITY
ADVISOR: AMMAR EL OUEINI
AERO
prefix

Word Origin for aero- ultimately from Greek αέρ air. Word Origin and History for aero- word-forming element meaning “air, atmosphere; aircraft; gasses,” from Greek aero-, comb. form of aer (genitive aeros) “air, lower atmosphere”

-CENE
suffix

Word-forming element in geology, introduced by Sir Charles Lyell (1797-1875), from Greek καινος “new,” cognate with Latin recens. Cene is a Variant of ceno-1 as final element of a compound word: Pleistocene.

AEROCENE
coined by Thomas Sorcaseno

Aerocene is an interdisciplinary artistic endeavor that seeks to devise new modes of sensitivity, reactivating a common imaginary towards achieving an ethical collaboration with the atmosphere and the environment. Its activities manifest in the testing and dissemination of lighter-than-air sculptures that become buoyant only by the heat of the Sun and infrared radiation from the surface of Earth.
TABLE OF CONTENTS:

OVERVIEW
Thesis Statement
Abstract

PREMISE
Narrative
Humans and Climate Change
Climate Change Projections
Anthropocene
Advancements
Post-Anthropocene

PRECEDEMENTS
HAVOC
Mountain Lion Park
Hydrogenase
Solar Impulse
Ring Bell
Solar Bell
Stillness In Motion
Cloud City

NARRATIVE
Program
Program: City
Program: Individual
Aerosolar Journeys

SITE
Site
Site: New World Map
Aerocene
Analema Tower

REPRESENTATION
Amazonian Pier
Final Drawings
Mass customization
Aerocene Drawings
OVERVIEW
THESIS STATEMENT AND ABSTRACT

THESIS STATEMENT

A sublunary in which self-sufficient humans migrate to man-made ecosystems in the sky in the hopes to let Earth recuperate from all the damage caused during the Anthropocene Epoch. Ultimately, this exodus will mark the end of a long era characterized by abuse and dominion upon the Earth and its resources. Homo Sapiens now welcome you to the Aerocene.

Image produced by author, "Conceptual Illustration of Aerocene"
ABSTRACT

The deadliest predator on Earth is our very own kind.

Beginning 70,000 years ago, Homo Sapiens underwent a cognitive revolution. Most scientists attribute our unparalleled achievements to this biological shift, which drove our conquests and creativity. Since then, humans have continuously climbed and evolved at a rate faster than evolution itself.

Objectively, modern Homo Sapiens have been altering the face of this earth since their very existence. However, particular attention should be given to the last few decades, as they include the most dramatic changes and damages in physical, biological, and chemical facets of ecosystems, oceans, and global climate. This human dominion and the astronomical changes sparked by this ecological abuse caused such drastic global changes, that a new geological time period evolved as The Anthropocene.

Future climate change projections reveal a sordid fate for this planet. Ranging from sweltering temperatures to fatally toxic air. These global climate changes are not reversible and will exponentially get more violent. However, a silver lining has surfaced with the blooming technological and biological revolution lying close in the future, similar in impact to the cognitive revolution 70,000 years ago. Revolutionary advancements such as genetic modifying, cyborg engineering, and alternative fueling will not only attenuate some of our pressing global issues, but also completely remodel the way we live.

Bridging this notion of pending climate change ramifications with these revolutionary advancements in technology and biology, humans have the possibility of becoming self-sufficient and independent of Earth’s resources for survival. We will be able to grow our own meat, make our own fuel with alternate environmentally friendly energy, and create our very own urban ecosystems. In the wake of this change, I hypothesize that humans will make a global migration to floating ecosystems residing in the cleaner air this Earth has to offer, seeking their closest refuge from calamitous natural disasters. Escaping the overwhelming carbon dioxide and methane emissions, among other crises, will allow us to let this planet recuperate from the damage caused during the Anthropocene. In doing so, humans will completely alter the way they live, culminating in the mark of a new era that juxtaposes the Anthropocene Epoch by celebrating and respecting nature instead. From this, a new and improved geological time period is born.
As a child, I lived in the typical suburban home. Karen would tie the rope to two sticks and I would dip the rope in the bucket of watered down soap. We would each grab one stick, and in unison, run down our block, letting the bubbles trace our path. I have fond memories of this time, it was my home, and it was always in the same place.

I don’t hate my nomadic lifestyle. I just nostalgically think back to my childhood sedentary years. I sit at the Bottom Community Park and look up to see what reminded me of my childhood memories where different sizes of bubbles swarmed my vision. Although I was engulfed in nostalgia, I couldn’t seem to remove the adult lenses I had learned to wear for the last sixty years.

It was indisputable that the poor hovered over the bottom, nearby the water that embodies the remnants of the vintage world. The wealthy float well above us, in the clouds, where the air is cleaner and more pure.
Some problems will never be solved in this society. There will always be the poor and the wealthy. The existence of the ones that fall in between those two categories come and go. Which is why my home, my bubble, is closest to the ocean. I like it there, it reminds me of the damage we have done and the resilience my lovely planet has shown.

We have managed to plagiarize The earth's work by making our own hills, trees, parks, playgrounds, farms, and foods. Now more than ever, I understand why they say that “Imitation is the sincerest form of flattery that mediocrity can pay to greatness.”

I think about the lack of attention that has been attributed to the evolution of human happiness. On this very bench of the bottom community park, I often find myself pondering about many questions I do not have the answer to. Are we happier than the typical inhabitant of an Etruscan Mud hut?

Objectively, we are still physiologically built the same, so we probably are not happier than the Etruscans just because we have access to social media and, occasionally, a college education. We do, however, hold a few valid accomplishments as a wide population. Realistically, we might not be happier but we would not be alive without the Symbiocene transition. Overall, humans maintain a better quality of life.

One thing has definitely changed for the better. The people that inhabit our new ecosystems respect the Earth some of us fought so hard to heal and protect. The ones that do not agree with this line of thought, have to at least agree with this new system because it keeps them alive, fed and safe. In that aspect, I feel humans are directly benefiting from this and are happier. Eventually we will get used to this, future generations be generally detached from original nature. Living above the clouds will become the norm of comfort and stability. Headlines on the news will announce NASA’s project back to Earth, this time absolutely forbidding any sort of harm to our planet. As they will be treated like artifacts in museums and old paintings in galleries, and revered like Pandas in Japan.

I prefer to watch it from a distance, if it ensures her safety. At Last, The Earth has become a respected artifact and I deeply fear our species' return.
01/02 MELTING ICECAPS
In NASA's "understanding sea level empirical projections," explains the predictions and repercussions of the rising sea levels and flooding caused by the melting of ice caps. This process not only impacts arctic wildlife but also promotes the global expansions of water bodies that absorb more CO2 and endanger water-based species. Furthermore, NASA's projections hypothesize that rising sea levels could displace 50 million inhabitants by year 2100.

03/04 HURRICANES AND NATURAL DISASTERS
Climate change has been directly linked with natural disasters such as hurricanes, earthquakes and more. The illustrations above display the destruction caused Hurricane Harvey (2017), whose damages have been estimated at $42 billion, making Harvey one of the top 5 costly hurricanes. These economic costs are roughly the same as Ike (2008), which struck Texas at $43 billion, and Wilma (2005), which struck North America at $38 billion.
Some argue that the deadliest predator is armed with two inch claws, a gargantuan 10 foot height and a monumental weight of a thousand pounds. These mighty nomads, labeled as the largest land carnivores, are known as the Arctic Icecap Polar Bears (Oakley 1). A few others claim that the saltwater crocodile (Crocodylus porosus), the largest living reptile growing to 23 feet and 2,600 pounds, is the most aggressive hunter (Barrett 9).

However, I argue that the deadliest predators on this earth, are irrevocably not the ones with the sharpest teeth and the fastest pace. The most dangerous killers on this planet are equipped with bipedalism, opposable thumbs and a generally unimpressive height of five and a half feet. These physical characteristics are rather non-threatening, at least compared to Polar Bears and crocodiles. Be that as it may, modern humans have one lethal weapon that has allowed our species to “outrun” tigers, domesticate animals, hunt mammoths, and even eradicate Neanderthals. Homo Sapiens are responsible for countless millions of deaths, leapfrogging from one bloodbath to another, from The Cambodian Genocide to World War One & Two. As a whole entity, we have effectively created a global empire and conquered the world through our unique language and exclusive cognitive abilities (Harari 19).

Beginning 70,000 years ago, Homo Sapiens underwent a cognitive revolution which allowed us to teach eachother expansive languages, stories and even religious beliefs. Most scientists attribute these unparalleled achievements to this cognitive revolution, which drove our conquest and creativity. Since then, humans have continuously climbed and evolved at a rate faster than evolution itself. The magnitude of negative human interplay on the Earth has been rapidly increasing with an alarming crescendo.

Objectively, humans have been altering the face of this earth since their very existence. However, particular attention should be given to the last few decades, as they include the most dramatic changes and damages in physical, biological, and chemical facets of ecosystems, oceans, and global climate. These human-induced alterations have been tied to global changes to such extent, that a new geological era was conceived, marking the monumental success of the deadliest predators depleting the planet, The Anthropocene.
01/02 MELTING ICECAPS

Originally designed as an impenetrable deep-freeze vault serving as a global foodbank, Norway’s Svalbard seed vault nicknamed “Doomsday”, was flooded due to the extreme permafrost melts caused by unusually warm temperatures in May of 2017. Ultimately, a global foodbank made in case of a drastic climate change was destroyed by climate change, specifically melting ice caps.
David Wallace Wells’ “When Will the Planet Be Too Hot for Humans? Much, Much Sooner Than You Imagine”, provides a lengthy and disturbingly sordid excerpt focused on future climate change projections and the repercussions that come with them. The author breaks up the article into 9 major problems, each with varying subcategories of issues and consequences. His introduction alone, sets a grim scene for the article in which he explains the vastness of the problems that lie before us, boldly declaring that we tend to abstract the monstrosity of these issues. The first, labeled as “Doomsday”, explains that the Arctic permafrost holds around 1.8 trillion tons of carbon, a sum that amounts to be at least double the amount resting in the Earth’s atmosphere. It is unfortunately educatedly assumed that this permafrost will thaw and be released into the air, which then poses a more complex problem. Potentially, the carbon would instead be evaporated as methane, a property that is 34 times more detrimental as a greenhouse gas than carbon dioxide. In which case, the Earth’s atmosphere would retain the sum of the melted permafrost, on top of the carbon dioxide surplus currently in the atmosphere, making the air intensely toxic. Furthermore, Wallace expresses in problem number 4 of arctic ice melts, where many diseases that have been trapped in the glaciers, some of which surfaced prior to the existence of humans, would be reactivated. This would mean that humans have not been exposed to the disease and therefore do not have the immune system built for it. In a sordidly better scenario, diseases that we have been exposed to before would be released. Last May, BBC released a report led by scientists that expressed wariness regarding Smallpox and The Bubonic Plague being trapped in Siberian Ice. Seemingly, the rising sea level and potential destruction of Beach Houses on the waterfront is a marginal problem in comparison to the Bubonic Plague’s potential bold comeback.
Image produced by author, Global Air Temperature Anomalies Timeline (1850-2010), Data obtained from European Environment Agency
CONCLUSION: FUTURE CLIMATE CHANGE PROJECTIONS

The most important takeaway from this text is the claim that David Wallace Wells has found many creden­
tialed and tenured scientists in the field along with advisors of the IPCC, that have agreed with his “apoca­
lyptic conclusion: no plausible program of emissions reductions alone can prevent climate disaster.” There
is a zero percent chance of reversing climate change, even if all humans resorted to being ecological saints
within the next ten years. To put things in perspective, the five hottest summers in Europe since the year
1500 have all taken place between 2002 and now. Even if we were to able meet the optimistic Paris Plan
goals of a maximum of two degrees warming, cities like Karachi and Kolkata would be bombarded with
heat waves and barely qualify to be habitable. An increase of four degrees would place us on the same
level as the 2003 European heat waves, which killed two thousand people a day. A six degree increase
would render any form of summer labor and growth absolutely impossible. Lastly, an eleven to twelve
degree increase, would result in more than half of the world population’s death from direct heat, setting
aside further likely complications of food and water supply.
06/07 NUCLEAR BOMB
Pictures of the first atomic bomb being set off in 1945, marking the beginning of the Anthropocene Era.
The Anthropocene

As a general organizing principle in science, geological epochs exist to categorize periods of time that demonstrate evidence of an occurrence of a significant geological event. For example, the Pleistocene Ice Age, marks the extinction of many large-scale mammals and birds, as well as a substantial climate cooling (Wilmarth 5). This temporal system is referred to as the geological time scale. Therefore, in order to justify the Anthropocene as a separate era, drastic global changes were manifested to such an extent, that it can be irrefutably distinguished as different geological time period.

The concept of “Anthropocene” was developed by Nobel Prize Winner Paul Crutzen, at a conference in the year 2000 (Bradshaw). He made the observation that it no longer seemed correct to simply label us in the Holocene era, given the development of humans and their increasing control over the planet. The word is very appropriately derived from a combination of the root “anthropo”, meaning human with the root “cene”, the standard suffix for epoch in geological time (Bradshaw). Therefore, the word Anthropocene, to put it in short terms, is an era that refers to dominion of humankind and the astronomical changes sparked by this ecological abuse.

Although it is clear that we are well into the Anthropocene era, scientists have yet to agree on its birthing moment. Most scientists have reached a general consensus in which the Anthropocene Era is most logically identified by the commencement of the Industrial Revolution. Another valid proposal introduced the start of the nuclear era in 1945, when the first atomic bomb was set off in the beaches of New Mexico, ultimately triggering an international occupancy of radioactive isotopes (Bradshaw). Regardless of the starting point of this era of man-made destruction, research shows an overwhelming amount of evidence of an exponential growth in carbon dioxide emissions that directly correlate with the increase of global population. Therefore, it has been reasonably deduced that the problems associated with climate change are expected to rise with the human population that is projected to exceed 10 billion inhabitants later this century (United Nations 12).

The most frequently researched and documented ecological changes are greenhouse gas emissions. There is a clear focus on carbon dioxide and methane diffusions, both of which are associated with rising temperatures and sea levels. Be that as it may, many other calamitous global issues could contribute to the extinction of humankind are frequently left out of the spotlight, starting with soil erosions and disturbance of ecosystems that affect overall food growth, paired with a blooming problem of overpopulation and burgeoning diseases left to be exposed by the melted ice caps (Wallace-Wells).
The Vacanti Mouse, created by Charles Vacanti, was implanted with cells in order to generate organs and cartilage. Although the unconventionally grown ear consisted solely of cartilage, this experiment has led many research institutes to experiment with genetic modification and biological engineering to grow complete organs. Hiromitsu Nakauchi, a stem cell biologist at the Stanford University, has successfully grown a mouse pancreas in a Rat, which he then transplanted in a mouse without a functioning pancreas.
Traditionally, social order was austere, stable and continuous. However, the technological revolutions manifested in the last two centuries have been, by contrast, very fast-paced and subject to perpetual change or advancement. People now view social order as a flexible and ephemeral entity, the only genuine common denominator is the assurance of incessant change.

As a broad observation, the world has only continued to make advancements in biology, technology and politics. Whether one sides with these changes or not, the mere occurrence of these radical changes is indisputable. Over the last two centuries, child mortality has dropped from 33 percent or 5 percent, violence and large-scale famines have steeply dropped. (Harrari 378) The money invested in this further investigation of control and power over nature is ever-growing.

Since the industrial revolution, money has been funneled into the economy to produce new products, new medications and treatments. This industrial Revolution should be viewed as a permanent revolution, as it is clear proof of the movement of humanism, a form of religion that worships humankind as god of all other species. We are the dominant beings on this planet and now that Sapiens have this control, they are not prepared to give it up. As the twenty-first century unfolds, Homo Sapiens are surpassing the limits, outrunning evolution and breaking the laws of natural selection. All of these factors are being replaced by intelligent concepts, designed to outsmart evolution. Harrari asserts that the scientific revolution will prove to be far more impactful than the historical revolution, and will realistically be the most important biological revolution since the appearance of life on earth 4 billion years ago (Harrari 399). Moreover, this approaching biological revolution will take place in 3 increasingly self-sufficient stepping stones to being independent of the Earth’s resources. First through biological engineering, then onto cyborg engineering, and lastly, the engineering of inorganic life.
This illustration displays meat that was successfully grown in a petri dish using stem cells from a cow.
Biological engineering is defined as a deliberate human intervention on a biological level, such as implanting a gene in order to modify an organism. For example, a mouse was genetically modified to grow an ear, made of cattle cartilage cells. Cyborg engineering is the next stepping stone to human self-sufficiency, using and creating beings which combine organic and inorganic parts. Devices such as pacemakers and bionic hands are early examples of this. The key to understanding the speed of this biological revolution, is to look at its context. The greeks and Etruscans used peg legs, as any wounded Slovenian soldier in World War One. Yet now, American electrician Jesse Sullivan lost both of his arms in 2001 and was gifted with two bionic arms that operate by thought and transmit physical sensations (Harari).

There are successful methods now for growing vegetarian meat in a petri dish using the stem cells of a cow. Google's co-founder, Sergey Brin, invested in the technology to create a synthetic beef hamburger for in support of animal welfare. This is a new practice currently, but bridging this line of thinking with the pending collapse of farming with climate change explains a logical transition into man-made meat. This suggests a solution to the problem of feeding the growing population in depleting resources and increasingly infertile terrain.

Apart from a clear-cut exponential growth in advancements clearly embedded in history, there is furthering evidence of self-sufficient humans. Humans will be able to grow their own man-made crops and meat (Anderson 42). They will further their studies of alternate natural forms of fuel and be independent of the damaging ones the earth has to offer. Studies of energy retrieved from algae and solar rays will deepen our reliance upon it will be essential once the earth no longer has any to offer.
Image produced by author, "Geological Timeline: Homogenocene, Anthropocene and Aerocene"
PREMISE

POST-ANTHROPOCENE

All of these advancements beg the inquiry of a tremendously important question. What comes after the Anthropocene Era? We are at a point in time where countless scientists acknowledge the pending end of the Anthropocene. In the awakening of ecological change, a new label to this era will be warranted. While scientists do not agree on single answer to the characteristics of the next era, most agree on the fact we are on the brink of starting a brand new one. This thesis challenges to make nature take its rightful throne back. Understanding that the natural disasters and catastrophes we are causing is the result of purely self-destructive behavior is the key to reform. In order to protect the people of this world, we need to defend this planet. If one takes into account the future climate change predictions addressed above, the social change required for this migration will not happen in time for a smooth transition. In the wake of this change, I hypothesize that humans will make a global migration to floating ecosystems in the cleaner air this Earth has to offer, seeking their closest refuge upon calamitous natural disasters. This change would certainly not be out of sheer altruistic notions. But in turn, it would yield the same outcome: allow the Earth to recuperate from all this homemade damage.
HIGH ALTITUDE VENUS OPERATIONAL CONCEPT

Year: 2016
Location: Venus
Authors: NASA

NASA's HAVOC Venus project, Conceptual Renderings by NASA Artist, "Future Cloud City on Venus"
When the Sputnik made history, everyone began predicting that by the end of the century, people would be living in space colonies on Mars and Pluto. It is 2018, Pluto is no longer considered a planet and the colonization of Mars is still wildly abstract. People have incessantly made overstated predictions about innovative trends, but no one foresaw something as essential as the Internet. Any forty-year old individual would make the accurate claim that the world functioned entirely differently prior to the internet’s birth, roughly twenty years ago. Doubtful teenagers would look at this adult, who has outlived currently obsolete trends, with much apprehension. Albeit, the world has a heavy dependence upon the internet now, its is a tool for education and spread of knowledge, a news outlet, and a communication device for social media and emailing. Comparatively, Stephen Hawking made claims about seeking out shelter on alternate planets, Elon Musk is seeking out plans to colonize mars, and NASA started their project for the colonization of Venus’ Upper Atmosphere.

In light of this lapse in judgment, could humans be estimating that we will be living on Mars or Venus, instead of higher up in the Earth’s sky? Lots of attention was caught in efforts to inhabit Mars. Since then, research has found that Venus, who is much closer than Mars, could possibly be a better suited candidate. NASA’s High Altitude Venus Operational Concept (HAVOC) seeks to test the ability for a city hovering the sky of the uppermost atmosphere of the planet Venus. Though the harsh weather conditions at the ground level have an average temperature of 460 degrees Celsius, the upper atmosphere that floats 30 miles above where the conditions are much more manageable, with an atmospheric pressure that more similarly resembles Earth than Mars. NASA’s project schedule aims to get astronauts to Venus by 2035. The overarching HAVOC plan envisions establishing Venus cloud cities in five phases. Phase 1 would involve robotic exploration of the Venustian atmosphere using an unmanned, 102-foot-long (31 meters) airship. In Phase 2, two astronauts would spend 30 days in orbit around Venus. In Phase 3 and Phase 4, two crewmembers would cruise through the skies of Venus in a 423-foot-long (129 m) airship for 30 days and one year, respectively. Permanent settlement would come in Phase 5. At an altitude of about 30 miles, where they’d receive 40 percent more solar energy than Earth receives at its surface. (Arney & Jones, AIAA Space 2017 Conference NASA manual)
Cloud City, featured in Episode 5 of the Star Wars series, is a fictional city in Bespin suspended freely in the clouds and symbolizes political freedom. Conceptually, Cloud City is a mining colony and works by using Tibanna as a source of fuel that symbolizes the location characters escape turmoil from wars in the galaxy. It is said that the design relies on anti gravity pods at the bottom of the structure. This fictional city design has inspired, from an aesthetic standpoint, NASA's High-Altitude Venus Operational Concept.
NASA'S HAVOC PROJECT

Rendering by HAVOC at NASA artist

The team has sketched out plans for and conducted small-scale tests of a blimp-like airship for a crew that would host a two month expedition above the Venusian cloudborne. The High-Altitude Venus Operational Concept (HAVOC) would culminate in the building of what the engineers describe as an aerial colony for "long-term atmospheric habitation and colonization" which directly correlates to this thesis in its merging into the Aerocene Era. Renderings of the HAVOC airship are reminiscent of Lando Calrissian's fantastical Cloud City from the "Star Wars" movies as an aesthetic approach, with precise research on realistic factors and obstacles for a genuine execution. Scientists hypothesize that the first journey will be calm and quiet among an endless field of blue skies.
SUZhou SHISHaN (LION MOUNTaIN) PaRK

Year: 2016
Location: Suzhou, China
Authors: TLS Landscape Arch
Size: 74 Hectars
PRECEDEENTS
SUZHOU SHISHAN PARK

This project spans over 74 hectares and is organized with a unified circulation that is symbolically represented as a circle. The circulation embraces the mountain and the lake, ultimately creating a designed journey or experience. Constructed of 18 poetic moments, scenic bridges connect all of these designed moments. While some spaces, such as the “Overlook”, are created for observing and relaxing purposes, other varying activities ranging from retain to educational museums are paved along the way. This project not only successfully restores an abandoned theme park but also improves upon it with its concept of the full circle circulation. Ultimately, The Lion Mountain Park was redesigned to utilize this desolate land and create a balanced man-made ecosystem within an overly populated city (Wu, Urban Ecosystems).
Site Location

Cicle (Encasing)

Existing Conditions: Mountain and Lake

Circulation: Warp and Nest
SUZHOU SHISHAN PARK

The diagrams on the right illustrate the conceptual approach to the circulation relevant to pre-existing conditions of the lake and the mountain. This cyclic idea holds a cultural symbol of the Ying and Yang and is applied to an ancient, but delapidated piece of land that also holds a sacred place in the heart of its surrounding culture. With the circular shape being realistically too rigid for the site, the circle was then warped to nest the 18 poetic moments throughout the circulation. The central idea of the concept still remains as it encases the mountain and the restored body of water. This precedent applies to this thesis in that it provides extensive knowledge about the essential part of urban ecosystems with programs embedded to make a sustainable and functioning full circle ecosystem.
HYDROGENASE

Year: 2010
Location: Shanghai, South China Sea
Authors: Vincent Callebaut
Size: 480 meters (per tower)
PRECEDENTS
HYDROGENASE

Hydrogenase is a theoretical project that uses the pending new green revolution that is one the rise to merge Engineering, Biomimicry and Architecture. Callebaut theorizes a concept in which man-made algae powered ecosystems are linked to a base on the ground to recharge from the natural energy collected. The project resides on the premise that these ecosystems would also float in the sky using zero carbon dioxide emissions and biofuels. Much like this thesis, Vincent Callebaut hypothesizes that theoretical projects like this are important knowing the damages caused by the Anthropocene and general climate change. The use of Algae as a fuel not only creates ecosystems that do not pollute the Earth but also collect excess carbon dioxide and methane emissions. Vincent Callebaut is an Architect who’s work specializes in theoretical sustainable projects backed by substantial environment research towards a green revolution. It serves as an excellent precedent in terms of premise and narrative. Described as a floating farm, Hydrogenase contains a charging base made of 4 quadrants labeled as carbon wells where the green seaweed deposits the carbonated waste to recycle. On a larger idea, this thus replaces the need for gas stations.
Aerial photo of the Solar Impulse 2 displaying the top 17,000 solar panels that fueled the 23 day journey.
Solar Impulse 2, an innovative airplane clad in Solar Panels, has established a new record in its first complete plane ride around the world using no damaging fuels. Solely using solar Energy, the large plane completed the trip in 23 days, making history in its landing in Abu Dhabi in July of 2016. Its wingspan exceeds Boeing 747's wingspan and contains 17,000 solar cells on its wings. Bertrand Piccard and Andre Borschberg, the two Pilots who flew the Solar Impulse 2, are also the founders of the Solar Impulse Foundation, created in 2015 for the main purpose of solar travels. To this day, they hold the records for the first circumnavigation of the globe using only solar energy. The pilots' main goals with this 40,000 km trip, is to promote the use of renewable energies and general greater quality of life.
84 Tomas Saraceno, "Stillness in Motion installation"
14 Tomas Saraceno, “Stillness in Motion Installation”

14 STILLNESS IN MOTION
Labeled as an interdisplinary art installation, curator Joseph Becker and artist Tomas Saraceno exhibit at the San Francisco Museum of Modern Art their joint collaboration: “Stillness in Motion.” The main idea around this exhibit was the echo the idea of aerospatial life and future tangible scenarios of collective elevated sustainable environments. This instillation is part of a series of projects labeled as “Aerocene”, all of which embody the feeling of floating in the air.
Sectional and Elevational drawings of the theoretical project. Each floatation device is equipped with solar paneling on the roofing with a kitchen at the bottom structure of the balloon. The cable strings directly attach to the existing building in need of rescuing.
CLOUD CITY
Cloud City is a theoretical project proposal for a system of transition into the sky, fictionally set up in Brooklyn, New York. The concept behind this project lies in the idea that in a catastrophic event, inhabitants could attach their existing structure to these cloud-like flotation devices that would have the capacity to pull them out of the rubble and relocate to a safer area, hovering above the iconic New York Skyline. This resonates with this particular thesis in that this design is conceptualized around theorizing a system to facilitates transition into the sky and the final goal of inhabiting the upper atmosphere.
17 Tomas Saraceno, "Photographs of the Ring Bell in action."

17 RING BELL
A ring design concept invented in 2013 that float using solely wind and solar energy. Photographs from installations taken in Germany in collaboration with curator Florian Matzer. Designed to embody a solar orchestra through wind movement, this ring bell uses a triangular structure to optimize structural stability, weight and permeability in order for the wind and sun to flow through the entire object.
18 Solar Bell
This installation, successfully tested in Rotterdam Amsterdam, features a ring design concept that floats using wind and solar energy that is inspired for Alexander Graham's early investigations of bell design based on a modular tetrahedron. The use of reflective and lightweight materials allows for a higher absorption of heat and flying time. The flying sculpture holds the strongest geometrical structure named the octet truss.
NARRATIVE
PROGRAM

Image created by author. Title: "Look up."

LOOK UP
Conceptual Illustration to generate the view from Earth Ground, looking up to the new era of the Aerocene.
The essential components that make up a successful man-made ecosystem, along with the intricate scientific breakthroughs that have led us there, should be valued and acknowledged. Most of these intricate factors were pivotal to our ability to maintain our life up above. However, these details are beyond the point of our story. Our resilience predominantly revolves around the migration of modern-sapiens and their transition into a new era.

Look up.

Think of this as the most colossal case of gentrification in history. Sixty years ago, any individual who would look up from where they are standing would see an occasional bird or plane hovering in the clouds.

Now, we are all neighbors in this seemingly endless universal territory. together we are one country, sharing the same land. the perspective seems skewed, because all the establishments closest to you are the smallest and newest additions. the further you look, the bigger the bubbles appear. It seems unfathomable that after all the advancements and progress we have made, humans continue to forster timeless societal issues and visible hierarchies. however, social change has historically had a slower pace than technological ones. therefore, the newest and poorest communities hover of the remnants of oceans, where the air is warmer and almost legally toxic. the main large bubble up above, is the central city with the cleanest air and most habitants. the bubbles that surround the main city are glorified suburbs.

Another way to perceive this could, of course, be that our global move to the sky embodies a beautifully entangled relationship with our atmosphere. one could interpret the “cosmic anxiety” as a small side effect that comes with the aerocene urbanism. with the survival of our species made possible through this merge, many view this lifestyle change as an example of the sublunary, belonging to this world as a contrasted improved version.
CONCEPTUAL PLAN OF CITY STRUCTURE
Embody a hierarchy among the scale of interventions and puts focus on the main larger entity that represents the central dense city. The idea behind this theoretical floating country is to embody the technological advancements as well as the persistent theme of hierarchy lagging from the past and current societies. Therefore, the thesis utilizes familiarities in daily life to ground one in the theoretical idea of the aerocene.
Image created by author. Title: "Conceptual Aerial Render", Note: The ground condition is illustrated as a post-flooding area with the floating cities hovering above.
SITE
PROGRAM (INDIVIDUAL)

CONCEPTUAL SECTIONS OF INDIVIDUAL SOLAR BALLOON ECOSYSTEMS

Each aerosolar balloon is comprised of a light balloon mylar fabric that traps heat in its chamber. It is then attached to a solar ring, which seals the heat chamber and allows the balloon to remain proportional to the ecosystem that sits underneath. The attached ecosystem is tied to the solar objects through thick high-tension cables that anchor the man made ecosystems. This program structure is derived from artist Tomas Saraceno aerosolar journeys and solar ring bells, as well as the theoretical project by clouds architecture office who used a similar approach to floating concepts fueled by alternative energy.
Program Precedent

16 AEROSOL JOURNEYS
Installation artist Tomas Saraceno has taken on several projects that revolve around creating floating objects that are powered solely through wind and solar energy. The artist has had several collaborations in Massachusetts (MIT Campus), Perth in Australia, Dresden in Germany and Barcelona in Spain. After several successful trips, an aerocene website was created to publish this interdisciplinary artistic endeavor and ethical collaboration with the environment in times of climate crisis. Further research continues on the aerosolar balloons with a collaboration with MIT to track a balloons journey based on the weather and geographic conditions.

16 Shankiya, Sham, "Saraceno Aerosolar Journeys"
NARRATIVE
PROGRAM (INDIVIDUAL)

In our merge into the Aerocene, we have managed to plagiarize The Earth's work by making our own animals, farms, foods and landmarks.

Our obsession with the natural world is not instinctual; it is sentimental. Our sentiment towards this, however, is instinctual. We long for this, simply because we cannot attain it.

Out of panic and nostalgia, we began to deeply pursue this idea of nature as a necessary means for a healthy and progressive lifestyle. Perverting the original nature of the Old World with our own graphic representation of it. We love nature, but only when we get to pick what it does.

Therefore, we appropriate these long-forgotten species to tailor to our needs. Which is why, virtually all establishments in these cities would become manifestations of naturalism, overtly derived from systems, shapes and forms that were found on the antiquated Earth bed.

By the time we reached Stage 6, the ground bed of the Earth lay almost barren. It was once we began to emerge inside these bubbles, that the idolization of conceptualized nature blew out of proportion.

Yearning for our previous lifestyles, or maybe their idealized concept of hunter-gatherers, we began to construct dwellings to emulate the feeling of being immersed in nature, by next century standards of "nature", of course

while we reside in the Aerocene, we continue to outrace the relentless evolution of climate change, All amid Earth's productive healing process, we continue to support the rehabilitation of our disowned ground, while retaining hope by letting our utopian imaginations of the future run wild and free,
NARRATIVE
PROGRAM (INDIVIDUAL)

As a child, I lived in the typical suburban home. Koren would tie the rope to two sticks and I would dip the rope in the bucket of watered down soap. We would each grab one stick, and in unison, run down our block, letting the bubbles trace our path. I have fond memories of this time, it was my home, and it was always in the same place.

I sit at the Bottom Community Park and look up to see what reminded me of my childhood memories where different sizes of bubbles swarmed my vision. Although I was engulfed in nostalgia, I couldn’t seem to remove the adult lenses I had learned to wear for the last sixty years.

It was indisputable that the ground bed of the Earth had become the soiled water that embodies the remnants of the vintage world. All the while, we float well above our old land, in the clouds, where the air is cleaner and pure.

The Aerocene took rise in a global plan of 6 Stages, the first one, consisted of the development of solar balloons. Once buoyant solar balloons began to rest with agility in the lower stratosphere, the atmosphere started to populate, and geologists came to speculate that we had entered a new era, one that would be eventually be named, the Aerocene. Next, came the balloon’s journey into the sky, which proved to be well-timed, since catastrophic reverberations of climate change were picking up pace.

Later, Stage 3 was set in motion, using spiders as a dominant precedent. Genetically modified arachnids were developed to construct the gargantuan structure that currently holds our reinstated aerocities, using spider silk. It was a time where the imminent technological and biological revolution’s “Golden Age” rose to a crescendo.

Accordingly, Stage 4 was deployed next, where the construction of this silk structure took place, and whose predominant role was glorified rebar. Eventually, algae would be farmed and exploited for its energy, over the entirety of the skeletal silk.
Although the concept is based on fictional medias, The Universal Orbital support system (UOSS), a concept where the foundation is space based orbiting from an asteroid by suspending tension cables, now has been successfully tested on by the European Space agency during its Rosetta Mission. Which is why the Cloud Architecture Office has made a theoretical project in which a new tower typology is suspended in the air. The Proposal for the Analema Tower is to be constructed in Dubai but its location would ultimately be constantly changing, orbiting to and from the northern and southern hemisphere in a consistent loop. This tower project would be the tallest skyscraper ever built.
Whether this thesis is resolved through cosmic orbiting or solar balloons, the communities will be constantly moving, even if the inhabitants aren't able to feel it. Therefore, a country no longer relies on land boundaries or a specific location. In a way, sapiens are merging back to nomadic lifestyles met with drastic societal and biological changes.

What does the world look like after the Aerocene merge? The reason why the world map looks the way it does is arguably mostly natural, apart from geographic boundaries set by humans for territory separation. Therefore, in an aero man-made world, a city's location becomes relative to all the other cities' location because countries no longer take the shape of natural lands of earth but of the shapes of floating ecosystems.

To better grasp the movement of these floating cities, MIT's "Float Predictor" for the Aerocene Project was used to estimate a reliable trajectory based on current weather conditions. The results indicate continuous orbital movements with the use of any kind of Aerosolar balloon. The movement that each ecosystem would experience still remains minimal at roughly 1.3 mph.
Whether this thesis is resolved through cosmic orbiting or solar balloons, the communities will be constantly moving, even if the inhabitants aren't able to feel it. Therefore, a country no longer relies on land boundaries or a specific location. In a way, sapiens are merging back to nomadic lifestyles met with drastic societal and biological changes.

What does the world look like after a aerocene merge? The reason why the world map looks the way it does is arguably mostly natural. Apart from the distinct country boundaries engineered by humans, we are not responsible for the design of the world map. What would it look like if we did design our communities?

The "Conceptual New World Map" illustration on the right overlays a typical and current world map with the new man-made ecosystems floating well above. It is important to note that the new territories no longer take the shape of the land that sits directly below. Ultimately, the ground bed of the Earth is abstracted and territorial boundaries set by humans no longer exist below the sky. One could argue that this new organization of "cities" and "countries" reinforces the movement of the Aerocene in that it leaves the Earth's original land boundaries as the only factor in its land shape.
This sublunary proposes that the global population accepts this merge into aerospace. Therefore, this narrative is not particularly site specific; however, it is hypothesized that cities that are most vulnerable and over-populated would seek refuge in these floating cities first. Five cities, each with varying cultures were selected to initiate the transition into the Aerocene:

1. San Francisco, CA, USA: large scale fires, drought, earthquakes, rent inflation
2. Miami, FL, USA: rising sea levels, hurricanes, tainted/polluted waters, red tide
3. Venice, Italy: rising sea levels, flooding, tainted waters, lagoon wave-movements
4. Bali, Indonesia: volcanic eruptions, monsoons, flooding, greenhouse emissions
5. Tokyo, Japan: earthquakes, tsunamis, heatwaves, pollution, heavy flooding

It is expected that the merge will take place in several waves. The first group of cities would include the most densely populated cities during an emergency evacuation. The next wave of cities that would follow are cities that are less populated and whose land is decaying at a slower pace. All in all, the transition will happen gradually and on a need basis.
MERGING REALITY
An architectural thesis narrative, exploring investigations into the future through realistic representation by Fang Fan, 2016 thesis. Fang Fan claims the central idea of this thesis as: "The project is presented as photographs from the future city, using photo realistic imagery as a way to suggest a series of events and impressions of space, bridge sense of fiction within an familiar set of views and spaces. In some views the interventions are barely perceivable, and in others obvious and featured. All images collectively suggest the idea of a tangible future illustration. Therefore, the author uses aspects that we are familiar to showcase unfamiliar future settings. Merging Reality is also a non-site specific thesis who site and program is driven by the aesthetics of the drawings, as the atmospheric representation serves as the site. This narrative resonates with thesis because it uses a similar premise of a future world after globalization and unifications of the people."
REPRESENTATION
SITE/AESTHETICS

BIO RING
Julien Nolins' theoretical project is in response to recent climate pressures to explore alternative methods of fueling due to depleted resources and climactic changes. The project therefore sets out to repurpose a delapitated offshore oil rig, located off the coast of the Canadian Atlantic, the blighted oil rig is the perfect setting as it is in the a tangible future, where petroli um fuels have been completely used. The structure remains relatively the same, all the while ironically living sustainably within its typical environment using renewable fuels such as algae.
REPRESENTATION
SITE/AESTHETICS

AMAZONIAN PIER

A theoretical project by Julien Nolan about experiencing "the amazon, without going to the amazon" (Nolan). Set to be located in the middle of the Amazon Rainforest in a city named City of Manaus known for its Free Trade Zone, the thesis uses whimsical images to produce a critique of the Free Trade Zones and ultimately proposes an intervention of an industrial belt in the format of a fantasy pier by joining mechanical manufacturing and the mass-produce industrializing with the aesthetics of an amusement park. This is satirically juxtaposed with common themes of overconsumerism, mass manufacturing, tourism and pleasure.
23 Julien Nolan, "Amazonian Pier", Entrance

23 Julien Nolan, "Amazonian Pier", Tower of the hour

"Cross Experience the Amazon. Enjoy Pony ico the Amazon."
Progress Section of the Aerocene during SD Review, showing progression of exercise throughout the semester, contrasting the final section of the Aerocene.
REPRESENTATION
RETHINKING DESIGN CONVENTIONS
Drawing with sectional qualities

Aerocene
Dwellings
Inspired by our representation of DNA
REPRESENTATION
RETHINKING DESIGN CONVENTIONS
REPRESENTATION
RETHINKING DESIGN CONVENTIONS

Orange Press
Bed Bath and Beyond

Orange Press
Philippe Starck

Teapot
Ikea

Teapot
ceramics project
Model
Aerocene

Model
Aquatic Center
BIBLIOGRAPHY


Fan, Fang, "Imaging the Near Future" (2016). Architecture Senior Theses. 334


