

Architecture and Sustainable Design / SUTD
Core Studio 2 2022: The Digital Archive

The Proto-Cemetery

“The Falls”

by Jeremy Yeh

Project Statement

Every time a world defining event occurs, human behavior and patterns change drastically across the globe; the discovery of vaccines, the invention of the light bulb, the industrial revolution, etc. Each of these events has shaped the world to be what it is today.

My project speculates the end of most of the world 150 years into the future, as climate change raises the sea level above what most cities are built on today. The Falls is a cemetery built at the edge of civilization, considered non-essential to life, yet of sufficient necessity to be built anyway. Funerary practices and rituals drastically differs from what we have today, while technological advancements and evolution in human understanding of memories have reshaped how we remember the dead. The project expands the scope of architectural problems to include these speculative changes in human behavior, programmes and systems, and is a response to future challenges through both physical and digital engagement.

Relevant Research, References and Inspiration

<Speculative References - Technological Fiction>



<Simulating loved ones & implantation of consciousness>

<Speculative References: Environmental Future>



- Climate change, temperature rise, lack of freshwater (drying of lakes, melting of glaciers, pollution of groundwater)
- Extreme weather
- Inundation of cities from rising sea level
- human accelerated natural disasters, earthquakes, volcanos, typhon, and tornado
- Cities abandoned, population displaced



<Future where current problems are not solved>

<Speculative References: Environmental Future>



- Social Issues Exacerbated
- Limited space dedicated for cemeteries
- Socio-economic divide for after death care
- Places to pay respect to the dead are more vertical due to space constraints



<Effect on society and death>

<Speculative References: Environmental Future>



- Cryonics
- Recompose
- Idealized way of laying the dead to rest, respects the dead and the environment



<Effects of encompassing a future with green urban environment>

Group research: Methods of body disposal that is environmentally conscious

<Cultural Research: Structure of Cemeteries>



1) Visitation



2) Committal Service



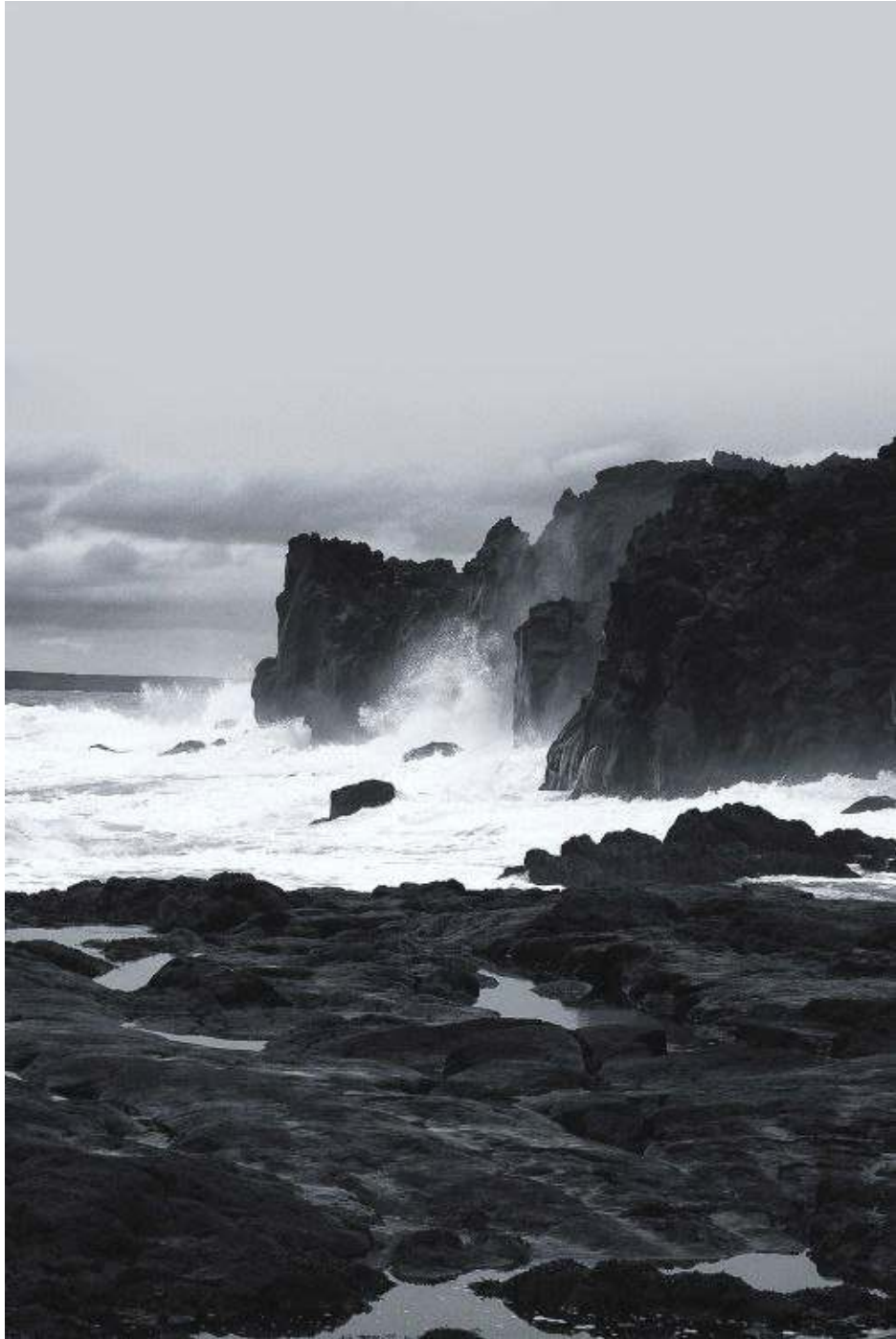
3) Funeral Ceremony



4) Funeral Reception

<Cemetery Programmes>

Group research: Programmes in cemeteries





Captured from a PlayStation®4 Pro. 4K images require a 4K display.



Atmospheric and vibe references

Reading Response

Critical Reading 3: Aristotle – On Memory and Reminiscence

In *On Memory and Reminiscence*, Aristotle discusses the nature of memory and remembering. The act of remembering or recalling a memory may seem so natural and instinctive to us, yet we do not consider the deeper meanings of what remembering is; why can we remember some things but not others, and why our recollection of the past may differ from what actually happened? What intrigued me the most about this text was Aristotle's definition and explanation of how one remembers.

Aristotle recognized that the nature of a memory implies elapsed time. We do not remember the future or the present. "Memory relates to the past," and "to remember the future is not possible... nor is there memory of the present, but only sense-perception" (Beare, 2010). Hence, the capability to remember stems from the ability to perceive time, as one cannot have a memory of the past when they don't distinguish between what has happened and what is happening.

In addition to one perceiving an event as the past, the event must be – as Aristotle stated – presentable. "All objects capable of being presented are immediately and properly objects of memory, while those which necessarily involve presentation are objects of memory incidentally." (Beare, 2010). Yet presentations of events may differ from facts of the event, and as such, it becomes "clear that we must conceive that which is generated through sense-perception in the sentient soul" (Beare, 2010). Hence, memories form from these different impressions that an event makes on a person. Aristotle likened this "impression of the percept" to an "impression with a seal" (Beare, 2010), and explained that for the same reason the "very young and very old persons are defective in memory" (Beare, 2010).

In relation to our Core Studio, these insights on memories and the deeper investigation into how each person make different impressions on the same events allows us to better understand and craft how visitors can remember their deceased loved ones. When it comes to remembering the dead, perhaps having more personalized experiences tailored to how each person remembers their loved one would be more apt in creating closure.

Bibliography

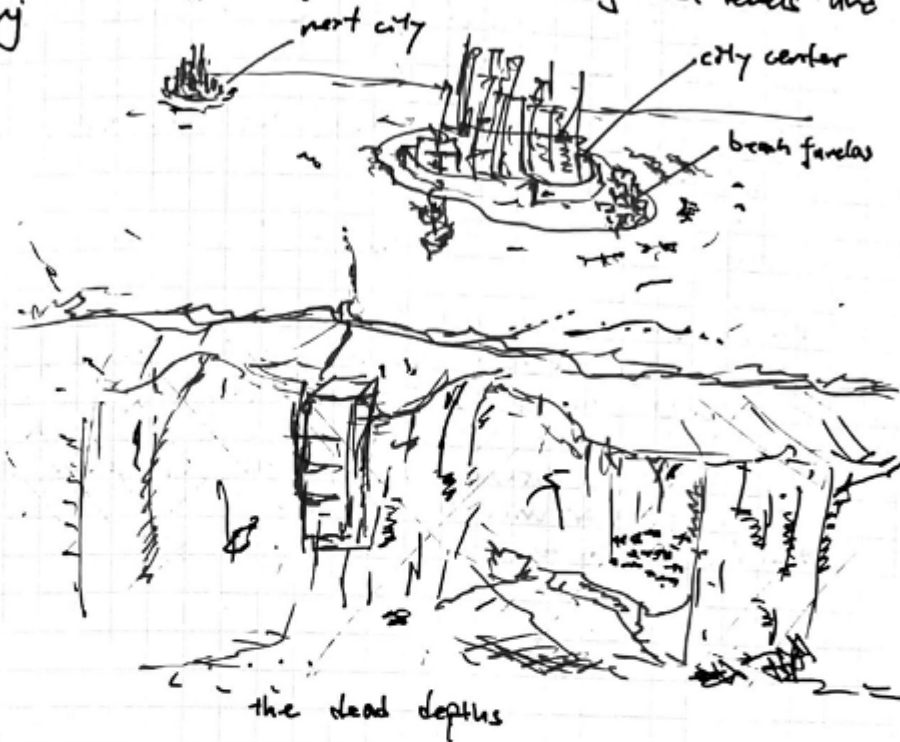
Beare, J. I. (2010). *On memory and reminiscence Aristotle (ca. 350 b.c.)*. *Annals of Neurosciences*, 17(2), 87–91. <https://doi.org/10.5214/ans.0972-7531.1017208>

Narrative

Least space becomes too precious for non-life supporting facilities such as cemeteries

↳ Cemeteries are pushed out of the city towards the border between inhabitable and uninhabitable

↳ these places are ^{often} submerged due to rising sea levels and flooding



Main method of final disposition: water burial

↳ low carbon impact, as opposed to cremation & land burial
↳ convenient with location ⇒ underwater ^{⇒ banned and phased out}

Why on a cliff?

↳ bodies disposed in the water need to be weighed down

↳ on flat ground bodies will remain visible while being consumed by marine life

↳ skeletal remains also will be visible.

↳ hence, situating on a cliff, the deceased are dropped off into the depths respectfully

New Narrative

All civilization exist only at higher ^{altitudes} ~~elevations~~ now

↳ rising atmosphere

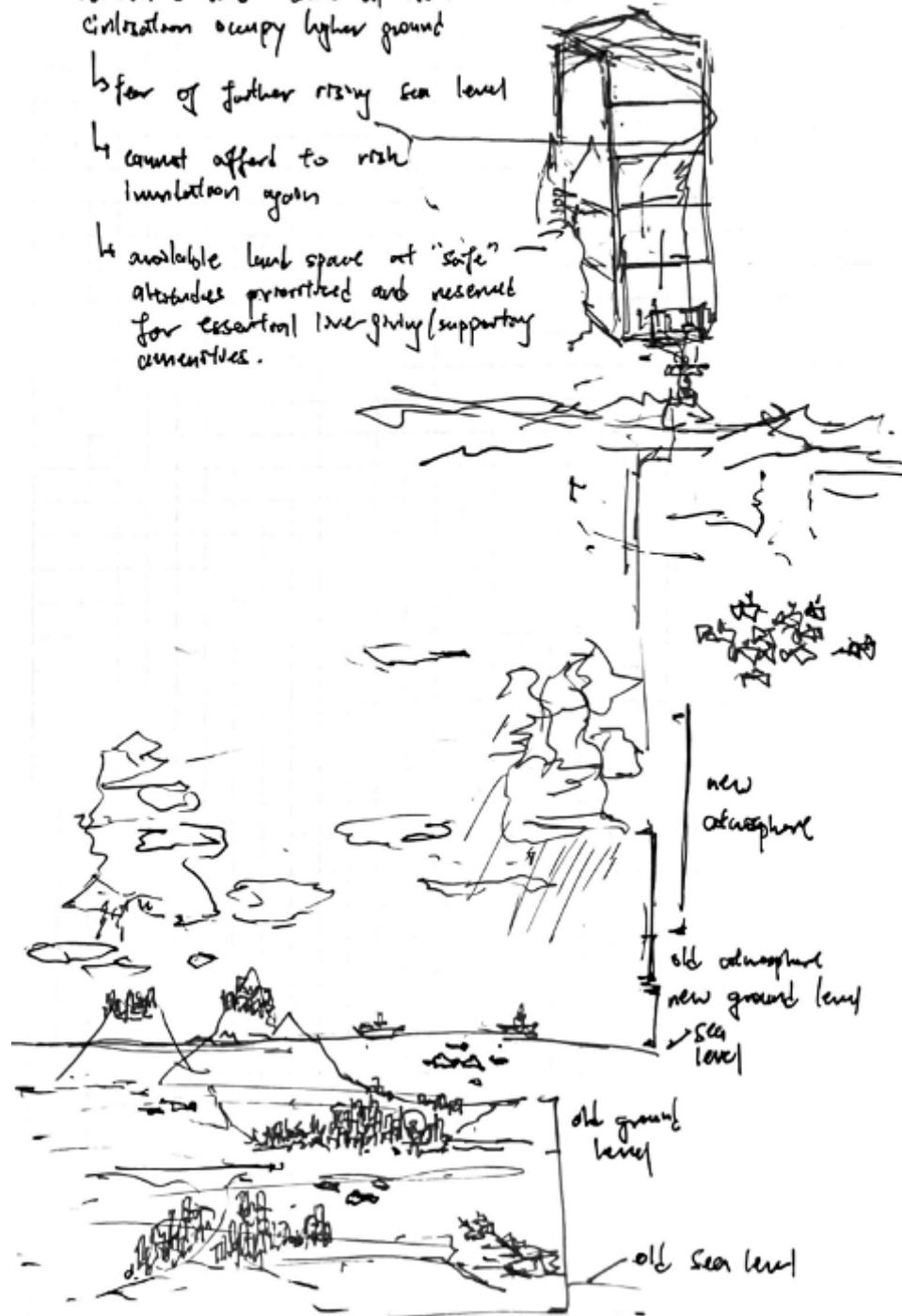
↳ inundation of most land masses today

Cemeteries are located at new sea level while civilization occupy higher ground

↳ fear of further rising sea level

↳ cannot afford to risk inundation again

↳ available land space at "safe" altitudes prioritized and reserved for essential live-giving/supporting communities.



Narrative

The war on climate change was a global one. Yet, it did not take long for humans to turn on each other. **Rising sea levels** first took Kiribati, a small island nation in the central Pacific Ocean. But people didn't take it seriously. Then, larger cities started to disappear underwater; New York, Venice, Tokyo were the next to follow. Countries started to **run out of space**, and **war** broke out to desperately acquire more habitable land. Entire nations engulfed, millions of lives sacrificed, and the remainder displaced. When the war ended, sovereignties no longer had any meaning. There was only one nation, Earth.

After the mass inundation, **land space is disproportionately scarce** compared to the amount of people that needs to occupy it. Together with the sea level, what we used to know as the **ground level has shifted up** into the mountains. City-colonies are built at high altitudes, far from the Oceans, to minimize the risks of flooding again. Habitable land that is still considered safe by the authorities is **packed beyond saturation** by these cities and prioritized for life-giving or life-supporting infrastructure. Services such as deathcare or recreation which are no longer considered as essential are **pushed to the boundaries** of the cities.

Climate change will happen with and without us, but human actions play a part in accelerating its effects. We learned from our mistakes and worked sustainability and environmental-conscious methods into all aspects of life and death, including how we dispose of the dead. Funerary rites with **high carbon footprint** and pollution such as cremation and land burials have been **phased out**. When sending off the dead, people turn to what is concurrently the progenitor of life and the harbinger of death – the Ocean. **The Ocean is the mark of death**. As the Ocean claimed the millions of lives when the floods came in, it has become the embodiment of Death in itself. Thus, **water burials** have become a common practice across all colonies. Water burials also bear no carbon footprint, keeping in line with the established **sustainability** and carbon-emission standards.

The war may have wreaked chaos, but it also fueled **technological advancements**. Artificial intelligence and virtual reality were so developed that it was used to simulate hand-to-hand combat training during the war. Today, we use it to remember the dead. Should one have made the necessary arrangements, a simulation of their consciousness is made after death, giving their loved ones an opportunity to achieve closure. Their body decomposes at the bottom of the Ocean, but the soul continues to live, albeit in digital form.

References

Oblivion (2013 film)

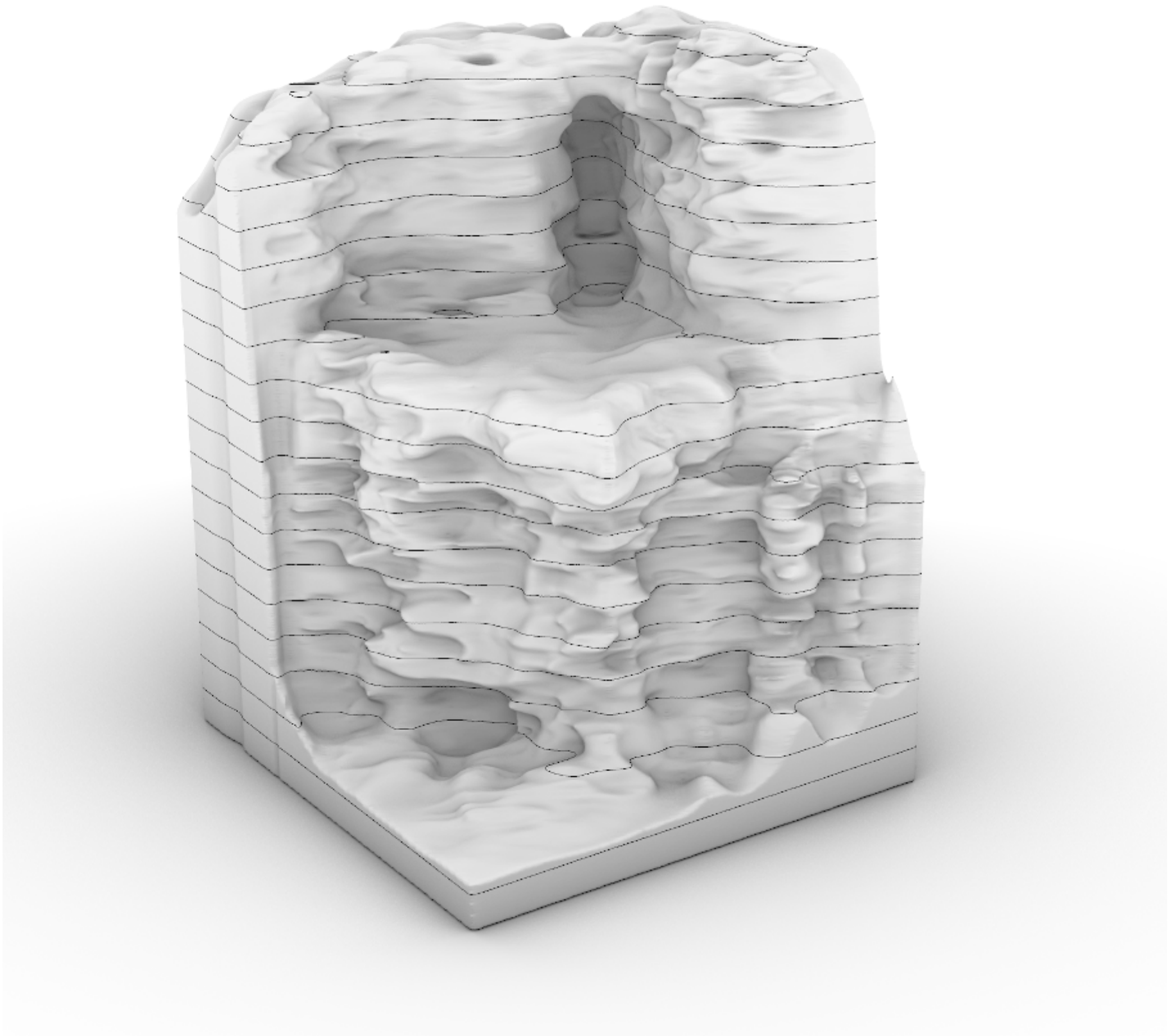


First collage



Second collage

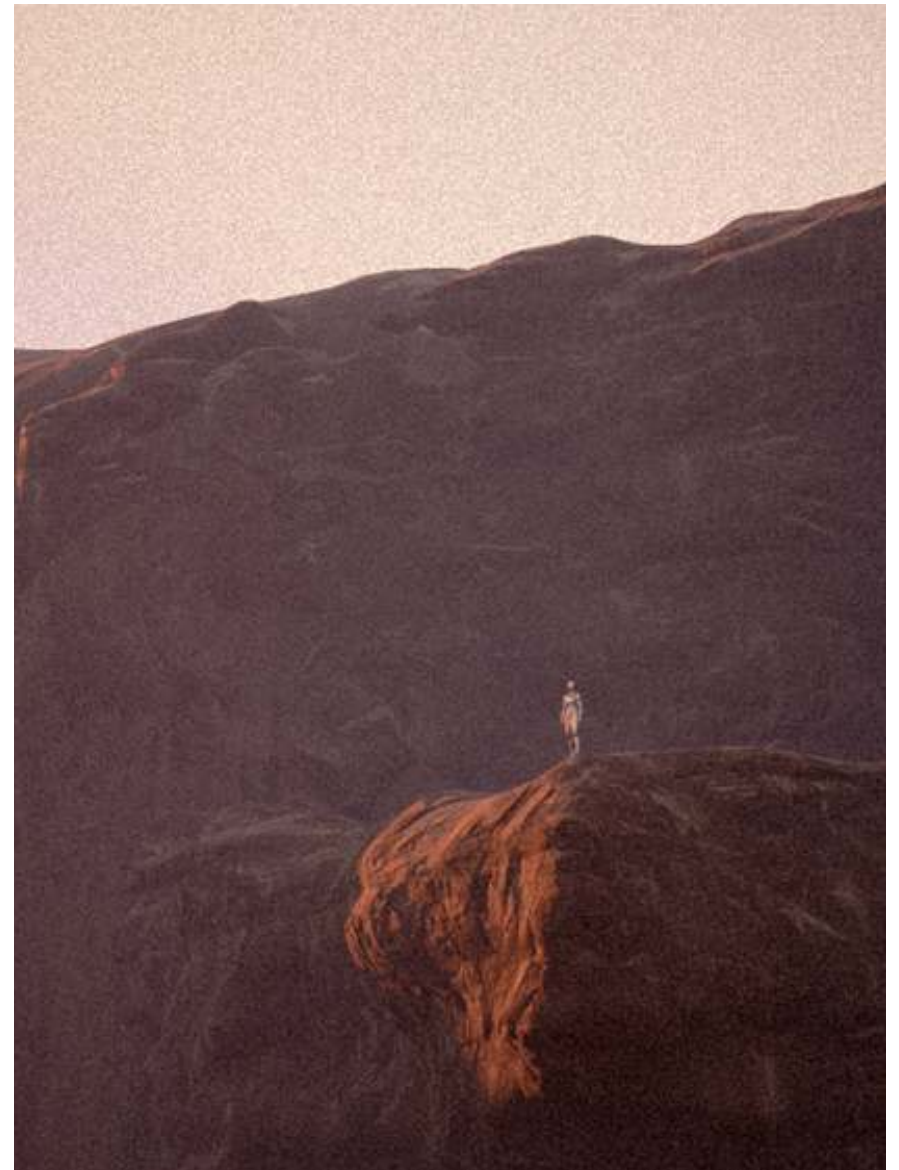
Site Development



Development of site

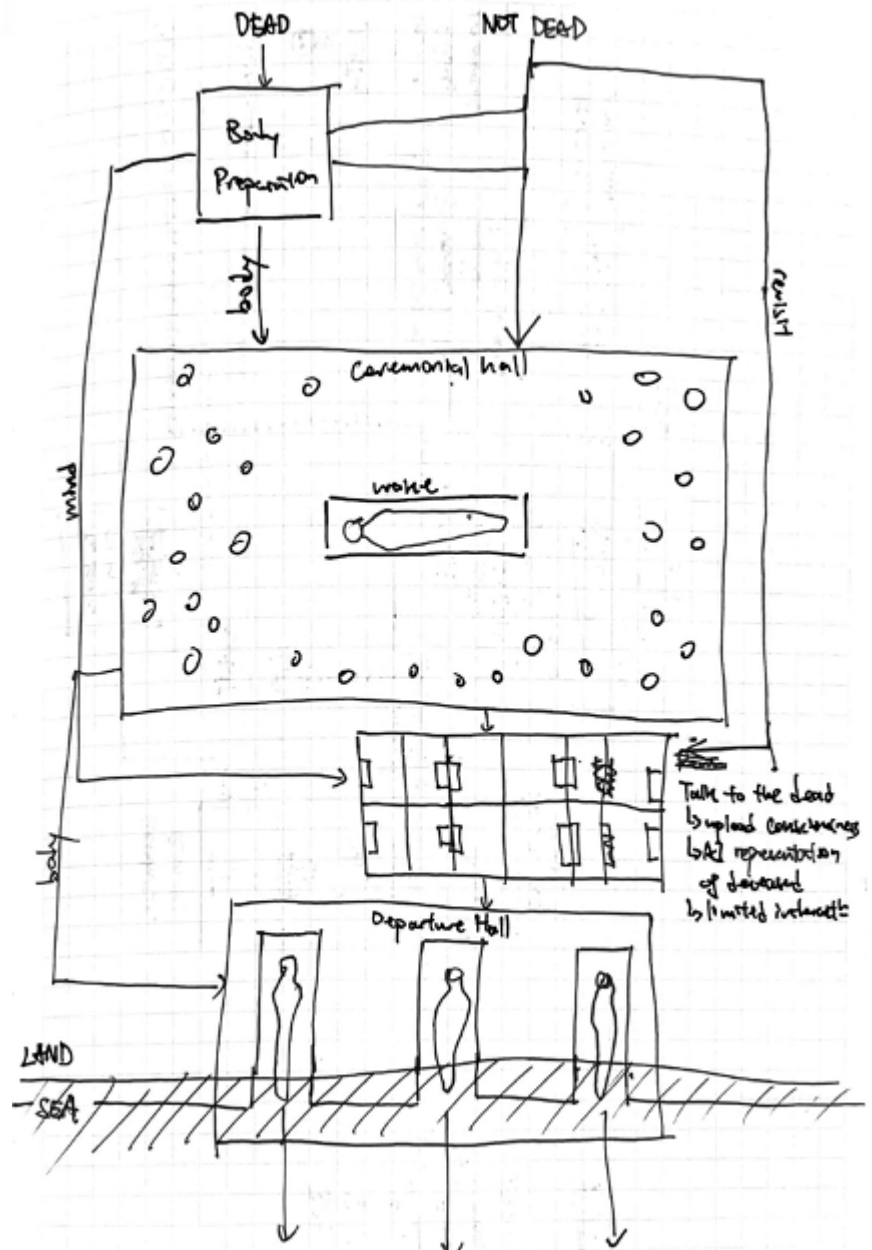
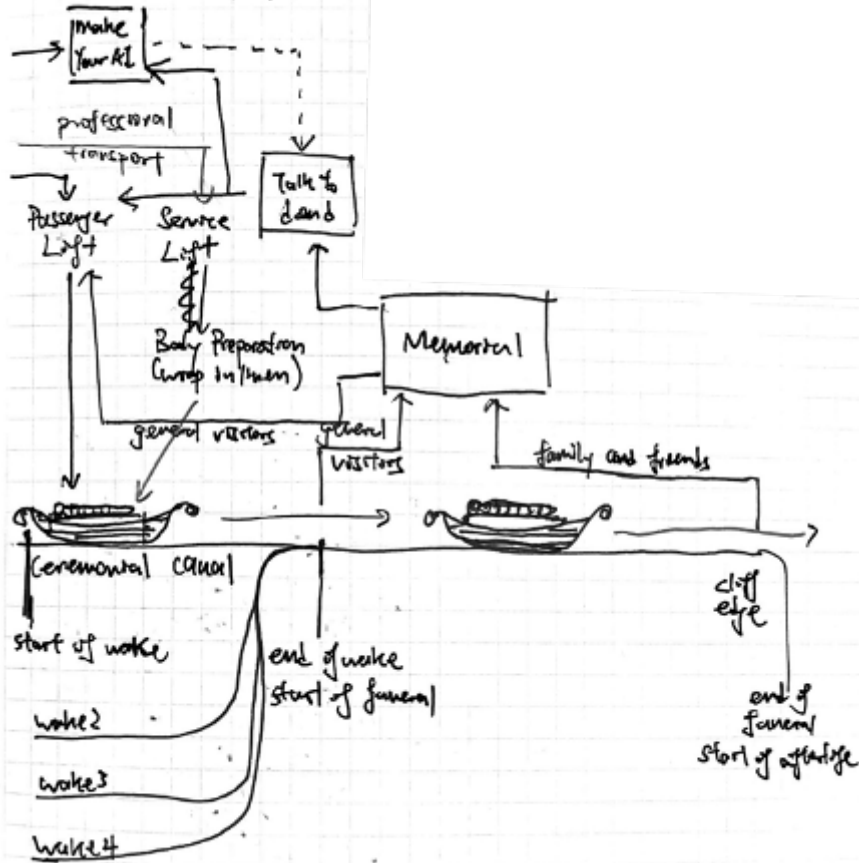
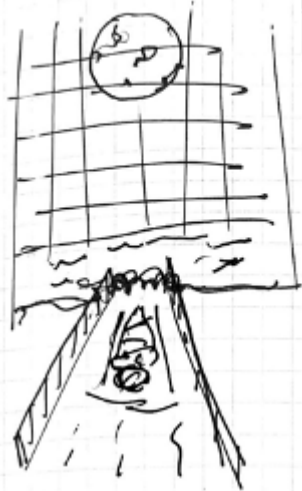
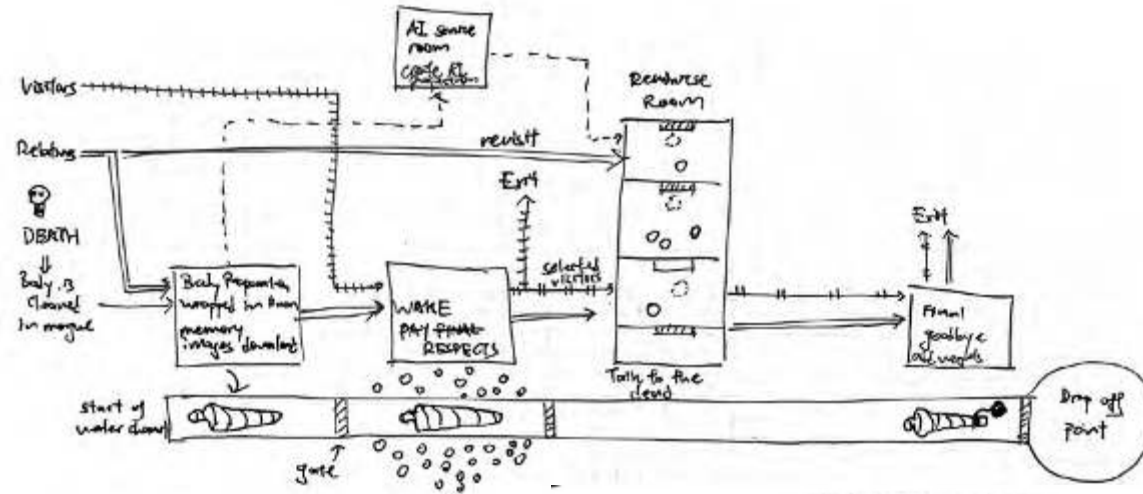


Physical model of site

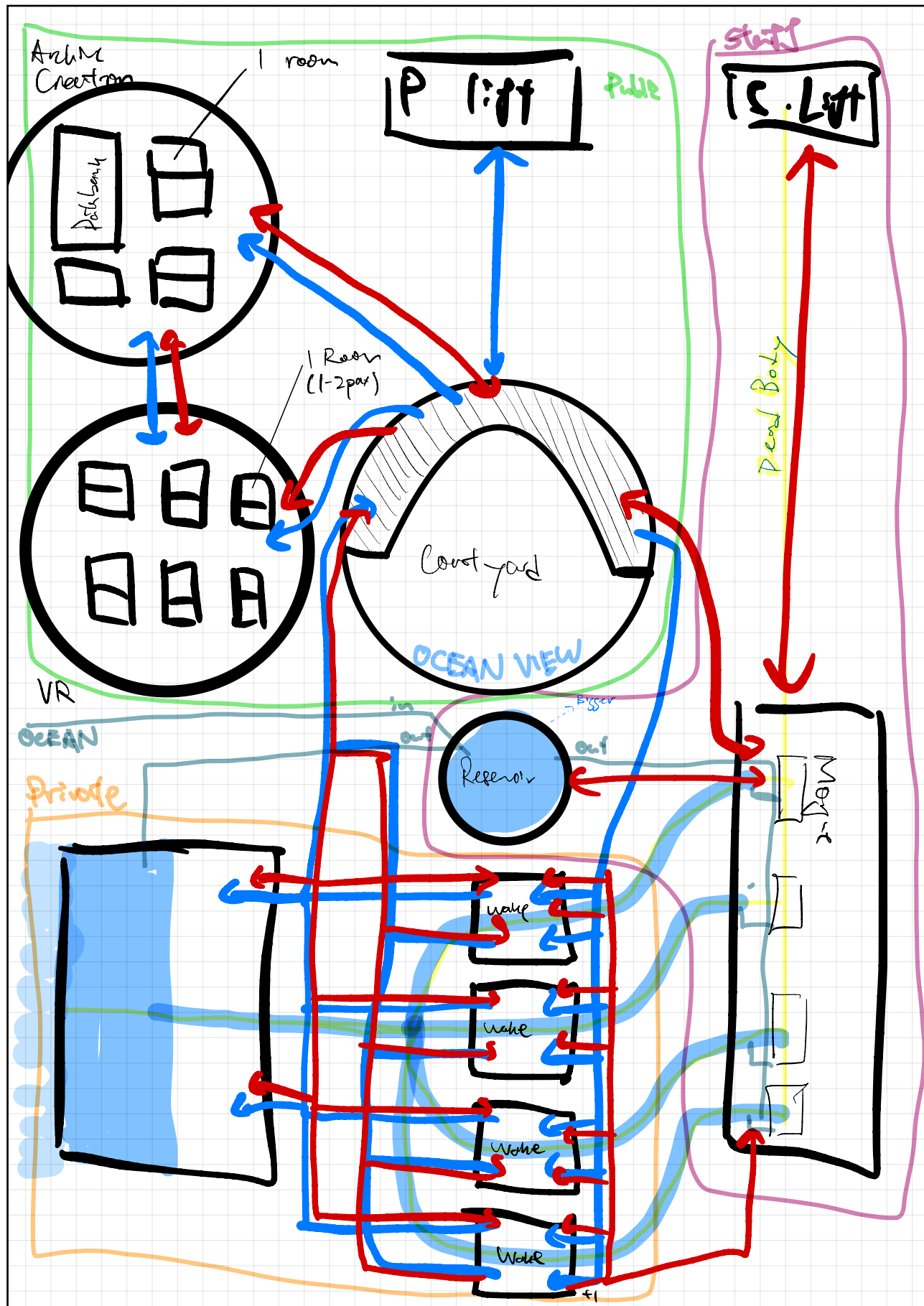


Screenshots of site in UE5

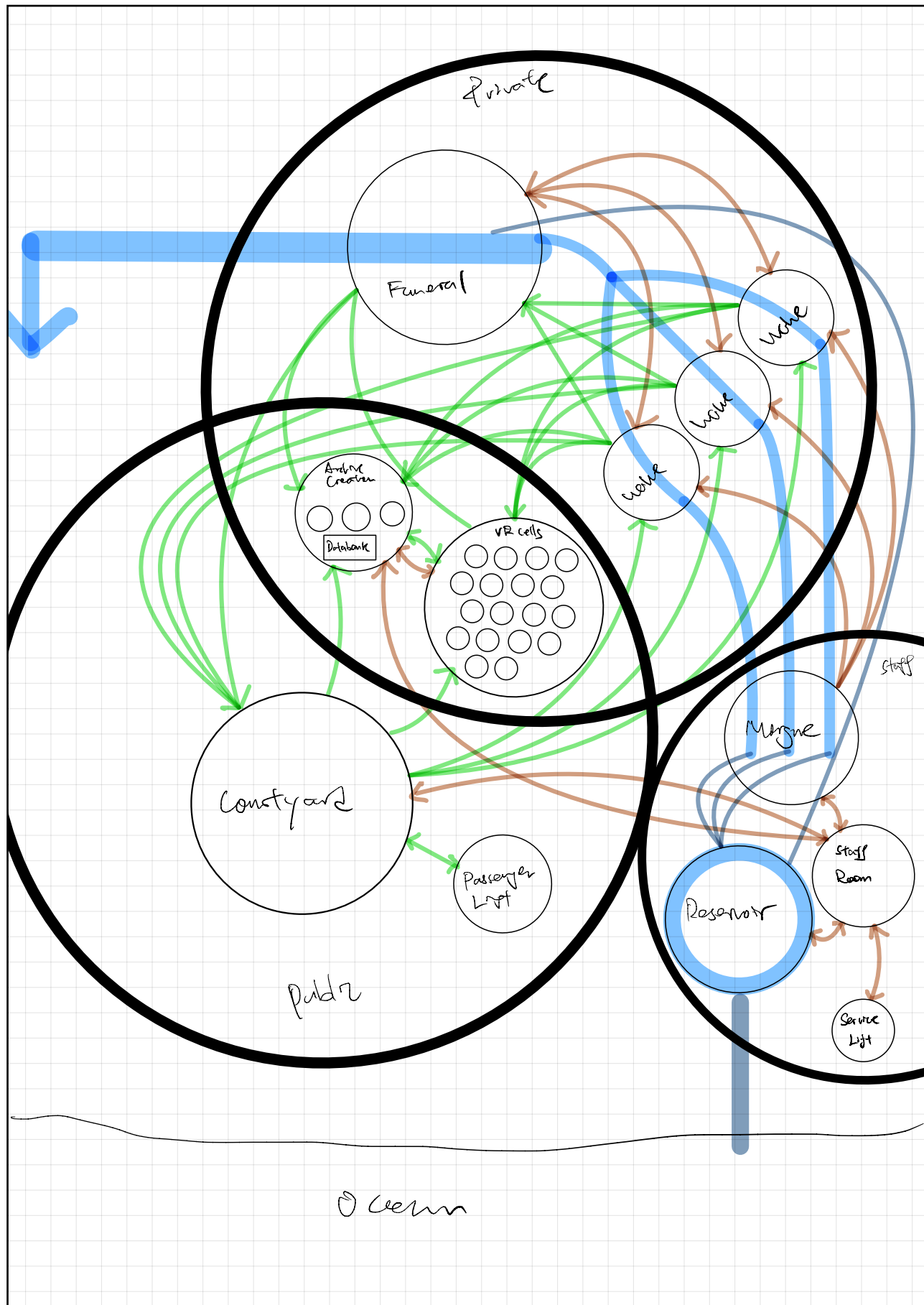
Concept Development



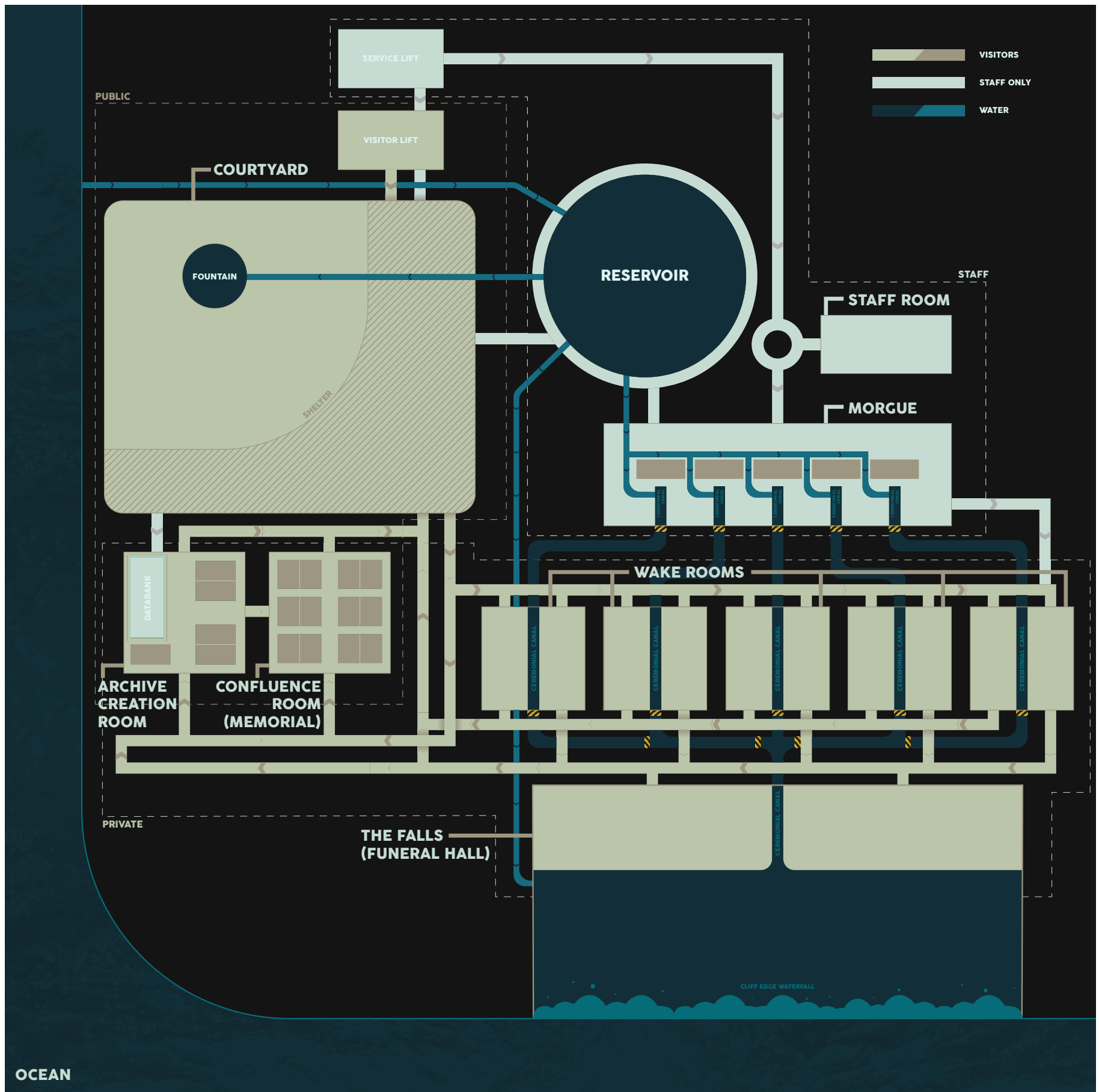
Conceptual/circulation diagram sketches



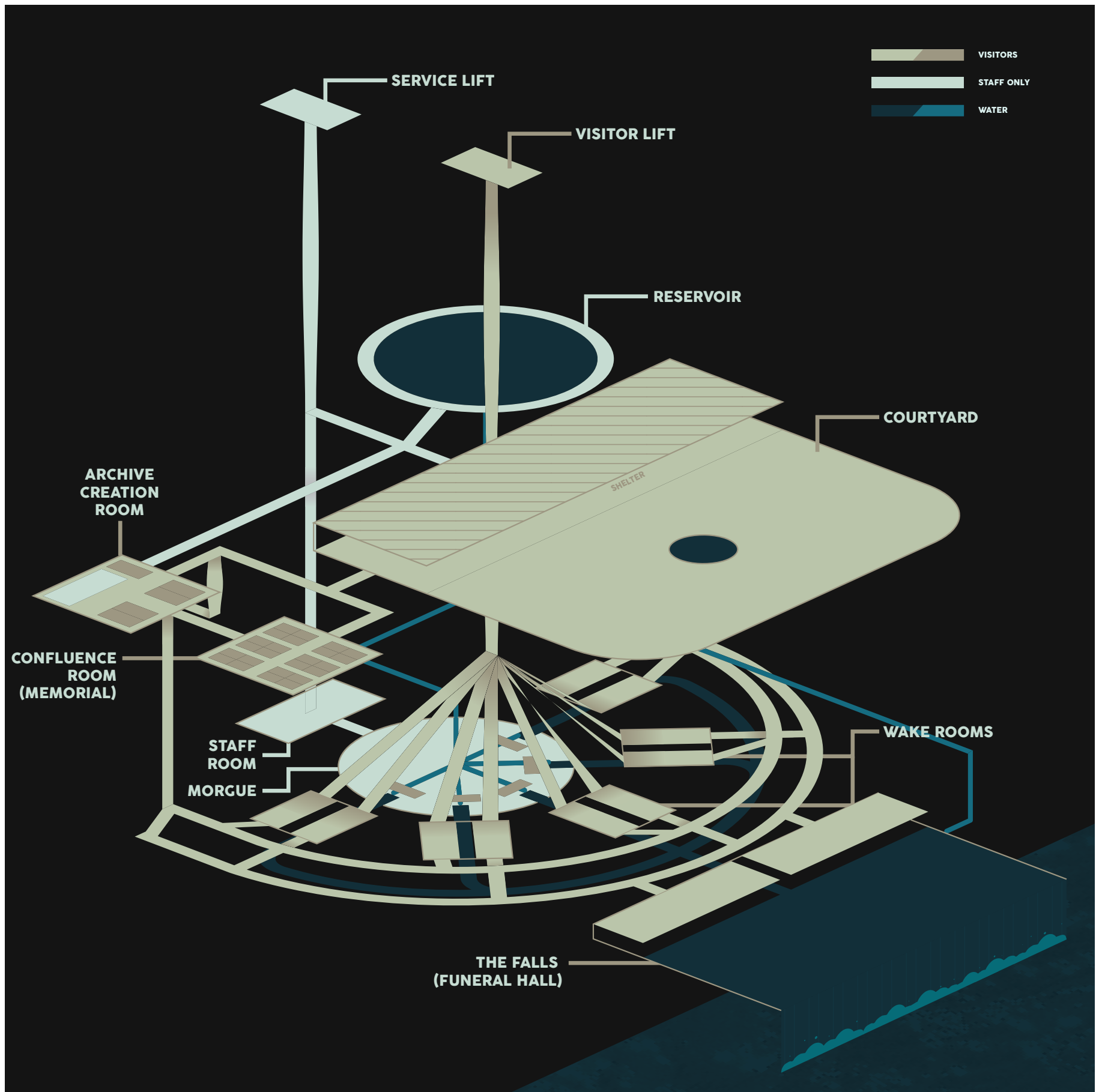
Conceptual/circulation diagram sketches



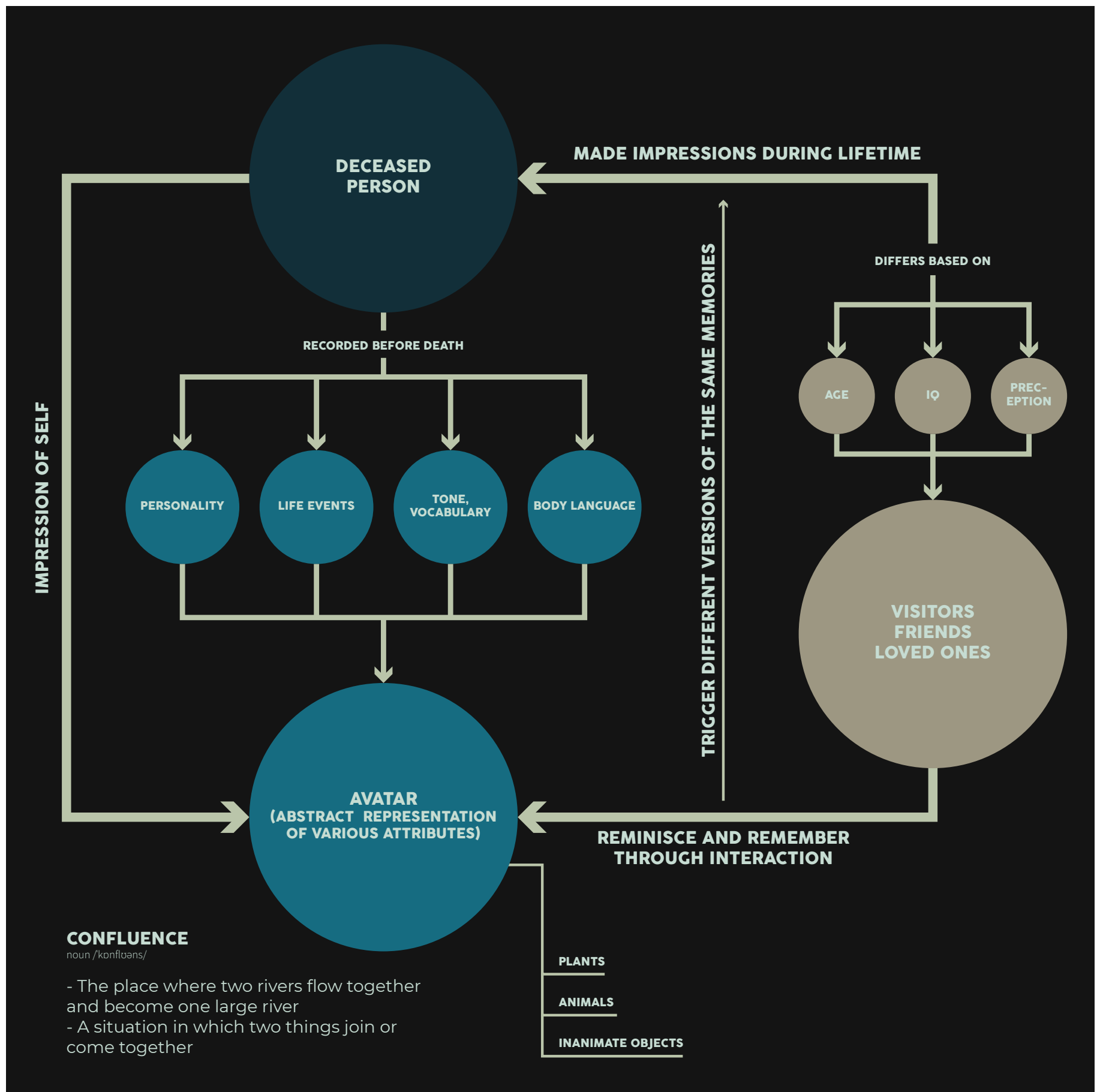
Relational diagram sketch



2D concept diagram



3D concept diagram



CONFLUENCE

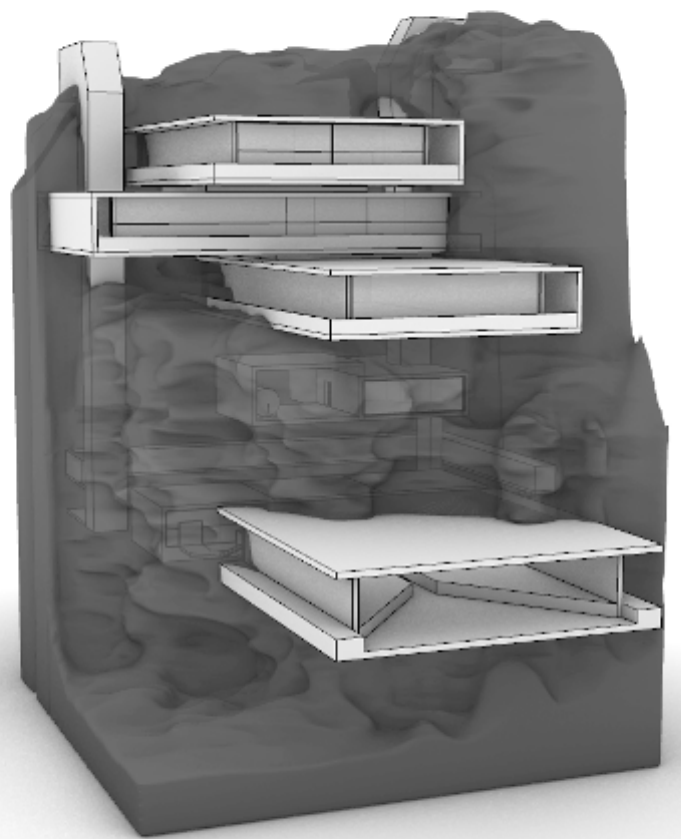
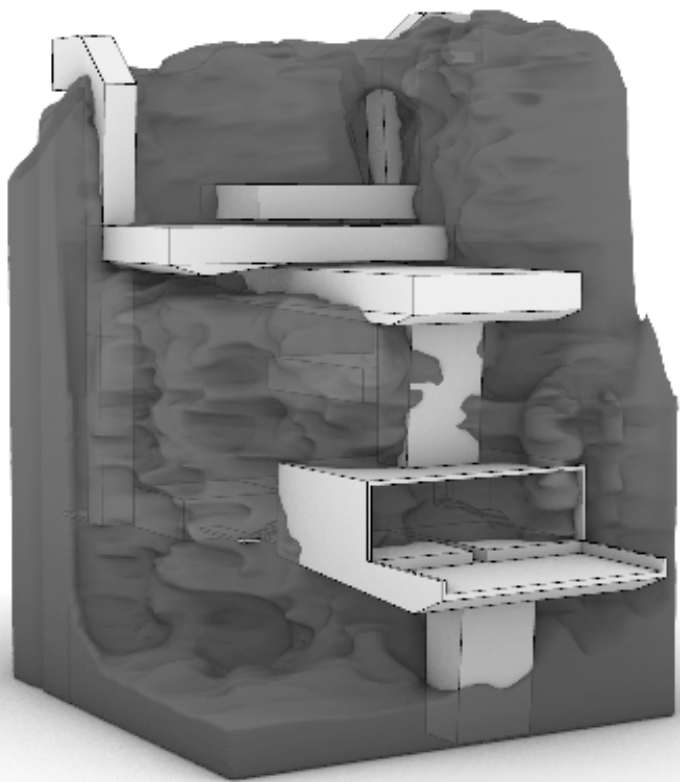
noun /kɒnfluəns/

- The place where two rivers flow together and become one large river
- A situation in which two things join or come together

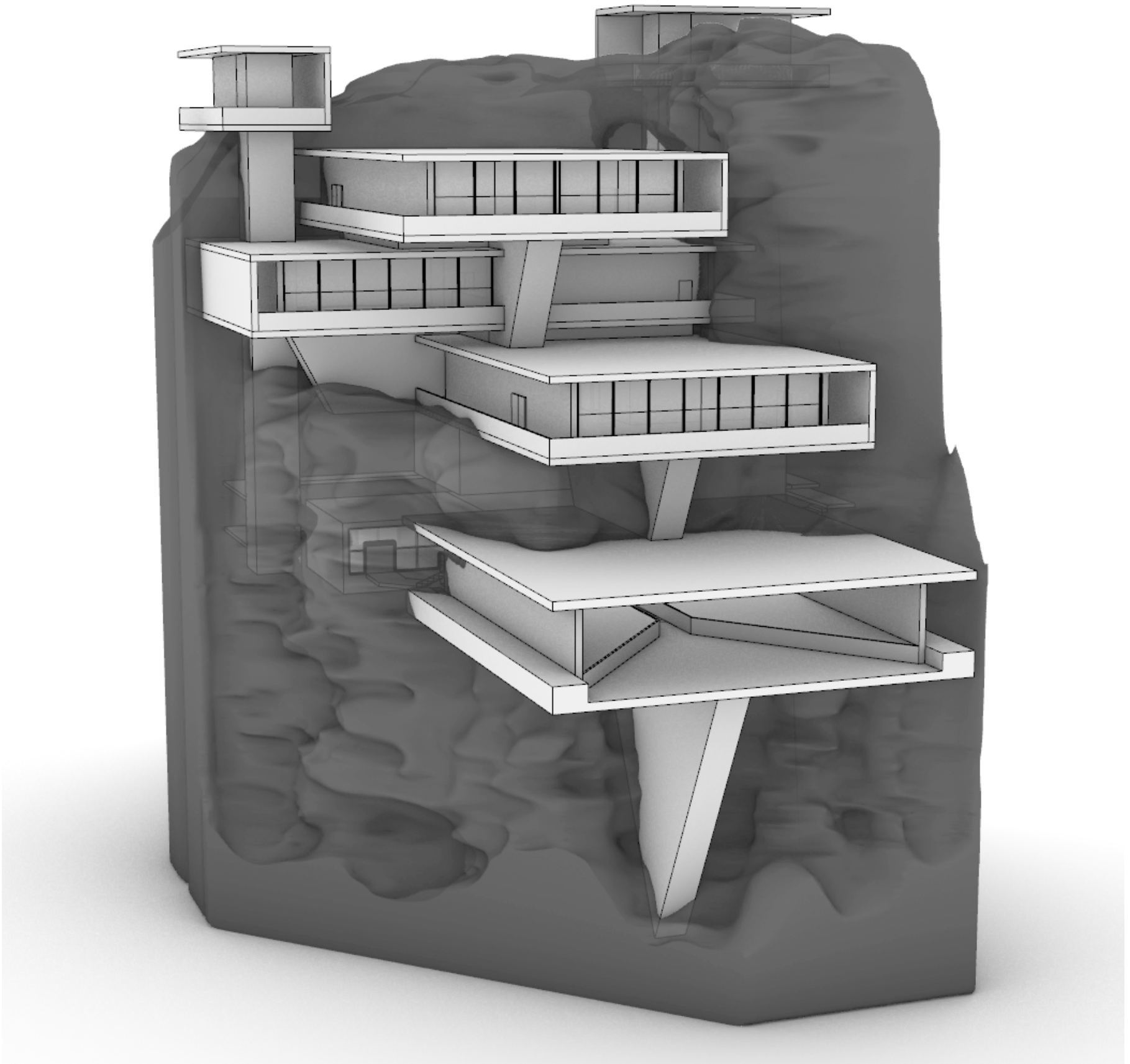
- PLANTS**
- ANIMALS**
- INANIMATE OBJECTS**

Memorial concept diagram

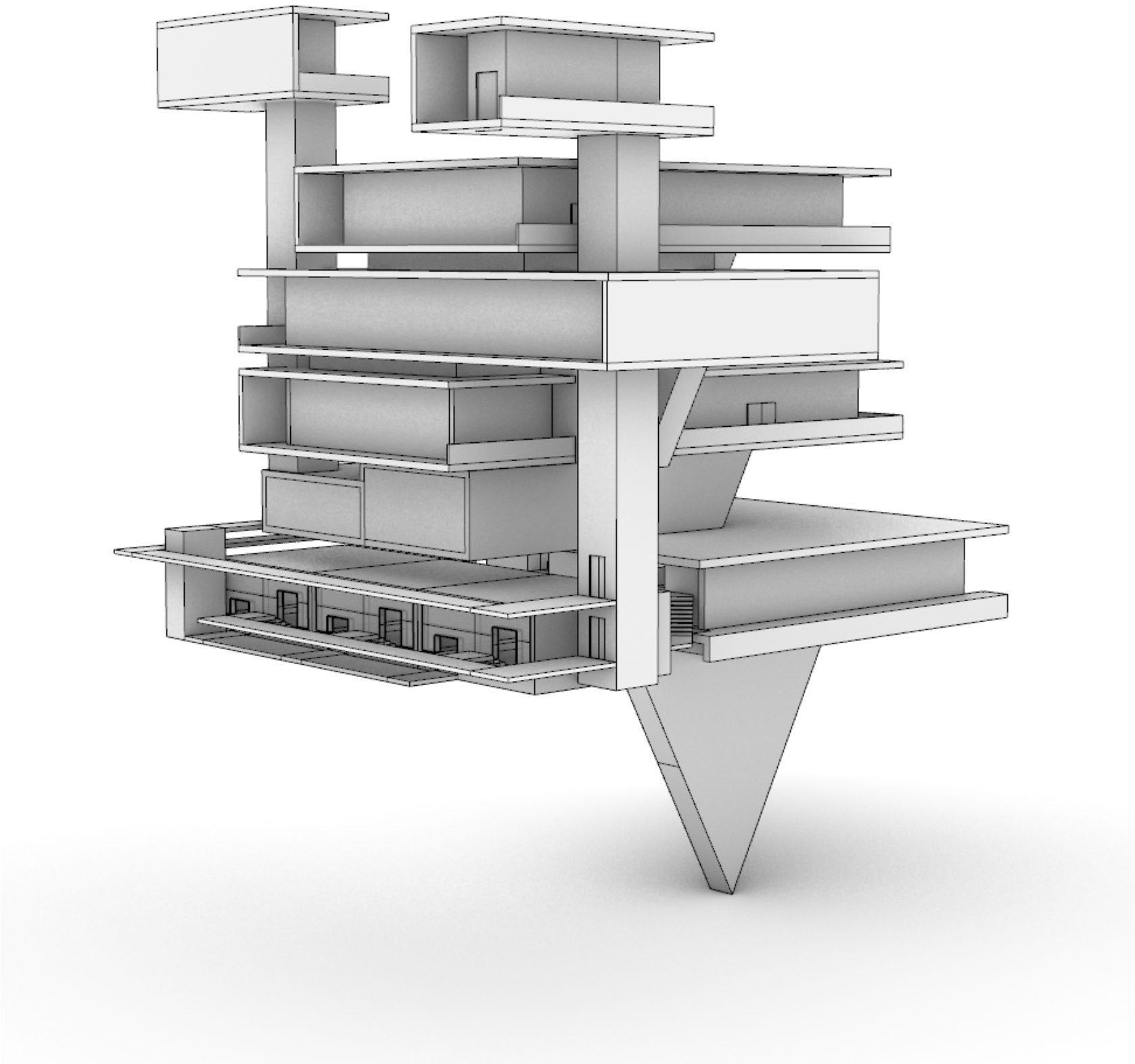
Architectural Development



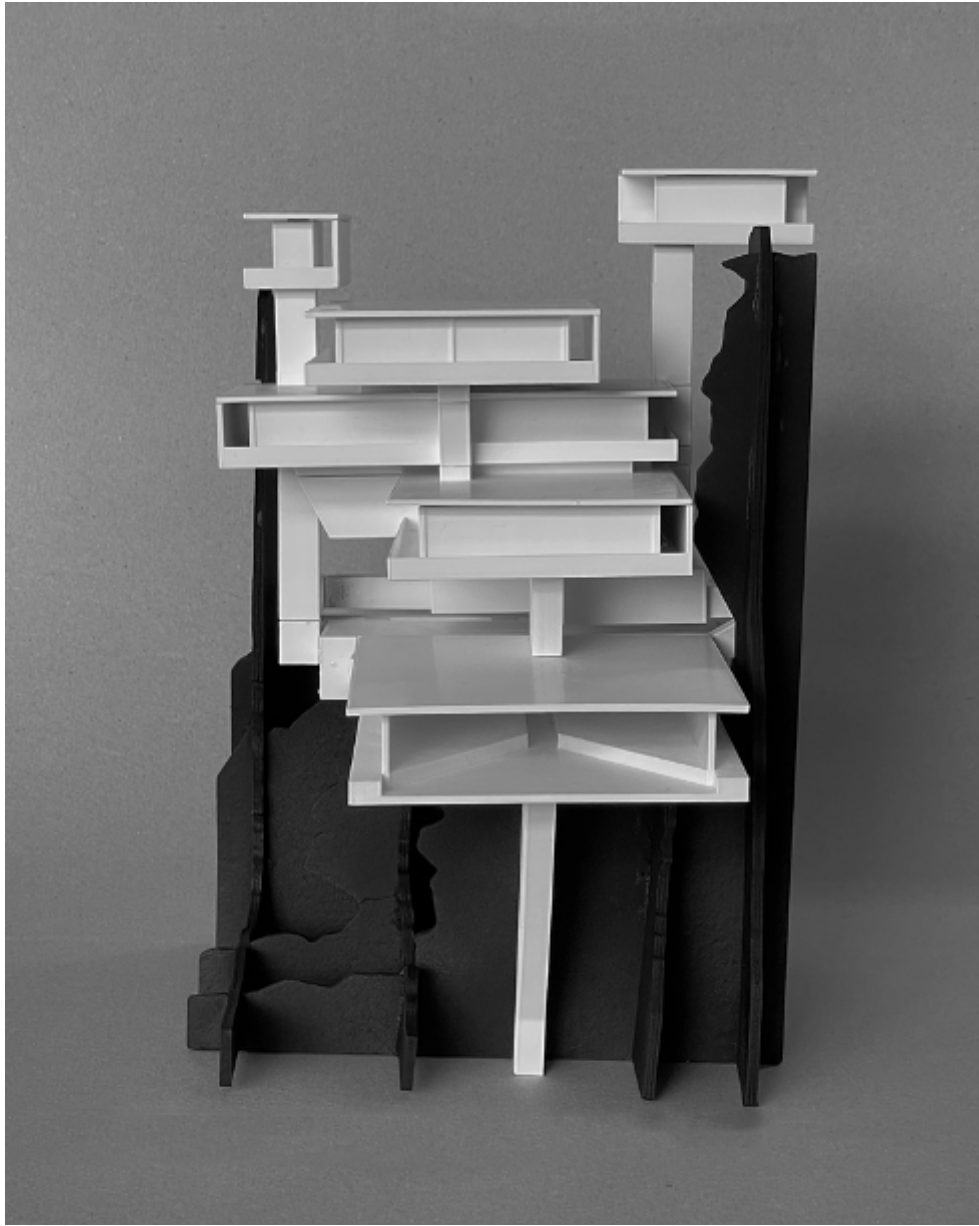
Early massing iterations of architecture



Development of architecture



Development of architecture



Physical model of architectural massing

Architectural Renders and Drawings

SECTION

- 1 - Confluence Rooms
- 2 - Wake Room
- 3 - The Falls
- 4 - Water Storage

SUBLEVEL 1
+61M

SUBLEVEL 2
+52M

SUBLEVEL 3
+43M

SUBLEVEL 4
+25M

SEA LEVEL
+0M



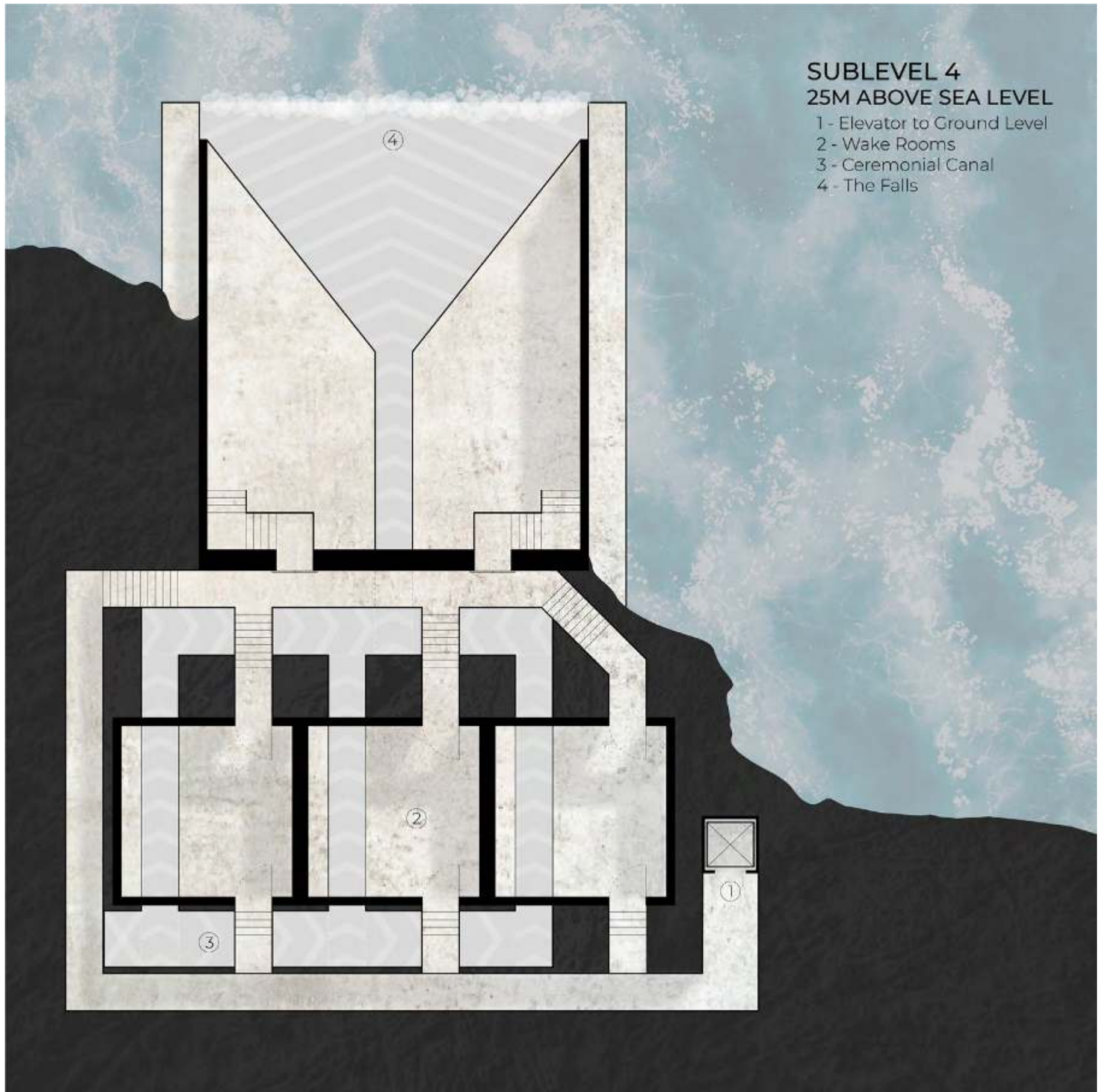
Sectional drawing

**SUBLEVEL 1
61M ABOVE SEA LEVEL**

- 1 - Elevator to Ground Level
- 2 - Upper Levels Elevator
- 3 - Confluence Room
- 4 - Service Elevator



Floorplan (Sublevel 1)



Floorplan (Sublevel 4)



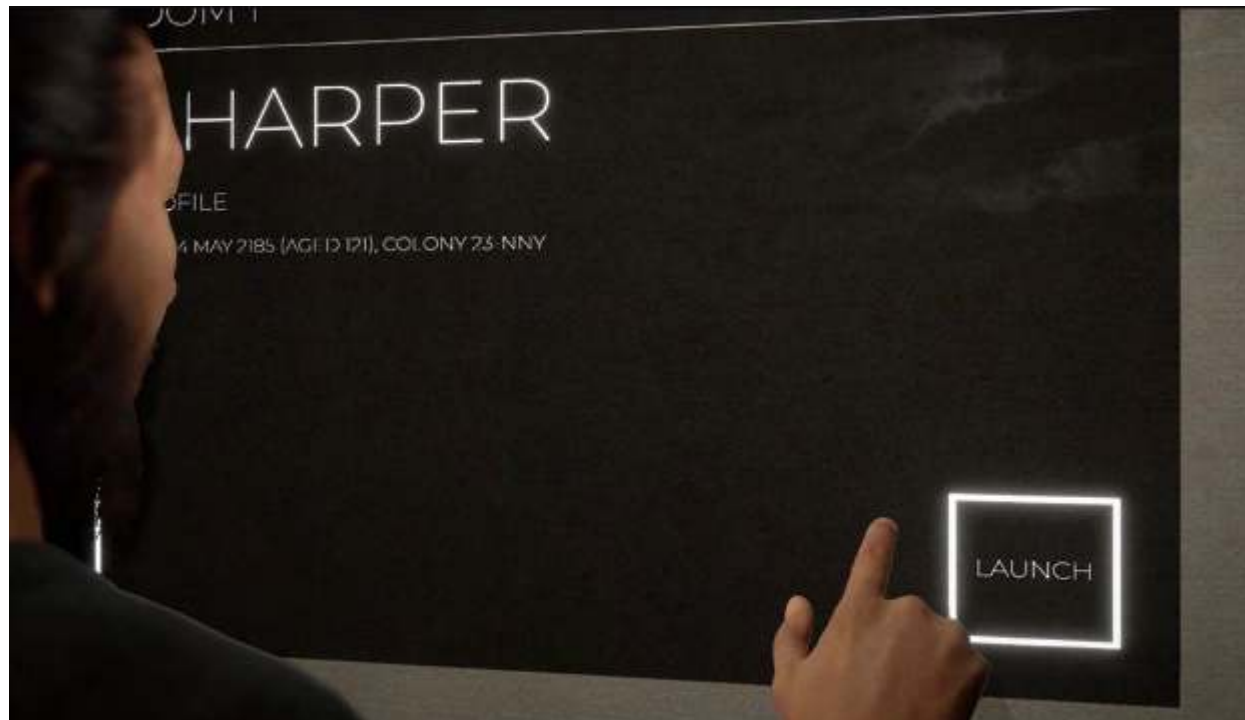
Screenshots of architecture exterior in UE5



Screenshot of interior (Wake room) in UE5



Screenshots of interior (the Falls) in UE5



Screenshots of interior (Confluence room) in UE5

End

Appendix

A - Group Research



Speculative References: Technological Fiction
Ignatius, Sarah, Joy

<Speculative References - Technological Fiction>



<Cryopreservation & Space Burials>

<Speculative References - Technological Fiction>



<Green burials & Organ Reclamation>

<Speculative References - Technological Fiction>



<Memory Archive & Preservation via other Media>

<Speculative References - Technological Fiction>



ALTERED CARBON

CORTICAL STACK

A vertebrae shaped disk inserted at the base of the skull stores the memories, experiences, and personality of its host.

Backup Data
True death only comes if a stack is destroyed. But DHF can be backed up, making even stack destruction irrelevant - for a price

Allen Technology
Recovered alien tech from a distant world makes it possible to digitize a human consciousness

Digital Human Freight
DHF data, the entirety of a human mind, can be stored, recovered, and swapped between bodies

No Real Death
Killing the body is a temporary setback when the cortical stack can easily be placed in a new one in a process called "re-sleeving"

Global Implementation
Every human being is implanted with a cortical stack at age one



<Simulating loved ones & implantation of consciousness>



Speculative References: Environmental Future
Jeremy, Danesh, Hannah, Georgia

<Speculative References: Environmental Future>



- Climate change, temperature rise, lack of freshwater (drying of lakes, melting of glaciers, pollution of groundwater)
- Extreme weather
- Inundation of cities from rising sea level
- human accelerated natural disasters, earthquakes, volcanos, typhon, and tornado
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<Future where current problems are not solved>

<Speculative References: Environmental Future>



- Social Issues Exacerbated
- Limited space dedicated for cemeteries
- Socio-economic divide for after death care
- Places to pay respect to the dead are more vertical due to space constraints



<Effect on society and death>

<Speculative References: Environmental Future>



- Clean energy
- Sustainable lifestyle
- Green and lush urban landscapes
- Technologically advanced
- One unified religion



<Future with green urban environment>

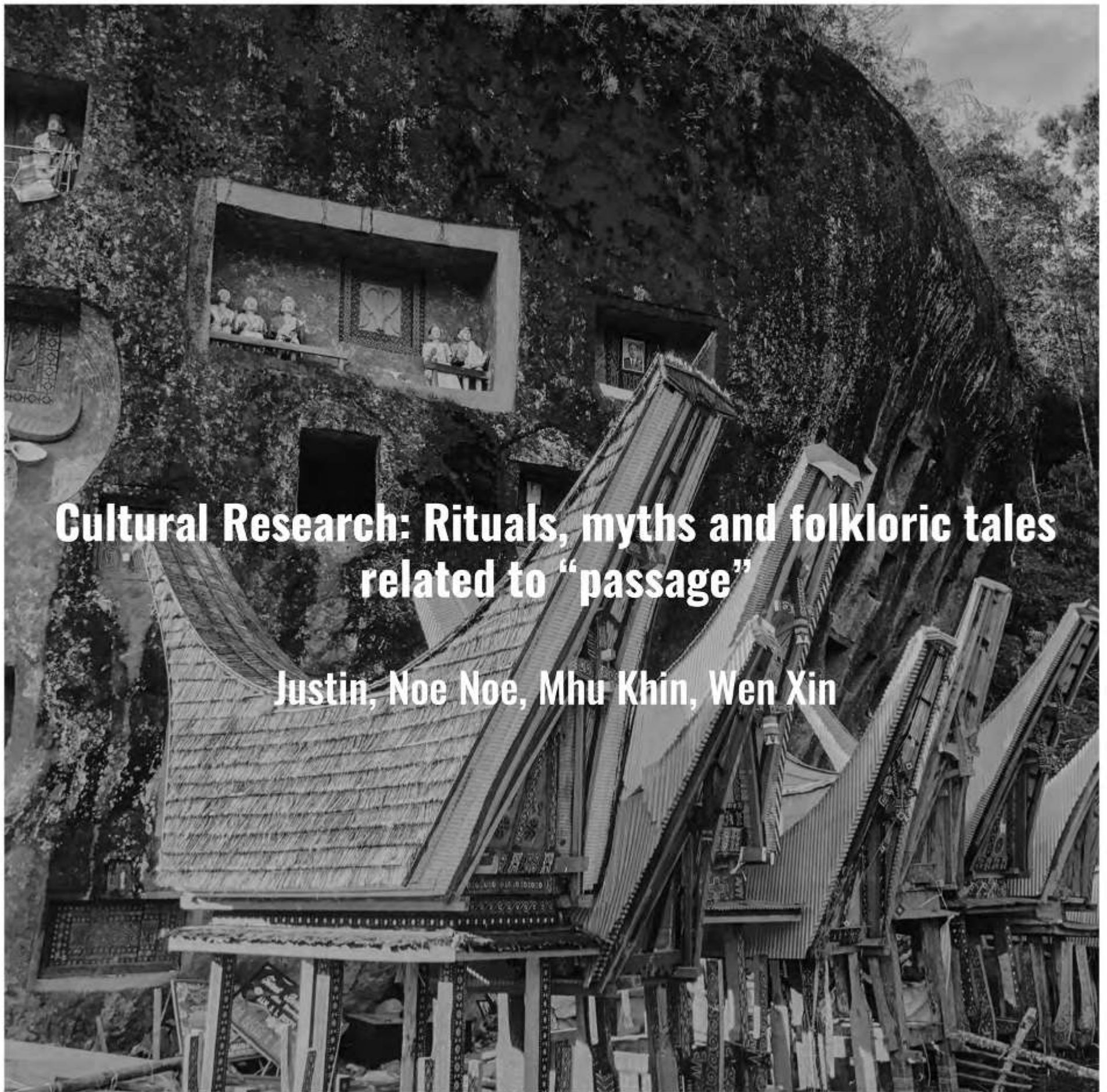
<Speculative References: Environmental Future>



- Cryonics
- Recompose
- Idealized way of laying the dead to rest, respects the dead and the environment



<Effects of encompassing a future with green urban environment>



**Cultural Research: Rituals, myths and folkloric tales
related to “passage”**

Justin, Noe Noe, Mhu Khin, Wen Xin

<Cultural Research: Rituals, myths and folkloric tales>



Day of the dead

- Day when gates of heaven open allowing spirits of deceased to return to reunite with their families
- Mood of celebration, joy expressed through parade, singing and dancing
- Families prepare ofrendas with food their loved ones enjoyed



Aboriginal Mortuary Rituals

- Driving the spirit onward to its next life is crucial
- Smoking in his house
- Feast and celebrate with singing and dancing
- Taboo to speak the deceased's name

<Joyous - Intimate - Large/Small scale>

<Cultural Research: Rituals, myths and folkloric tales>



Toraja Ma'nene Ritual

- Every 1, 2 or 3 years, to honour the dead
- Bodies are dried, cleaned and redressed in new clothes and take pictures with the body
- Relatives parade the bodies around the village
- After their graves are cleaned, return to the original burial site



Hanging Coffins in Sagada

- Tied or nailed to sides of cliffs
- In a foetal position, wrapped in blankets and carried to the cliff site
- Mourners take turn to carry the corpse to be smeared with their blood and fluids
- Young men climb up cliff and place corpse inside hollowed out lumber coffin
- They are hung following the curvature of the cliff to enable the fluid runoff from the coffins to become natural fertilisers

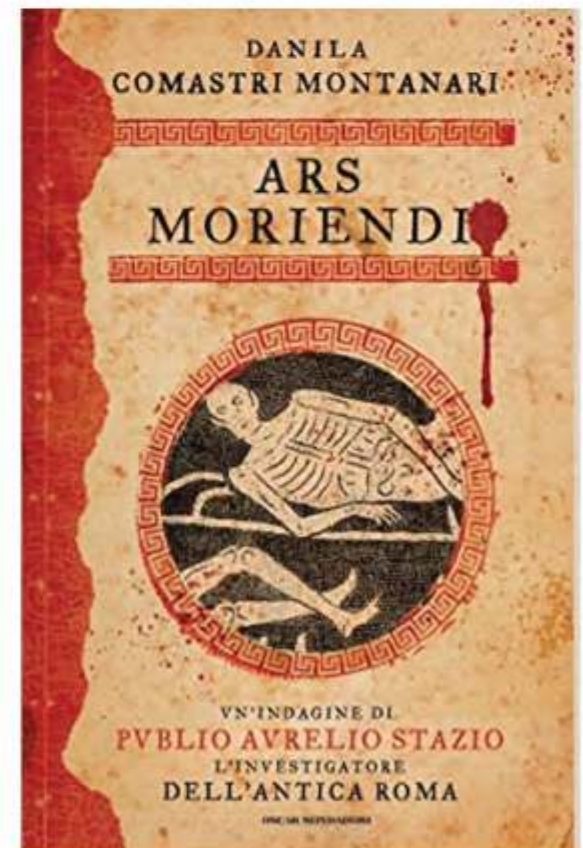
<Grieving - Intimate - Large scale>

<Cultural Research: Rituals, myths and folkloric tales>



House of Bones (Australia)

- Houses 610 painted skulls (from a 12th century graveyard that was cleared)
- Due to a lack of graveyard space, the skulls are painted in the memory of the person
- As the collection of the skull grow, the church began to put the skulls on display, creating walkable rooms to emphasis the religious teaching, creating a *memento mori* (the remainder of inevitable death)



<Grieving - Mass gathering - Large scale>

<Cultural Research: Rituals, myths and folkloric tales>



Tibetan Buddhist Sky Burial

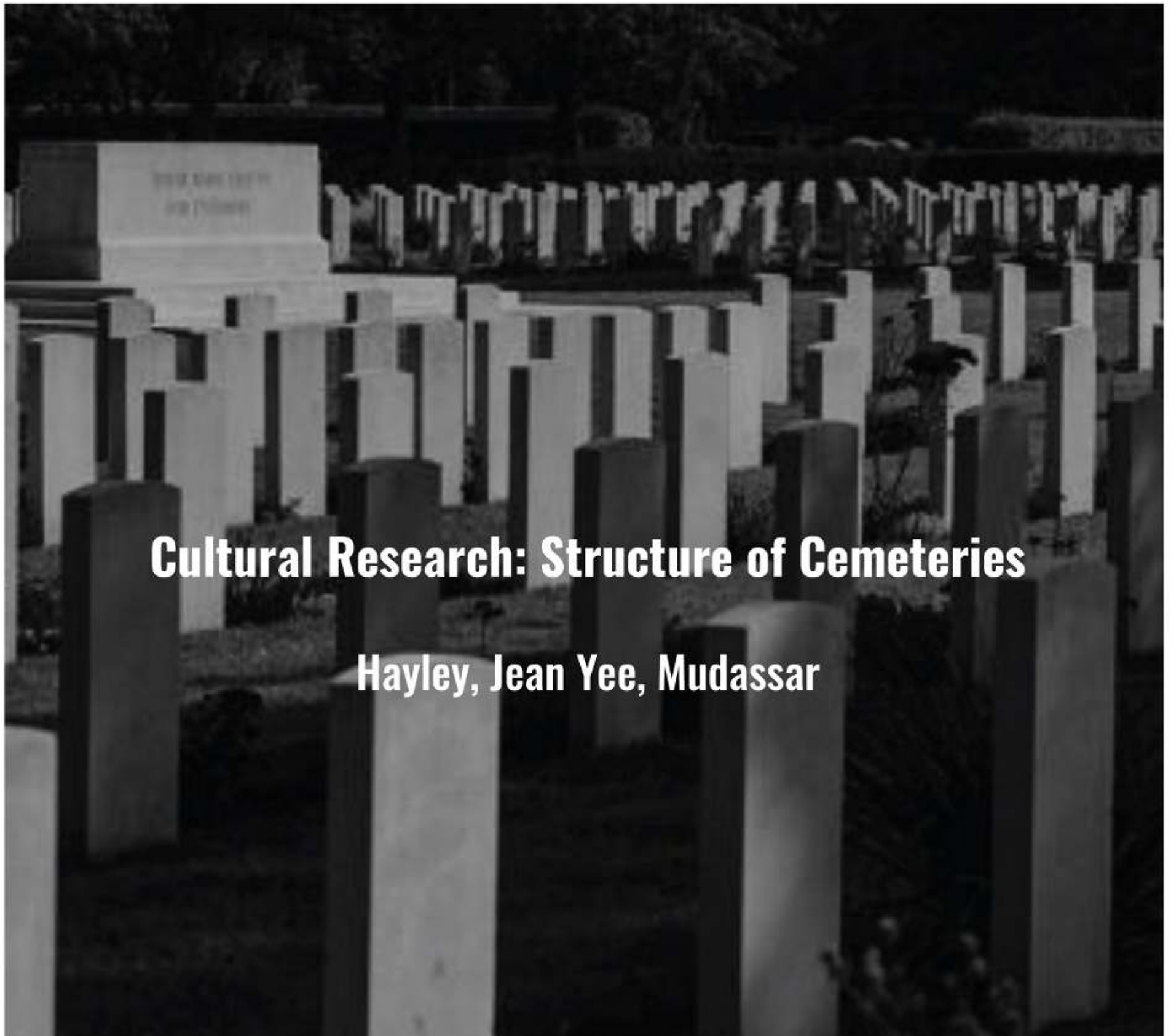
- Corpse is placed to be eaten by vultures
- Body is now an empty vessel
- Act of generosity
- Tibetan Buddhists encouraged to watch the ceremony



Korean Death Beads

- Deceased's ashes made into beads
- Gained popularity after the 2000s
- South Korean implemented a 60-year time limit for graves
- Lack of space
- Held in ornamental containers and plates

<Grieving - Intimate - Small scale>



Cultural Research: Structure of Cemeteries

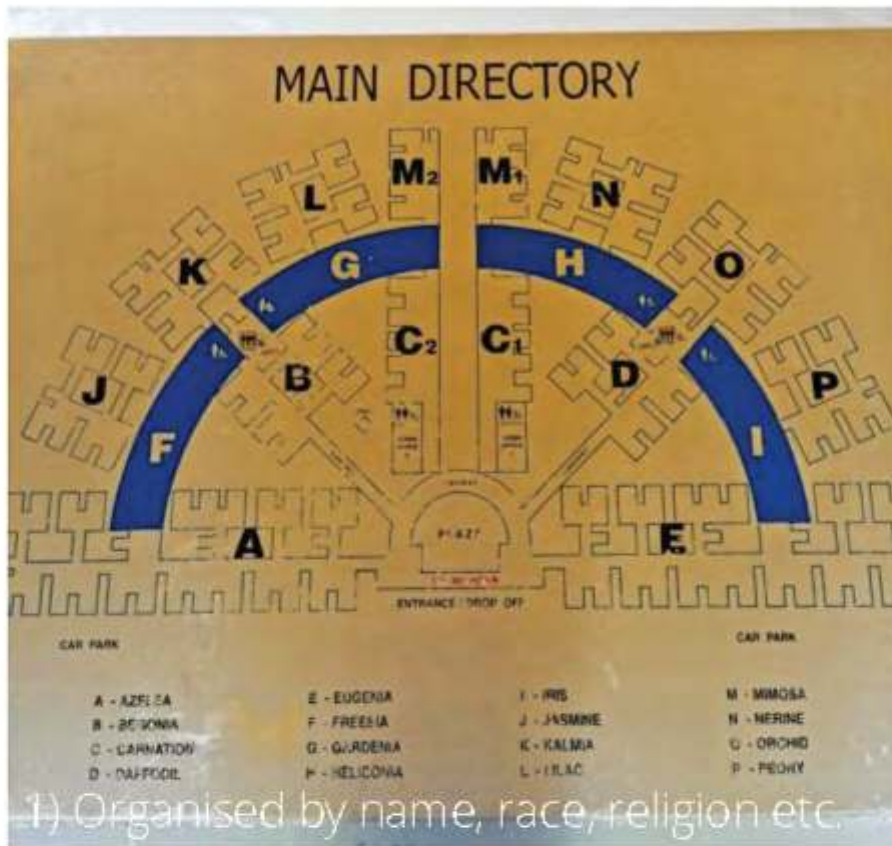
Hayley, Jean Yee, Mudassar

<Cultural Research: Structure of Cemeteries>



<Types of Cemeteries>

<Cultural Research: Structure of Cemeteries>



<Structure of Cemeteries>

<Cultural Research: Structure of Cemeteries>



1) (Unbuilt) Yalin Fu & Ihsuan Lin



2) Memorial Necropole Ecumenica, Brazil



3) Yarkon Cemetery, Israel



4) (Unbuilt) Martin McSherry

<Contemporary Vertical Cemeteries>

<Cultural Research: Structure of Cemeteries>



<Cemetery Programmes>

B - On Memory and Reminiscence by Aristotle

Provided by The Internet Classics Archive. See bottom for copyright. Available online at <http://classics.mit.edu//Aristotle/memory.html>

On Memory and Reminiscence

By Aristotle

Translated by J. I. Beare

Part 1

We have, in the next place, to treat of Memory and Remembering, considering its nature, its cause, and the part of the soul to which this experience, as well as that of Recollecting, belongs. For the persons who possess a retentive memory are not identical with those who excel in power of recollection; indeed, as a rule, slow people have a good memory, whereas those who are quick-witted and clever are better at recollecting.

We must first form a true conception of these objects of memory, a point on which mistakes are often made. Now to remember the future is not possible, but this is an object of opinion or expectation (and indeed there might be actually a science of expectation, like that of divination, in which some believe); nor is there memory of the present, but only sense-perception. For by the latter we know not the future, nor the past, but the present only. But memory relates to the past. No one would say that he remembers the present, when it is present, e.g. a given white object at the moment when he sees it; nor would one say that he remembers an object of scientific contemplation at the moment when he is actually contemplating it, and has it full before his mind;-of the former he would say only that he perceives it, of the latter only that he knows it. But when one has scientific knowledge, or perception, apart from the actualizations of the faculty concerned, he thus 'remembers' (that the angles of a triangle are together equal to two right angles); as to the former, that he learned it, or thought it out for himself, as to the latter, that he heard, or saw, it, or had some such sensible experience of it. For whenever one exercises the faculty of remembering, he must say within himself, 'I formerly heard (or otherwise perceived) this,' or 'I formerly had this thought'.

Memory is, therefore, neither Perception nor Conception, but a state or affection of one of these, conditioned by lapse of time. As already observed, there is no such thing as memory of the present while present, for the present is object only of perception, and the future, of expectation, but the object of memory is the past. All memory, therefore, implies a time elapsed; consequently only those animals which perceive time remember, and the organ whereby they perceive time is also that whereby they

remember.

The subject of 'presentation' has been already considered in our work *On the Soul*. Without a presentation intellectual activity is impossible. For there is in such activity an incidental affection identical with one also incidental in geometrical demonstrations. For in the latter case, though we do not for the purpose of the proof make any use of the fact that the quantity in the triangle (for example, which we have drawn) is determinate, we nevertheless draw it determinate in quantity. So likewise when one exerts the intellect (e.g. on the subject of first principles), although the object may not be quantitative, one envisages it as quantitative, though he thinks it in abstraction from quantity; while, on the other hand, if the object of the intellect is essentially of the class of things that are quantitative, but indeterminate, one envisages it as if it had determinate quantity, though subsequently, in thinking it, he abstracts from its determinateness. Why we cannot exercise the intellect on any object absolutely apart from the continuous, or apply it even to non-temporal things unless in connexion with time, is another question. Now, one must cognize magnitude and motion by means of the same faculty by which one cognizes time (i.e. by that which is also the faculty of memory), and the presentation (involved in such cognition) is an affection of the *sensus communis*; whence this follows, viz. that the cognition of these objects (magnitude, motion time) is effected by the (said *sensus communis*, i.e. the) primary faculty of perception. Accordingly, memory (not merely of sensible, but) even of intellectual objects involves a presentation: hence we may conclude that it belongs to the faculty of intelligence only incidentally, while directly and essentially it belongs to the primary faculty of sense-perception.

Hence not only human beings and the beings which possess opinion or intelligence, but also certain other animals, possess memory. If memory were a function of (pure) intellect, it would not have been as it is an attribute of many of the lower animals, but probably, in that case, no mortal beings would have had memory; since, even as the case stands, it is not an attribute of them all, just because all have not the faculty of perceiving time. Whenever one actually remembers having seen or heard, or learned, something, he includes in this act (as we have already observed) the consciousness of 'formerly'; and the distinction of 'former' and 'latter' is a distinction in time.

Accordingly if asked, of which among the parts of the soul memory is a function, we reply: manifestly of that part to which 'presentation' appertains; and all objects capable of being presented (viz. *aistheta*) are immediately and properly objects of memory, while those (viz. *noeta*) which necessarily involve (but only involve) presentation are objects of memory incidentally.

One might ask how it is possible that though the affection (the presentation) alone is present, and the (related) fact absent, the

latter-that which is not present-is remembered. (The question arises), because it is clear that we must conceive that which is generated through sense-perception in the sentient soul, and in the part of the body which is its seat-viz. that affection the state whereof we call memory-to be some such thing as a picture. The process of movement (sensory stimulation) involved the act of perception stamps in, as it were, a sort of impression of the percept, just as persons do who make an impression with a seal. This explains why, in those who are strongly moved owing to passion, or time of life, no mnemonic impression is formed; just as no impression would be formed if the movement of the seal were to impinge on running water; while there are others in whom, owing to the receiving surface being frayed, as happens to (the stucco on) old (chamber) walls, or owing to the hardness of the receiving surface, the requisite impression is not implanted at all. Hence both very young and very old persons are defective in memory; they are in a state of flux, the former because of their growth, the latter, owing to their decay. In like manner, also, both those who are too quick and those who are too slow have bad memories. The former are too soft, the latter too hard (in the texture of their receiving organs), so that in the case of the former the presented image (though imprinted) does not remain in the soul, while on the latter it is not imprinted at all.

But then, if this truly describes what happens in the genesis of memory, (the question stated above arises:) when one remembers, is it this impressed affection that he remembers, or is it the objective thing from which this was derived? If the former, it would follow that we remember nothing which is absent; if the latter, how is it possible that, though perceiving directly only the impression, we remember that absent thing which we do not perceive? Granted that there is in us something like an impression or picture, why should the perception of the mere impression be memory of something else, instead of being related to this impression alone? For when one actually remembers, this impression is what he contemplates, and this is what he perceives. How then does he remember what is not present? One might as well suppose it possible also to see or hear that which is not present. In reply, we suggest that this very thing is quite conceivable, nay, actually occurs in experience. A picture painted on a panel is at once a picture and a likeness: that is, while one and the same, it is both of these, although the 'being' of both is not the same, and one may contemplate it either as a picture, or as a likeness. Just in the same way we have to conceive that the mnemonic presentation within us is something which by itself is merely an object of contemplation, while, in-relation to something else, it is also a presentation of that other thing. In so far as it is regarded in itself, it is only an object of contemplation, or a presentation; but when considered as relative to something else, e.g. as its likeness, it is also a mnemonic token. Hence, whenever the residual sensory process implied by it is actualized in consciousness, if the soul perceives this in so far as it is something absolute, it appears to occur as a mere thought or presentation; but if the soul perceives it qua related to something else, then,-just as when one contemplates the painting in the picture as being a likeness, and without having (at the moment) seen the actual Koriskos, contemplates it as a likeness of Koriskos, and in that case the experience involved in this contemplation of it (as relative) is different from what one has when he contemplates it simply as a painted figure-(so in the

case of memory we have the analogous difference for), of the objects in the soul, the one (the unrelated object) presents itself simply as a thought, but the other (the related object) just because, as in the painting, it is a likeness, presents itself as a mnemonic token.

We can now understand why it is that sometimes, when we have such processes, based on some former act of perception, occurring in the soul, we do not know whether this really implies our having had perceptions corresponding to them, and we doubt whether the case is or is not one of memory. But occasionally it happens that (while thus doubting) we get a sudden idea and recollect that we heard or saw something formerly. This (occurrence of the 'sudden idea') happens whenever, from contemplating a mental object as absolute, one changes his point of view, and regards it as relative to something else.

The opposite (sc. to the case of those who at first do not recognize their phantasms as mnemonic) also occurs, as happened in the cases of Antipheron of Oreus and others suffering from mental derangement; for they were accustomed to speak of their mere phantasms as facts of their past experience, and as if remembering them. This takes place whenever one contemplates what is not a likeness as if it were a likeness.

Mnemonic exercises aim at preserving one's memory of something by repeatedly reminding him of it; which implies nothing else (on the learner's part) than the frequent contemplation of something (viz. the 'mnemonic', whatever it may be) as a likeness, and not as out of relation.

As regards the question, therefore, what memory or remembering is, it has now been shown that it is the state of a presentation, related as a likeness to that of which it is a presentation; and as to the question of which of the faculties within us memory is a function, (it has been shown) that it is a function of the primary faculty of sense-perception, i.e. of that faculty whereby we perceive time.

Part 2

Next comes the subject of Recollection, in dealing with which we must assume as fundamental the truths elicited above in our introductory discussions. For recollection is not the 'recovery' or 'acquisition' of memory; since at the instant when one at first learns (a fact of science) or experiences (a particular fact of sense), he does not thereby 'recover' a memory, inasmuch as none has preceded, nor does he acquire one ab initio. It is only at the instant when the aforesaid state or affection (of the aisthesis or upolepsis) is implanted in the soul that memory exists, and therefore memory is not itself implanted concurrently with the

continuous implantation of the (original) sensory experience.

Further: at the very individual and concluding instant when first (the sensory experience or scientific knowledge) has been completely implanted, there is then already established in the person affected the (sensory) affection, or the scientific knowledge (if one ought to apply the term 'scientific knowledge' to the (mnemonic) state or affection; and indeed one may well remember, in the 'incidental' sense, some of the things (i.e. ta katholou) which are properly objects of scientific knowledge); but to remember, strictly and properly speaking, is an activity which will not be immanent until the original experience has undergone lapse of time. For one remembers now what one saw or otherwise experienced formerly; the moment of the original experience and the moment of the memory of it are never identical.

Again, (even when time has elapsed, and one can be said really to have acquired memory, this is not necessarily recollection, for firstly) it is obviously possible, without any present act of recollection, to remember as a continued consequence of the original perception or other experience; whereas when (after an interval of obliviscence) one recovers some scientific knowledge which he had before, or some perception, or some other experience, the state of which we above declared to be memory, it is then, and then only, that this recovery may amount to a recollection of any of the things aforesaid. But, (though as observed above, remembering does not necessarily imply recollecting), recollecting always implies remembering, and actualized memory follows (upon the successful act of recollecting).

But secondly, even the assertion that recollection is the reinstatement in consciousness of something which was there before but had disappeared requires qualification. This assertion may be true, but it may also be false; for the same person may twice learn (from some teacher), or twice discover (i.e. excogitate), the same fact. Accordingly, the act of recollecting ought (in its definition) to be distinguished from these acts; i.e. recollecting must imply in those who recollect the presence of some spring over and above that from which they originally learn.

Acts of recollection, as they occur in experience, are due to the fact that one movement has by nature another that succeeds it in regular order.

If this order be necessary, whenever a subject experiences the former of two movements thus connected, it will (invariably) experience the latter; if, however, the order be not necessary, but customary, only in the majority of cases will the subject experience the latter of the two movements. But it is a fact that there are some movements, by a single experience of which persons take the impress of custom more deeply than they do by experiencing others many times; hence upon seeing some

things but once we remember them better than others which we may have been frequently.

Whenever therefore, we are recollecting, we are experiencing certain of the antecedent movements until finally we experience the one after which customarily comes that which we seek. This explains why we hunt up the series (of kineseis) having started in thought either from a present intuition or some other, and from something either similar, or contrary, to what we seek, or else from that which is contiguous with it. Such is the empirical ground of the process of recollection; for the mnemonic movements involved in these starting-points are in some cases identical, in others, again, simultaneous, with those of the idea we seek, while in others they comprise a portion of them, so that the remnant which one experienced after that portion (and which still requires to be excited in memory) is comparatively small.

Thus, then, it is that persons seek to recollect, and thus, too, it is that they recollect even without the effort of seeking to do so, viz. when the movement implied in recollection has supervened on some other which is its condition. For, as a rule, it is when antecedent movements of the classes here described have first been excited, that the particular movement implied in recollection follows. We need not examine a series of which the beginning and end lie far apart, in order to see how (by recollection) we remember; one in which they lie near one another will serve equally well. For it is clear that the method is in each case the same, that is, one hunts up the objective series, without any previous search or previous recollection. For (there is, besides the natural order, viz. the order of the *pralmata*, or events of the primary experience, also a customary order, and) by the effect of custom the mnemonic movements tend to succeed one another in a certain order. Accordingly, therefore, when one wishes to recollect, this is what he will do: he will try to obtain a beginning of movement whose sequel shall be the movement which he desires to reawaken. This explains why attempts at recollection succeed soonest and best when they start from a beginning (of some objective series). For, in order of succession, the mnemonic movements are to one another as the objective facts (from which they are derived). Accordingly, things arranged in a fixed order, like the successive demonstrations in geometry, are easy to remember (or recollect) while badly arranged subjects are remembered with difficulty.

Recollecting differs also in this respect from relearning, that one who recollects will be able, somehow, to move, solely by his own effort, to the term next after the starting-point. When one cannot do this of himself, but only by external assistance, he no longer remembers (i.e. he has totally forgotten, and therefore of course cannot recollect). It often happens that, though a person cannot recollect at the moment, yet by seeking he can do so, and discovers what he seeks. This he succeeds in doing by setting up many movements, until finally he excites one of a kind which will have for its sequel the fact he wishes to recollect. For remembering (which is the *condicio sine qua non* of recollecting) is the existence, potentially, in the mind of a movement capable of stimulating it to the desired movement, and this, as has been said, in such a way that the person should be moved

(prompted to recollection) from within himself, i.e. in consequence of movements wholly contained within himself.

But one must get hold of a starting-point. This explains why it is that persons are supposed to recollect sometimes by starting from mnemonic loci. The cause is that they pass swiftly in thought from one point to another, e.g. from milk to white, from white to mist, and thence to moist, from which one remembers Autumn (the 'season of mists'), if this be the season he is trying to recollect.

It seems true in general that the middle point also among all things is a good mnemonic starting-point from which to reach any of them. For if one does not recollect before, he will do so when he has come to this, or, if not, nothing can help him; as, e.g. if one were to have in mind the numerical series denoted by the symbols A, B, C, D, E, Z, I, H, O. For, if he does not remember what he wants at E, then at E he remembers O; because from E movement in either direction is possible, to D or to Z. But, if it is not for one of these that he is searching, he will remember (what he is searching for) when he has come to C if he is searching for H or I. But if (it is) not (for H or I that he is searching, but for one of the terms that remain), he will remember by going to A, and so in all cases (in which one starts from a middle point). The cause of one's sometimes recollecting and sometimes not, though starting from the same point, is, that from the same starting-point a movement can be made in several directions, as, for instance, from C to I or to D. If, then, the mind has not (when starting from E) moved in an old path (i.e. one in which it moved first having the objective experience, and that, therefore, in which un-'ethized' phusis would have it again move), it tends to move to the more customary; for (the mind having, by chance or otherwise, missed moving in the 'old' way) Custom now assumes the role of Nature. Hence the rapidity with which we recollect what we frequently think about. For as regular sequence of events is in accordance with nature, so, too, regular sequence is observed in the actualization of kinesis (in consciousness), and here frequency tends to produce (the regularity of) nature. And since in the realm of nature occurrences take place which are even contrary to nature, or fortuitous, the same happens a fortiori in the sphere swayed by custom, since in this sphere natural law is not similarly established. Hence it is that (from the same starting-point) the mind receives an impulse to move sometimes in the required direction, and at other times otherwise, (doing the latter) particularly when something else somehow deflects the mind from the right direction and attracts it to itself. This last consideration explains too how it happens that, when we want to remember a name, we remember one somewhat like it, indeed, but blunder in reference to (i.e. in pronouncing) the one we intended.

Thus, then, recollection takes place. But the point of capital importance is that (for the purpose of recollection) one should cognize, determinately or indeterminately, the time-relation (of that which he wishes to recollect). There is,-let it be taken as a fact,-something by which one distinguishes a greater and a smaller time; and

it is reasonable to think that one does this in a way analogous to that in which one discerns (spacial) magnitudes. For it is not by the mind's reaching out towards them, as some say a visual ray from the eye does (in seeing), that one thinks of large things at a distance in space (for even if they are not there, one may similarly think them); but one does so by a proportionate mental movement. For there are in the mind the like figures and movements (i.e. 'like' to those of objects and events). Therefore, when one thinks the greater objects, in what will his thinking those differ from his thinking the smaller? (In nothing,) because all the internal though smaller are as it were proportional to the external. Now, as we may assume within a person something proportional to the forms (of distant magnitudes), so, too, we may doubtless assume also something else proportional to their distances. As, therefore, if one has (psychically) the movement in AB, Be, he constructs in thought (i.e. knows objectively) GD, since AG and Gd bear equal ratios respectively (to AB and BE), (so he who recollects also proceeds). Why then does he construct GD rather than Zh? Is it not because as AG is to AB, so is O to I? These movements therefore (sc. in AB, BE, and in O:I) he has simultaneously. But if he wishes to construct to thought ZH, he has in mind BE in like manner as before (when constructing GD), but now, instead of (the movements of the ratio) O:I, he has in mind (those of the ratio K:L; for K:L::ZA:BA. (See diagram.)

When, therefore, the 'movement' corresponding to the object and that corresponding to its time concur, then one actually remembers. If one supposes (himself to move in these different but concurrent ways) without really doing so, he supposes himself to remember.

For one may be mistaken, and think that he remembers when he really does not. But it is not possible, conversely, that when one actually remembers he should not suppose himself to remember, but should remember unconsciously. For remembering, as we have conceived it, essentially implies consciousness of itself. If, however, the movement corresponding to the objective fact takes place without that corresponding to the time, or, if the latter takes place without the former, one does not remember.

The movement answering to the time is of two kinds. Sometimes in remembering a fact one has no determinate time-notion of it, no such notion as that e.g. he did something or other on the day before yesterday; while in other cases he has a determinate notion-of the time. Still, even though one does not remember with actual determination of the time, he genuinely remembers, none the less. Persons are wont to say that they remember (something), but yet do not know when (it occurred, as happens) whenever they do not know determinately the exact length of time implied in the 'when'.

It has been already stated that those who have a good memory are not identical with those who are quick at recollecting. But the act of recollecting differs from that of remembering, not only chronologically, but also in this, that many also of the other animals (as

well as man) have memory, but, of all that we are acquainted with, none, we venture to say, except man, shares in the faculty of recollection. The cause of this is that recollection is, as it were a mode of inference. For he who endeavours to recollect infers that he formerly saw, or heard, or had some such experience, and the process (by which he succeeds in recollecting) is, as it were, a sort of investigation. But to investigate in this way belongs naturally to those animals alone which are also endowed with the faculty of deliberation; (which proves what was said above), for deliberation is a form of inference.

That the affection is corporeal, i.e. that recollection is a searching for an 'image' in a corporeal substrate, is proved by the fact that in some persons, when, despite the most strenuous application of thought, they have been unable to recollect, it (viz. the anamnesis = the effort at recollection) excites a feeling of discomfort, which, even though they abandon the effort at recollection, persists in them none the less; and especially in persons of melancholic temperament. For these are most powerfully moved by presentations. The reason why the effort of recollection is not under the control of their will is that, as those who throw a stone cannot stop it at their will when thrown, so he who tries to recollect and 'hunts' (after an idea) sets up a process in a material part, (that) in which resides the affection. Those who have moisture around that part which is the centre of sense-perception suffer most discomfort of this kind. For when once the moisture has been set in motion it is not easily brought to rest, until the idea which was sought for has again presented itself, and thus the movement has found a straight course. For a similar reason bursts of anger or fits of terror, when once they have excited such motions, are not at once allayed, even though the angry or terrified persons (by efforts of will) set up counter motions, but the passions continue to move them on, in the same direction as at first, in opposition to such counter motions. The affection resembles also that in the case of words, tunes, or sayings, whenever one of them has become inveterate on the lips. People give them up and resolve to avoid them; yet again they find themselves humming the forbidden air, or using the prohibited word. Those whose upper parts are abnormally large, as is the case with dwarfs, have abnormally weak memory, as compared with their opposites, because of the great weight which they have resting upon the organ of perception, and because their mnemonic movements are, from the very first, not able to keep true to a course, but are dispersed, and because, in the effort at recollection, these movements do not easily find a direct onward path. Infants and very old persons have bad memories, owing to the amount of movement going on within them; for the latter are in process of rapid decay, the former in process of vigorous growth; and we may add that children, until considerably advanced in years, are dwarf-like in their bodily structure. Such then is our theory as regards memory and remembering their nature, and the particular organ of the soul by which animals remember; also as regards recollection, its formal definition, and the manner and causes-of its performance.

THE END

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