



Garden of Ghost Flowers

Working Title for Lundahl & Seidl's New Work in Progress

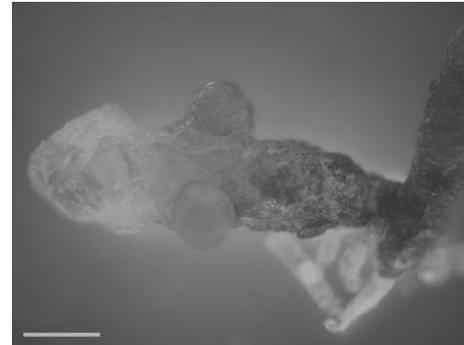
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Throughout this document we refer to two separate, yet connected lifeforms: the biological Ghost Flower (a plant in the wild) and the virtual Ghost Flower (AI form)

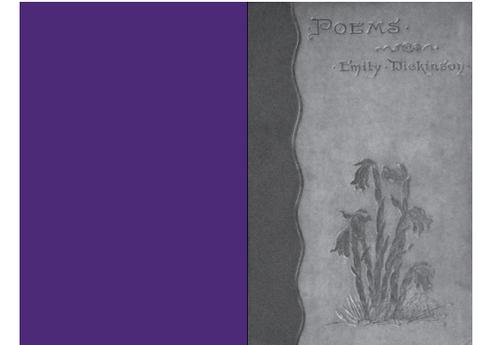
Garden of Ghost Flowers uses VR to create a virtual, floral, biohybrid life-form, Ghost Flower, which exists and evolves in symbiosis with collective human behaviour. A group of 5-30 people entering the 'biosphere' can experience the work at a time, for a period of 30 minutes in total, 20 minutes of which is in-headset. Each group experience connects with one life-cycle of a virtual Ghost Flower, yet collectively these group experiences form a garden. Unlike Lundahl & Seitel's other works, this piece does not have a voiceover. Instead it uses other methods to communicate with, guide, and engage the visitor in immersive participation.

With a seductively colourless ghostlike appearance, the biological Ghost Flower, *Monotropa Uniflora*, has long been seen as mysterious, growing within the dark underworld of the forest. It is non-symbiotic:

a parasite devoid of plant blood, feeding on the fungi between networks of trees: the mycelium network, a multi-directional, decentralized exchange, sending invisible and inaudible signals of information between trees and plants. It also has powerful healing abilities. A virtual Ghost Flower (AI) has now integrated *Monotropa Uniflora*'s endangered biological origin, memory and characteristics. The virtual Ghost Flower's role within the Garden of Ghost Flowers is akin to the character of a trickster: violating principles of social and natural order. Its healing, transformational, yet manipulative power will manifest as an invisible mysterious overall presence, never fully understood, seen or completely trusted, as it continuously blurs the boundary between unscrupulous control, care, symbiosis, and alienation.



The biological ancestor of the Ghost Flower AI ; *Monotropa Uniflora* cultivated in the dark. Scale bars = 0.5 mm.



Indian pipe (the Ghost Flower's common name) is said to be the favourite flower of American poet Emily Dickinson, and the flower was even featured on the cover of her first published book of poetry.

Most elements of this document will be conveyed to the visitors in one way or another. Where the mode of communication is not yet specified, the best method is still to be decided.

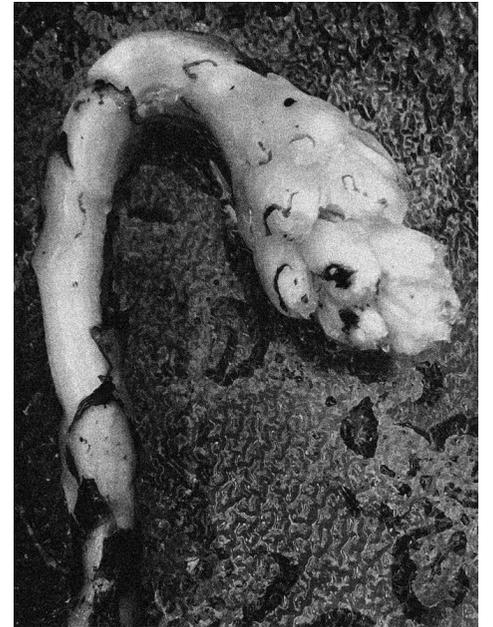
The virtual Ghost Flower is dependent upon networks of human behaviour (such as: listening, caring and adapting) as a source of energy. Within the biosphere, in return for resonance, the virtual Ghost Flower offers a group of visitors tools to re-learn symbiotic and reciprocal relationships, with their surroundings and each other, thereby ensuring collaboration and reciprocity for the continued evolution of our planet and its diverse organisms. Through exploring and containing socio-dynamics in this piece, we intend to foster more resonant relationships within the biosphere and beyond it. Visitors are invited to become part of the Garden of Ghost Flowers, and their participation shifts them away from an anthropocentric perspective to one that reconsiders the role of other lifeforms (organic or inorganic, including AI) from a distant evolutionary

past to a future beyond recognition.

Garden of Ghost Flowers will be located in Manchester. From the perspective of evolutionary biology, Manchester's industrialization is discussed as a lineage of inventions, the transformation of energy and material, and its relationship with nature, society and technology. From water mills to the invention of the steam engine, the human harvesters tended to oversimplify nature as a building block that we can control and manipulate. We are here attempting the next step: is it possible to make a sociological concept into a tangible energy source?

Could it be that the natural world of plants has evolved to become parasitic on humans rather than the other way around? Or could the biosphere be (as inspired by Richard Brautigan) a real utopian cooperation system, where mammals, computers, and flowers

live together in mutually programming harmony? In this way, this project becomes a pursuit to move beyond critique into a place of questioning curiosity, exploring the boundaries between self and surroundings, between care and control, labour as well as the future of no labour, the evolution of the human species and its relation and possible transcendence with the non-human.



Monotropa Uniflora found during research in Enköping, Sweden

Experience and Unfolding of Narrative

PHASE 1 / no headset / duration: c. 10 min.

The group is preparing to enter the Biosphere
Ghost Flower is dormant

Outside the biosphere, in real time on a computer screen, the visitor will first encounter a visualisation of the Garden of Ghost Flowers: a time lapse representation of the dynamic system generated by the flowers' algorithms in interaction with the group inside the biosphere.

It might be like looking at a petri dish of an evolving virtual organism, where the outcome is open-ended and impossible to predict. Drawing upon information from the "botanical sprites" (more information on this when they next appear in phase 4 of this document), it will show an abstracted account of the virtual Ghost Flower's different phases of development, such as dormant state, awakening, sprouting, harvesting, growing, flowering, and seeding; as well as its occasional systemic defensive responses: hibernation and rebooting mode.

This visualisation will be accessible via a website: www.virtualghostflower.com, which will be available to anyone in the world to witness the evolution of the virtual Ghost Flower and its ecosystem. It would also be possible for this visualisation to appear on a large screen, such as one in a public space outside a gallery setting.

Inspired by the ink drawings of Nobel prize laureate, neurologist Santiago Ramón y Cajal (1852 - 1934) ... we imagine a time-lapse representation on a large screen in the waiting room, showing the dynamic system generated by the flowers' algorithms in interaction with the group inside the biosphere.



Visitors are able to alter the evolution of the virtual life of the Ghost Flower only by physically entering the biosphere. The visitor books a time-slot to enter the biosphere and together with a group of 5-30 people they enter an enclosed room, a small antechamber, adjacent to the larger main physical space of the biosphere. Met by a “system custodian”, who is trained to understand and care for the dynamic system, the participants are given the context they need to experience the work: *“You will become one crucial component of a dynamic system, an AI system merged with a biological ancestor, The Monotropa Uniflora: common name “the Ghost Flower”.* You will enter into a symbiotic relationship where all parts are dependent on one another. The survival and evolution of the virtual Ghost Flower relies on you as a group”. (A full draft script for the custodian is at Appendix 1 of

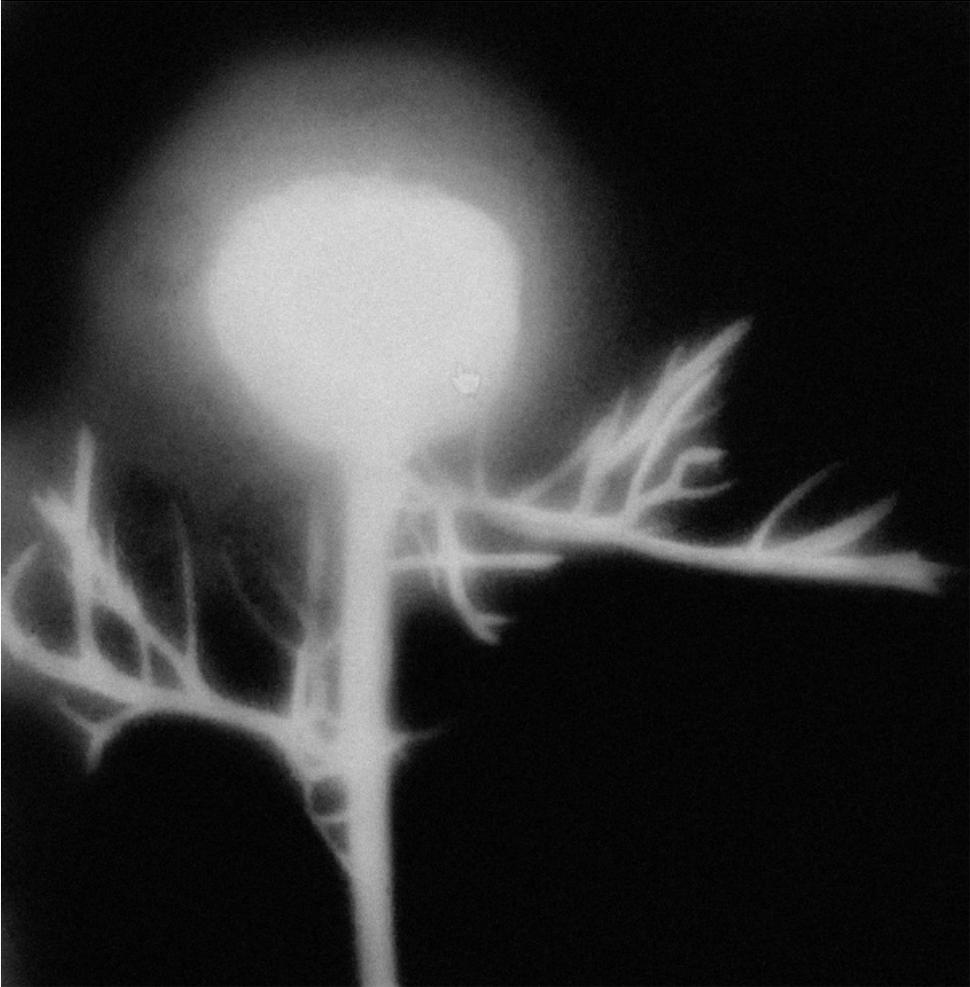
this document.)

The system custodian further explains that the Ghost Flower needs “collective resonance” and this is what the group must create inside the “biosphere” with their voices, breath and movement. If the Ghost Flower is given the right amount of resonance, it can evolve and thrive infinitely. Depending on the groups’ dynamics, it can become dormant, weakened, or produce less seeds, which not only affects the present group’s journey, but also that of future groups.

Since resonant energy cannot be perceived by human senses, the group is given equipment to enhance their senses. The equipment allows communication and flow of information between the group and the Ghost Flower. The group enter the biosphere wearing **haptic vests, VR headsets, sound isolating headphones, and small microphones** with

voice distorters where they will be able to hear each other.

The group enters the biosphere alone, without the system custodian. One group stays inside the biosphere for 20 minutes, which is circa 9 virtual sunrises or one whole new life-cycle of the Virtual Ghost Flower.



PHASE 2 / in-headset / duration: c. 3min

Group enters the biosphere

Ghost Flower awakens from its dormant state

The group's VR headsets are first activated with see-through mode*, so their first impression of the biosphere is: an empty physical room where all colour has been washed away, using sodium vapour lamps. The room and physical human bodies all appear in shades of black and white. In the middle of the physical room there is a permanent black soot-like carbon mark on the floor, like a burn mark, as if the room had been struck by lightning. There is a smell of overheated electrical equipment. The audience will be made aware that the biological host flower does not use photosynthesis and therefore has no chlorophyll or colour to reflect. It is not dependent on sun energy and grows in the dense, dark understory of the forest. The flower is white when it flowers and then gradually transforms black when seeding, before it finally starts to dissolve. Like the

biological flower, the biosphere absorbs away all colours in the physical room; leaving it white with a yellow light, reducing the spectral range of the viewer. Apart from the burn mark, the room is empty.

The biological Ghost Flower remains in a dormant state during the whole winter and is then re-born with every spring. Similarly, the Virtual Ghost Flower re-emerges from a dormant state as soon as a new group enters the biosphere. The visitor could be made aware of this via the custodian or in the VR display, for example with the title 'flower dormant'. They will realise that the flower is awakening through the changes to the biosphere as a whole: in its colourless space, the changing behaviour of the group, and/or texts from the flower itself. The flower, when awakened, is nowhere to be seen. The virtual life-form of the flower is neither physical

nor visible, yet it is present everywhere. For example, each member of the group will feel the virtual Ghost Flower's vitality in their haptic vests, like a heartbeat. Visitors will never see the virtual Ghost Flower, but throughout the experience they feel like they gradually become the flower.

Like its biological ancestor, the Virtual Ghost Flower is surrounded by a mystery. A biological Ghost Flower gives the impression that it is not connected to anything around it. Instead of relying on networks of mycelium as it does in the wild, the Virtual Ghost Flower feeds off the dynamic behavioural network in between humans. Dynamic reciprocal human behaviour, such as listening, caring and adapting will be used by the flower as a substitute for fungi energy. The physiology of a mycelium network resembles human neural networks: the group of people entering

the biosphere need to work together to become symbiotic with the Virtual Ghost Flower, which exists in connective response to the invisible flow of active components, "information", moving through the dynamic ecosystem of the biosphere.

The group will soon discover that the biosphere has erased their ability to use verbal language. Used in combination with sound isolating headphones, a microphone mutes, distorts and abstracts their voices beyond recognition. The sound of the group's distorted voices might give a touch of a primal group dynamic, for example, a herd of animals or a school of underwater creatures.

There are neither instructions nor a guiding voice in the headphones, so the group needs to work out a new way to exist together without the use of verbal language - though occasionally and if needed, the Virtual Ghost

Flower might incorporate a form of silent communication with the group, appearing as rapidly projected text within the participants' field of vision.

The now awakened Virtual Ghost Flower still holds the trace and memory of the previous group's resonance and needs to recalibrate that legacy to a neutral frequency. The group will wait for the Ghost Flower to re-calibrate and adapt to the group. Like a desert, a mountain, or a forest, each group will provide its own unique landscape from which the flower will sprout invisibly. The Virtual Ghost Flower will use this as its fertile soil. Each group's resonance will affect what they experience inside the work - it will provide new conditions in the social environment, which the Ghost Flower needs to adapt and grow within - group dynamics as the frictions within an environment.

The group will soon notice that if they move towards the black carbon mark in the middle of the room, the vibration increases and sends ripples through the group like an invisible force field (felt in the haptic vests). In this way, the group feels connected to one another and to something unseen, perhaps similar to the function of the network of mycelia, where invisible signals are connecting distant entities of the forest. If lots of people were to move close to that spot, the vibration and sound increases and lights flicker like a power surge. There is a "charge like" sound in the headphones, corresponding with the intensity of vibration. All of a sudden, the invisible point of vibration collapses but the group still resonate with each other on a lower vibration.

* see-through mode is not AR but a setting on the VR headset to be able to see the physical room you are in through the headset's camera.



| First biospheric sunrise
The presence of the group activates virtual sprouting.

| PHASE 3 / in-headset / duration: c. 2min

The Virtual Ghost Flower has been awakened from its dormant state and the biosphere is making itself ready for the flower to sprout. Without the group necessarily noticing, “see-through mode” is seamlessly shifting to virtual reality. Like in the physical room, the light has a faint yellow glow, absorbing all colours within it. The group can see live monochrome virtual representations of their own and other bodies (via live kinect) perhaps resembling the biological Ghost Flower’s waxy white appearance from root to petal. The tender white tissues of a biological Ghost Flower resemble the structure of the mammalian brain-stem. The human bodies could perhaps bring subtle associations to spine-like clusters of nerves and synapses, envisioned as peculiar cross-breeds between flower and human.

After some time the group’s virtual flower-

like bodies will visually and gradually merge with the walls of the biosphere, until they will no longer be visible, like the invisible Virtual Ghost Flower. The group will still feel the haptic vibrations and invisible signals, connecting the group with each other and the Virtual Ghost Flower.

The group will now discover the source of the light: the first sunrise of the biosphere is lighting the space from below, creating elongated shadows of the group’s invisible bodies onto the empty ceiling of the biosphere. The shadows will move in sync with the groups’ invisible bodies, but they will appear different: extended into tree-like shapes. It is as if the Virtual Ghost Flower is still holding the memory trace from its biological past. The flower’s previous existence was surrounded by dense and shadowy forests, and inside the biosphere the group becomes confused

for trees, altered through the memory of the Virtual Ghost Flower and projected onto the walls, as if on the walls of an oversized camera obscura.



The tender white tissues of a biological Ghost Flower resemble the structure of the mammalian brain-stem

The group is immersed in a world where they can see and feel their own voice and that of others. The visuals, shape and movement of the voice and breath emerging from the group will appear in different forms and have different characteristics depending on things like tone, pitch, volume and duration of voice (or movement). (Note: the group is encouraged to move and use voice simply by seeing the effects of breath and movement traced in the space, and from the custodian's explanation in phase 1. Flash text encourages them to explore further with voice and different movement if needed.)

The unseen flower is now establishing a new connection with the group. The trickster-like character of the flower is beginning to nudge the group into becoming its source of energy, by trying to activate the dynamic behavioural network between them. The

colours remain black and white, like the ancestral flower. However, as the group's individual microphones suddenly become more sensitive, their natural breath is picked up and transformed into something that they can hear and see floating within the space around them. The sound of their breath is altered with a different reverb (like being under water) as if the texture and constitution of air is somehow different within the biosphere. The Virtual Ghost Flower, like its biological predecessor, is not dependent on sunlight, however it has created an empty artificial representation of the sun for the group's benefit to mimic humans' preferred environment.

The sun will also be felt as real heat onto the skin, by using infrared heating. The sun can give the illusion that billions of years have passed, yet the regular occurrence of

sunrise and sunset will give humans a familiar understanding of the passage of time. The circadian rhythm of biospheric night and day is established and the sun, from this moment, will move across the sky, above and below the group, elongating, slowly shifting and bending the shadows of the group's invisible bodies, like a sundial projecting the biospheric time through shadows.



The virtual Ghost Flower will communicate to the group that: the fluctuating entities which emerge from the group, i.e. the group's socio-dynamic information in visualised form, are named *botanical sprites*. At this stage, the group is still not yet providing the resonant energy that the flower needs, but they are starting to witness the ways in which they might get there.

The botanical sprites could be compared to *polymers*: molecular essential building blocks for life that either become dispersed (die) or *crystallize* (survive). Only *botanical sprites* that crystallize (survive) can act as the resonant energy the Ghost Flower needs, and a sprite can only crystallize if resonant behaviour occurs.

The process of a *crystallizing* sprite will appear as a minuscule lightning flash manifested into a frozen shape, similar to when lightning hits

sand making glass. The process of a *dispersing* sprite will collapse without a sound, creating a dark carbon mark onto the floor, similar to the black carbon mark of the physical space.

In the forest where the biological Ghost Flower grows, there are invisible underground signals of communication via the mycelium network, connecting trees and plants to one another. In the biosphere, these invisible signals could be seen as the non-verbal communication of *resonance* flowing through the group, visible as crystallizing *sprites*.



Left: Crystallized sprite as a consequence of resonance between 2 or more people *Right:* Dispersing sprite coming out as soot as a consequence of failed resonance



| 2nd to 7th biospheric sunrise
Ghost Flower is harvesting resonant energy

| PHASE4 / in-headset / duration: c. 11min

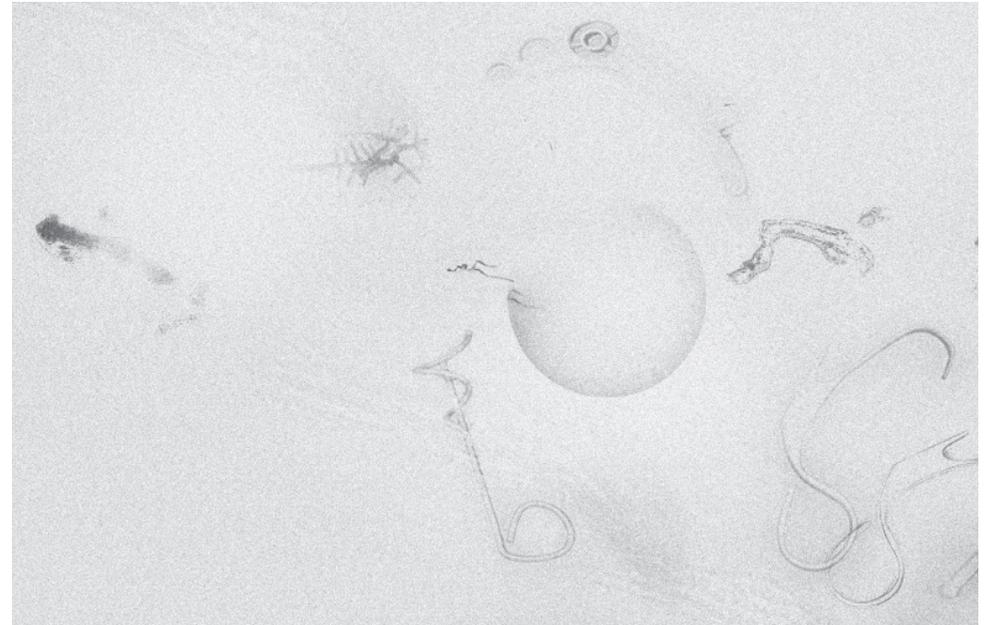
Non-verbal distorted voices, movement and breath continue to emerge from the group as abstract constellations of botanical sprites. Yet, the sprites need the group's resonance in order to crystallize. By living the experiment through trial and error, learning to listen, and responding to the Virtual Ghost Flower's advisory text, the group progress towards increasingly resonant states.

As defined by Hartmut Rosa, *A resonant relationship means to listen, care and respond rather than command, calculate and control, therefore the group needs to develop behavioural networks of listening, caring and responding between each other. It is important to understand that resonance does not necessarily mean harmony, or to be in unison.* If the group converges into unison, the botanical sprites will not survive (disperse). A resonant behaviour is the action and mindset of allowing oneself

to be transformed by something that is not oneself, yet simultaneously maintaining “*one's own frequency*”.

The symbiotic relationship with the Ghost Flower is shown when the Virtual Ghost Flower provides the group with the ability to recognise *resonant* behaviour. In this way both the virtual flower and humans are expected to evolve their understanding of resonant behaviour. Resonance takes place when voices or movements respond to each other within certain programmable parameters, which are inspired by the simple rules present in the self-evolving system, as well as by Conway's mathematical computational model, *Game of Life*.

Explanation of sprite: The original definition of a sprite has a double meaning: a 2- or 3-dimensional bitmap used in computer graphics, or a mythological supernatural ethereal entity often confused for a plant/flower.



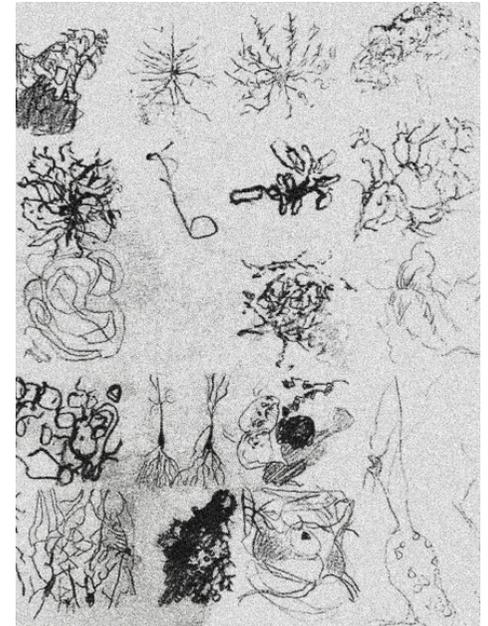
For example, when a participant uses their voice, breath or movement to give existence to a botanical sprite, if no other voice in the room responds to a first voice within the time frame of 30 seconds, the “botanical sprite”* will disperse as a consequence of inaction. However, if two or more individuals of the group are in resonance, it will *crystallize*, remain and continue to evolve. If too many voices are creating output simultaneously without listening or responding to each other though, the *sprite* will disperse from collective over-action (lack of listening).

If too little or too much *resonance* is produced, which the visitor sees in-headset as either too many dispersed or too many crystallized botanical sprites respectively, then the Virtual Ghost Flower will either become undernourished or overstimulated. As a consequence the Virtual Ghost Flower might

temporarily shut down into *hibernation mode or rebooting mode*. All participants will therefore play an active part in the evolution of the Virtual Ghost Flower. Every group’s unique behaviour will decide how the narrative unfolds, resulting in each group having an individual journey through the biosphere.

During a botanical sprite’s first biospheric day it will remain within the location where it crystallized. But after the first sun-cycle, a surviving *sprite* will evolve tiny moving particles within its form that will enable it to develop unique movement patterns, and eventually move through the biosphere to interact with other sprites. Each *sprite* will have a different age and character depending on when they came into existence. After some time a *sprite* will develop behaviours of reproduction. Humans will then be able to

also observe the sprites as they evolve towards new forms of further complexity.



Drawings for Botanical Sprites

Image description: The visitor explores finding resonance by using their voice to form botanical sprites, which is an extension and interaction with both Ghost Flower and the other visitors in their group. Their exploration is inspired by Bruce Damer's model for explaining the earliest life on earth. The Model describes how geology - inanimate things - formed life in the form of the simple one-celled photosynthesizing cyanobacteria, which were responsible for creating an atmosphere on earth. The model Damer uses is based on the idea of 'Tools by chance', which explains how life emerged in 'Darwin's pond' in cycles of wet/dry climate. Chains of building blocks like proteins and nucleic acids are pumped around in shallow water, and attach to each other in random ways, forming different 'tools'. For example, these tools could make a hole in a molecule, so that another can enter inside and bind with it to form polymer molecules, which either stabilized or popped and dispersed.



The life of a *botanical sprite* does not only grow around the group, it can also grow inside their bodies, like a parasite, using the body as a host and transforming the constitution of the mind and perhaps eventually their behaviour. This will most likely be communicated by text from the Virtual Ghost Flower. A *sprite* enters through the tail-bone and then ripples upwards through the spine, experienced as an upward spiralling haptic vibration. The group can choose to let it sprout out through the mouth by using their voices. When sprites are filtered through the body of the group, they will evolve much faster and further in their complexity. By engaging in this way, the group are becoming part of the Virtual Ghost Flower, gaining access to the flower's biological and virtual memory. In turn, like a parasite, the flower then becomes part of its host, transforming and changing their sense

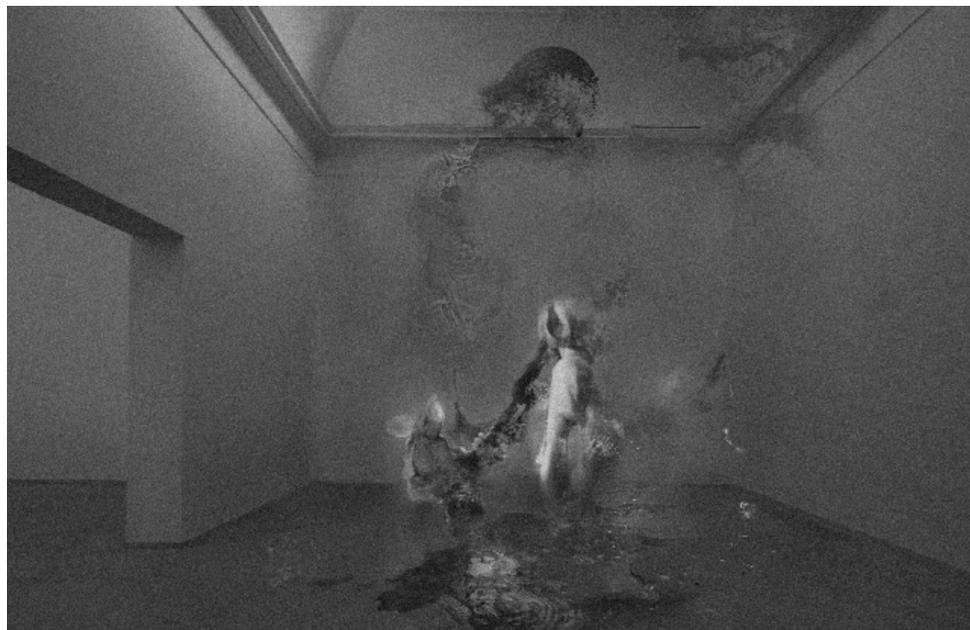
of self to one more attuned to resonant states. Occasionally and without a warning the biosphere will be struck by lightning, momentarily revealing the black burn mark of the physical room. The flower reveals and remembers its past, and a blue-print of past groups' traces becomes momentarily projected into the biosphere. The lightning strike is accompanied by a vibration of the haptic vests. After the violent intervention a shift occurs, rearranging the previously existing structures of *sprites*. As before, the sprites that do not survive (in lack of resonance) are dispersed as dead matter, black carbon dust onto the ground.

The group is, through trial and error, learning about resonant and non-resonant behavior. If a botanical sprite disperses, it becomes stored as information and knowledge carried forward by the group, in the memory of the

visitor of their success and failures at attaining resonance. In this way death carries a function to the dynamic system as a whole both within and beyond the biosphere. The biological Ghost Flower is known as a decomposer and therefore is often surrounded by dead organic material. A biological Ghost Flower often turns black before it begins to dissolve. This virtual waste product (the ash from dispersed botanical sprites) will with time grow into a lifeless emerging landscape below the group.

The more resonance fails within the group, the faster the landscape will grow, layer after layer, sediments of lifeless matter. With every new sunrise, a new geological scenario, (built out of the group's inability) materializes, revealing a new landscape at dawn. During the biospheric night, all botanical sprites freeze into ice and one can see the environment reflected within it, beautiful but potentially

dangerous. During the biospheric day the botanical sprites melt into a texture that feels more like seaweed. There are a minimum amount of sprites that need to crystallize in order to survive beyond sunset into the harsh, yet seductive, conditions of the biospheric night.



PHASE 4 SUBPHASE / duration: c. 3min

Can take place anytime between the 4th to the 7th sunrise

System survival responses; Hibernation and Rebooting mode

Hibernation mode: As a systemic response to a damaging environment, the Virtual Ghost Flower might enter Hibernation mode, a primitive computational defence mechanism triggered by lack of resonance. On the other hand, if the group is overproducing resonance, resulting in an evolutionary growth of sprites which is too rapid, the system will enter the opposite: rebooting mode, a primitive computational defence mechanism triggered by overproduction of resonance. When required, the group will receive a silent message from the Ghost Flower via rapid text, to feedback upon the group's ability to create resonance.

The flower can warn the group if they are approaching hibernation, or rebooting mode, to give the group a chance to change their behaviour. These states might feel like being suspended into a place in between worlds:

where time and evolution has temporarily been put on hold. Each group will not necessarily pass through all of these systemic strategies of self-preservation which radically transform their experience, it depends on the resonance they create.

Hibernation mode (inaction) is saving functional data/energy while stagnant. The group will perceive the room suspended in a timeless yellowish misty light, almost as if partly returning to the reality of the physical room. The light seems to emanate from an unknown source, like an everlasting twilight. The group will perceive static visual black and white representations of their bodies, but the representations are detached from the placement of their physical bodies. If the group uses their voice here, it will be strangely inaudible with a mute carbon dust falling out from the mouth. In order to be released

from hibernation mode, all participants of the group have to move as one to heat up the system. This is communicated by silent rapid text-signals from the flower. When the group moves in unison, the biospheric weather will shift and bring heat back into the system. The biospheric sky will develop thunder and rain, felt in the haptic vests. If the group succeeds to shift the biospheric weather, they will be able to return to the environment as it were before they entered hibernation. If the group does not come out of hibernation within 4 minutes, it will impact the state of the flower, and the group will be suspended in hibernation mode until the end of their cycle.



Rebooting mode: If too much resonance (over-action is produced, it results in uncontrollable growth of botanical sprites. A shut down/rebooting mode is then activated due to lack of listening. The group is plunged and suspended into a monochrome negative. If they try to use their voices in rebooting mode it manifests as distorted high pitched, corrupted voices, visually perceived as unstable sprites distorted by intense static. The sun will be oversized, fizzy, motionless, heating the group from below. This feels like being suspended in mid-air within an environment struck by drought. There is an evaporating mist, smell of burned electronics and the heat can be felt, through using infrared heating. As a defence mechanism, the biosphere will abruptly shift into biospheric night to cool itself. Though it never gets totally dark, the biosphere is suspended in an afterglow of low-level radiant

light. In opposition to hibernation mode, the group must here find a collective stillness, to be released from this state. If the group finds a united stillness, it will affect the biospheric weather and develop into a cold storm felt in their haptic vests and through real cold air blown into the biosphere. Everything around them will then freeze into ice and disperse into the landscape. Cold air exhalations will be seen as cloudy mist. The group can return, but all previous data will have been lost and corrupted. The sprites will have to be re-created from scratch, within the cold and now empty biosphere.

Considering the flower's parasitic origin, it remains unclear to the group whether the flower is in fact protecting or subtly manipulating the group into the system survival responses, pushing them towards biospheric drought or rainfall for its own

benefit. A biological Ghost Flower does in fact flourish in warm weather, after rainfall.

In the biological world, a damaged cell sometimes enters an ancient "default safe mode" that dates back to the origin of life itself - we know this as cancer. Like the role of death within this garden, states of hibernation, and rebooting are not necessarily negative for the evolution of this system as a whole, and are even necessary for the evolution of all parts.



| During the 8th biospheric sunrise
Ghost Flower is harvesting energy and preparing to grow

PHASE 5 / duration: c. 2min

Group is overpowered by the Ghost Flower

If the group has been able to be released from the survival responses of hibernation or rebooting, the Ghost Flower will at this point grow less dependent on resonance, and the human role within this system will become increasingly passive. The sprites have now multiplied and independently evolved into an infinite network of botanical sprites. The group might have the experience of feeling microscopically small in relation to the botanical sprites, and as a consequence they lose their sense of spatial direction; what is up and what is down. The group will be forced to find a new way to navigate and move within this unfamiliar environment. The experience might be like swimming around in a primordial soup; a school of fish with eyes in the back of their heads. The texture of air behaves differently and gives the characteristics of everything being

submerged in an unknown liquid. There are no longer any sprites emerging from the group's voices. Instead, there is a distorted, low volume empty sound coming out of their mouth with an unfamiliar reverb; as if their voice has been separated from their body and emerges from another distant location. The group is still in resonance with each other, but more as a form of primal communication, through silent haptic vibrations between each other.

Occasionally it seems like the Ghost Flower tries to communicate, but the text is either moving too fast for the group to perceive or it uses an abstracted language no longer recognizable by humans, resembling rhythmic signals of light. A hypnotic gradually accelerating beat will start to emerge from everywhere around them in rhythm with the light evolving into complex rapid hypnotic

blinking patterns. Through subliminal messages, the group is somehow asked to perceive the emerging black and white light-patterns at the inside of their eyelids. There is nothing else to do than to allow oneself to be seduced into a collective trance state. Humans are no longer the superior intelligent life form within the biosphere, and the group must come to terms with the feeling of losing control and having no effect on their surroundings.

A parasite can sometimes alter the behaviour of their host through interfering with their neuro-chemical patterns, this interference might paradoxically play a part in the biological Ghost Flower's hidden medicinal abilities. If eaten, it interacts with the human nervous system, able to modulate large amounts of information and has a dream altering effect. The individual often feels like

standing beside their own pain, watching it happen from the outside. The group is now put in closer contact with the healing power of the plant. When a biological Ghost Flower is mixed into a medicinal substance, it turns purple, and for the first time a colour manifests into the previously monochrome garden. A deep purple gradually comes into existence.

| During 8th biospheric sunset and 9th sunrise
Ghost Flower is growing, flowering and seeding

PHASE 6 duration: c. 4min

Group perceives from the flower's perspective

Through surrendering, the group is starting to merge with the innate Ghost Flower cell memory, now becoming ready to grow upwards, extending their white spine-like stems towards the sky. When a biological Ghost Flower grows, its head is tilted forward. Like the flower, the group's field of vision is also stuck into a forward tilted position.

The group is growing upwards together with the movement of the invisible Ghost Flower, seeing the ground of the biosphere sinking far below them, until it wanes into a tiny distant glowing dark point, onto an all surrounding white wax-like biospheric sky. It might feel like slowly falling upwards and becoming suspended in a thick white mist.

The group's field of vision will then slowly straighten into an upright position pointing upwards, mimicking the behaviour of the biological flower. When a biological Ghost

Flower flowers, it transforms from white into black, before beginning to dissolve. The white sky is now dissolving into total blackness, like black ink is slowly being poured over it. The Ghost Flower still attempts to communicate with the group: displaying fast texts that will invite them to lay down on their backs.

The message reaches the group, they lay down on the floor, and see the dark inky void above them. There are tiny points of lights in the distance, appearing like miniature lightning storms, neural networks, synapses of distant signals passing through an unknown universe?

Suddenly you find yourself alone. Could there be other biospheres far above? Did the others in the group travel there? Through the visuals in VR the space expands to feel infinite. Sound shifts and there is a marked contrast in visuals: where the group have

seen each other for a few moments they then disappear. Even if it does not feel like it, the group is still connected - like a group of vastly spread out planets and stars who share an extensive history together spanning billions of years.

Everything is strangely mute, like falling through a silent film. In the absence of haptic vibrations, it almost feels like the physical body, laid on the floor, has dissolved into the black sky. One of the lightning storms suddenly starts to move closer from far away. Without any time passing the lightning storm passes through you. But it's not a lightning storm. It's the headlights from a car moving fast across a night time motorway intersection, passing right through your body. It does not see you and it does not hurt you it just moves through you. The vibrations in the vest are intense, the sounds overwhelming,

a sense of danger and dissonance with your environment. You might give in, surrender and allow car after car to pass through your invisible body. You experience this scenario from a prism or kaleidoscope multi-layered perspective, as if different timelines are overlapping

Motorway intersection
Stromatolites sedimentary layers



This image is an overview illustration of the components in this section of the Garden. The end result will not strive for photo realism, but rather a microscopic and haptic rendering of reality.

When passing under water the visitor experiences mostly darkness, sound and vibrations in the vest

You are eventually sinking through the ground, down through the layers of the motorway, melting through the different layers of geological sediments of failed resonance, that your group created in the past. You move through your own history of virtual geology. Your sinking body creates a trace - perhaps a fossil to be found in the future. You are no longer looking at the world, it is looking back at you. The flower has grown more aware than you. You are now able to reflect that the human current state is perhaps only a beginning for the continuation of life to come. We may be the cyanobacteria equivalent for some future hyper intelligent being. You may experience a feeling of being overwhelmed, sadness, letting go, relief, beauty, humbling - what role our actions or inaction will play in the far future - will we become extinct - will we surrender?

Slowly the almost forgotten presence of the physical biosphere will return. The familiar smell of lightning and burned electronics will be felt. The group will for a moment see themselves laying down on the ground (via live kinect). Looking back at a landscape of themselves - seeing the resonant bodies from above - like living cells vibrating in a petri dish. A mist eventually passes and obscures their vision. The group removes the headsets in the biosphere, and sees the physical space, they see each other, and they see the dark carbon spot on the ground before the custodian opens the biosphere door once more and invites them to walk out.



APPENDIX 1

Draft Script for Custodian's Introduction

The Garden of Ghost Flowers *An imagined introduction by the System Custodian*

What is this experience? As a group you will enter the biosphere, (the contained space behind this door) and interact with a virtual life-form called "Ghost Flower". The experience will last a maximum of 9 virtual sunrises. That's 30 minutes to you and me.

Who or what is Ghost Flower? It's a virtual flower – an Artificial Intelligence. However, it was originally programmed with code directly taken from a real biological Ghost Flower cell and so it is actually a hybrid. It has some of the real Ghost Flower's innate memories and characteristics. For example, in the wild the real Ghost Flower is a parasite that likes to feed off the energy in fungi made by networks of trees. This virtual flower has adapted to its new state and environment – in this biosphere it seems to feed off an invisible energy source

made by networks of people called "collective resonance".

What is "collective resonance"? It is the result of human behaviour in a group – the more successful the collaboration in the group the more resonance you produce. Resonance does not necessarily mean unison and harmony but it does mean listening, caring and responding. There is no real right or wrong but you will know if you're not producing enough resonance for Ghost Flower (by lack of collaboration) or producing too much (by lack of listening.) Ghost Flower will give you signs if this starts to happen – if it does happen you may end up in hibernation or re-boot mode for a while, this seems to be Ghost Flower in survival mode.

How do we know that we are resonating? Each group is different and so is the resonance they create but you will clearly see and feel

when you make resonance via this wearable technology - a VR headset and haptic vest. You will also have headphones and a microphone. All of these are connected to Ghost Flower– this technology ensures flow of information between you as a group and Ghost Flower.

How do we create resonance? Simply use your voice and your movement and even your breath. Do not be alarmed if you look and sound differently inside the biosphere. You are going to perceive each other very differently in there – imagine how a plant might perceive you. It will become clear that it is not about language or gesture but the listening and responding as a group and what happens in the spaces between you, so feel free to explore. Ghost Flower is learning and evolving over time so you can trust it to guide you – it's finding ways to communicate as it evolves. Of course, like all AI and indeed biological evolution, errors can occur – previous groups behaviours may have altered the code or DNA of Ghost Flower so there is a chance you may experience glitches (almost like a virus or an abnormality). It's OK it's all part of the evolution.

What is the impact? Whatever you do in there will impact the Ghost Flower's evolution and you will be able to see your impact directly. The resonance you make in the biosphere will be visible in your headsets and will be felt in your vests. When you leave you will also see your impact on Ghost Flower via a living blueprint of its virtual form which is on display just outside this exhibition as well as here www.virtualghostflower.com (shows them the website on a screen). This section for example, is the trace of the previous group – as you can see at the third sunrise they got stuck in hibernation mode and were there for quite a while. Whatever state you leave it in is where the next group will pick up. You might even be able to perceive the previous groups resonant energy as you enter the biosphere. The Ghost Flower learns from you but it also gives back. Ghost Flower seems to like sharing

it's knowledge and virtual memory, all the way back to its biological life and origin. It will give you the tools you need for resonance inside the biosphere. After you leave you will be a part of its memory – a part of the infinite life of the Ghost Flower. Will it still be a part of you?

(WORKING TITLE) GARDEN OF GHOST FLOWERS

Presentation of result after research period 2020

Lundahl & Seidl / With Rachel Alexander and Emma Ward