



*Illustration: Joanna Zawieja / Zander Auerbach*

## **SPRUCE TIME**

### **The oldest tree in the world at the new hospital in Malmö**

When the new hospital grounds in Malmö [Nya Sjukhusområdet Malmö] are inaugurated in spring 2025, the world’s oldest tree will take root in the walkway outside the main entrance to the hospital.

The oldest tree in the world is a spruce on Fulufjäll mountain in the central Swedish county of Dalarna. Researchers have been able to date elements of the tree’s root system to at least 9,550 years old. This spruce tree has essentially lived through the entire Holocene—the geological epoch dating back to the most recent ice age.

This spruce will be cloned.

While the cloned tree will be the oldest in the world, this clone will also be a sapling starting its life at the beginning of a new geological epoch, frequently referred to as “human time” —the Anthropocene. Patients, staff, and visitors who return to the hospital over the course of their lives will be able to follow the ancient tree’s growth and development, as a living memory from another time.

The tree will have its own “care building”: a computer-controlled greenhouse attached to the hospital’s existing cooling system, where the needs of the tree determine the climate. The greenhouse becomes a customized miniature hospital responsible for the care of this single tree.

Spruce Time will stand out as a landmark for anyone visiting the hospital, and will also offer an opportunity for a more contemplative engagement with the tree. By appointment, anyone who so wishes can enter the greenhouse, rest on a bench that surrounds the tree, and take part of the tree’s climate. On this intimate level, the work can serve as a space for meditation and reflection.

Spruce Time is a living artwork that operates on three scales: the monumental scale is conceptual and narrative—stories generated by the fact that “the oldest tree in the world has been hospitalized in Malmö”; the built scale offers a visual analogy between the hospital and the health care system surrounding the spruce; and the human scale is the opportunity for staff as well as patients, friends, and family to encounter the tree on a daily basis and follow its development over the course of a lifetime.

## **POINTS OF DEPARTURE**

Here, Spruce Time is presented from three different perspectives that each contextualize the work: the Tree, its Care, the Viewer.

### **1 THE TREE**

#### **1.1. Mythology of the Tree**

The first known human depictions of trees are approximately 10,000 years old. They can be found on cave walls in what is today northeastern Brazil. The trees appear to be elements in some form of ritual: people dancing beneath branches, carrying trees, worshipping them.



*Detail from cave painting Pedra Furada, northeastern Brazil. Ca 9 650 years old.  
Photo: [Creative Commons](#)*

For as long as history has been visually recorded, the tree appears to have been a symbol of life and fertility, but also of a cosmic order: the tree connects the sky, the earth, and the underworld. The “tree of life” recurs in various forms: in the Garden of Eden, as the world tree Yggdrasil in Norse mythology and Wakah Chan in Mayan mythology, as the banyan tree beneath which Buddha is enlightened, and as the origins of the first two humans in Zoroastrian cosmology.

In more recent Swedish cultural history, the spruce holds long-standing ritual meaning and has played a central role in Nordic folklore. Today’s Swedish Christmas tree has its predecessor in so-called *julstänger*, or Christmas poles—spruce branches attached to poles placed outside the home to ward off evil spirits. And, up until about a century ago it was customary to line the funeral procession’s route to the cemetery with spruce trees, their tops broken in the direction of the church in order for the spirit of the dead one not to turn around.

In her project “The Swedish Series” (2005), the artist Ann Böttcher compiles Swedish cultural references to the spruce tree over the past 400 years. Through her work, one can follow how the spruce went from being loathed during the Late Baroque period—it did not fit with the leafy French landscape ideals of the era—to becoming a central symbol in 19<sup>th</sup> century National Romantic painting and burgeoning Swedish nationalism of the time.

During the 20<sup>th</sup> century a brighter image of the spruce also emerges, in everything from children’s stories by Swedish author Elsa Beskow to the *Mulleskola*—outdoor schools of the 1970s. The forest and the spruce are central motifs in the work of canonical Swedish

authors such as Harry Martinsson and Sara Lidman. When Lidman in the 1980s publishes a collection of political essays, it is titled *And the Tree Answered* [Och trädet svarade]. The collection takes as its point of departure a passionate love story, where Lidman as a five-year-old is chosen by a spruce that initiates her into a universe of wordless relations.

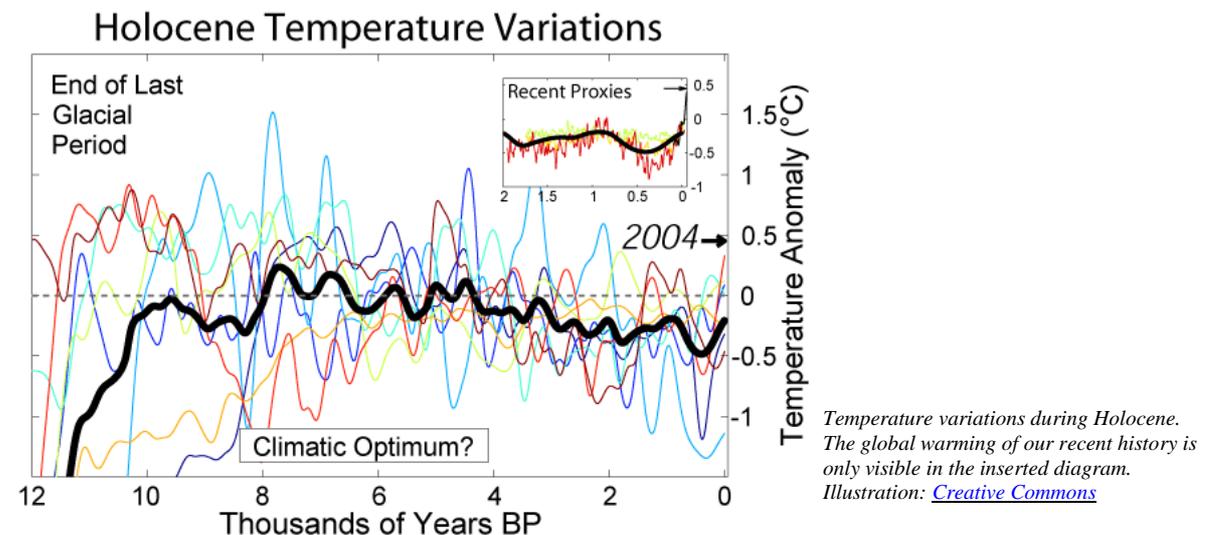
It is this deep history of a wordless universe that we are calling “Spruce Time.” While humans in northeastern Brazil made the first cave drawings of trees, nearly 10,000 years ago, a spruce took root on Fulufjäll mountain in northwestern Dalarna. There, it has survived over the course of millennia by repeatedly cloning itself.

### 1.2 Cloning and the Dream of Eternal Life

Old Tjikko, as the spruce at the top of Fulufjäll mountain is called, is a relatively small windswept tree. It is one particular section of the tree’s root system that has been dated to 9,550 years old. In general, spruce trees reproduce sexually, through pollination, but under certain circumstances they can also clone themselves through so-called vegetative reproduction.

The hypothesis is that Old Tjikko has been able to repeatedly clone itself thanks to the thick layers of snow that weigh down the tree in wintertime, allowing some of the lower branches to take root in the ground and to grow up as new trees with an identical DNA sequence.

To clone is thus a form of knowledge that the spruce itself possesses. But the notion of cloning evokes the fantasy of immortality and eternal life. (Please see our discussion of the cloning method in the implementation section below).



### 1.3 The Tree as Time Machine

The spruce at the top of Fulufjäll mountain has in essence lived through the entire Holocene, the geological epoch dating back to the most recent ice age, marked by profound climate changes over the course of millennia.

Old Tjikko has experienced nearly 3,000 years when average temperatures were two to three degrees warmer than they are today. During the so-called Atlantic Period, land in the region was fertile, with grapes growing all the way up into Dalarna and hazelnuts in northern Norrland.

But that same spruce has also survived the cold Fimbulwinter, described in Norse mythology as an unequivocal sign of Ragnarök—the end of the world. And it has lived through the even colder Little Ice Age, when humans experienced a global climate crisis with recurring crop failure, mass starvation, and epidemics.

The oldest tree in the world has lived through all this.

The clone that takes root on the new hospital grounds in Malmö will be housed in a customized greenhouse—a “tree chamber”—that regulates the climate according to the tree’s need for light, temperature, humidity, carbon dioxide, and nutrients.

The spruce is a relatively hardy plant, but the provenance of each individual tree is crucial in determining its climate needs. Thus, the tree from Fulufjäll mountain will do best under conditions that most closely resemble its place of origin, but as we have seen, those conditions have varied greatly over time. To house the oldest tree in the world in a climate-controlled chamber can be seen as producing a time capsule from an epoch that is coming to a close.

The clone planted on the new hospital grounds will also be an entirely new sapling in the early phase of its life. And, as is all the more frequently asserted, in the early phase of a new geological epoch put forward as the human epoch—the Anthropocene—in which our fossil-fueled societies are the primary force in contemporary climate change.

The more rapidly today’s global warming proceeds, the more drastic we presume the contrast to be with the climate the spruce has experienced on top of Fulufjäll mountain.



*Gathering spray form Old Old Tjikko, December 2019. Field technician Mats Eriksson, Skogforsk.  
Photo: Nils Magnus Sköld / Region Skåne.*

## 2. THE CARE

### 2.1 The Tree Chamber

Over the years, the Swedish timber industry has financed extensive research concerning growing conditions for spruce, with special attention to strengthening defenses against pathogens, increasing growth rates, and in other ways improving timber industry yields. This research focuses on the forest (“population level”) rather than on individual trees, and is primarily conducted in the field rather than in enclosed tree chambers.

There is, however, research available concerning growing conditions for spruce trees in enclosed climate-controlled facilities, in particular the work of Ingegerd Dormling in the 1970s and 80s at the former College of Forestry in Stockholm. We have been informed of this work by Professor Emeritus Sune Linder, who developed tree chambers for spruce trees as part of his own research on global climate models and the impact of carbon dioxide levels on spruce growth.

Spruce Time focuses on the survival of a single individual/clone (rather than forest growth or yield). Can we make the cloned spruce from Fulufjäll mountain survive in our enclosed chamber and, if so, what climate conditions are required? Research in the field indicates that evergreen trees that survive the longest generally live under particularly challenging conditions, often marked by exposure to a powerful stress factor during their early years, which activates a stronger immune defense in the tree.

Malmö is located south of the natural range for Norway Spruce, *Picea abies* (to which Old Tjikko belongs), and more than 400 beeline miles south of Fulufjäll mountain. Sweden is divided into eight hardiness zones, where Malmö is located in Zone 1 and Fulufjäll mountain in Zone 7. In addition, we can assume that the walkway where the tree is to be planted, between two 200-foot-tall hospital buildings, will be warmer and darker than Malmö in general.

In light of these conditions, as well as imminent climate change, the tree chamber is in all likelihood critical for the long-term survival of the cloned spruce. But the chamber also introduces a visual analogy, a life support measure that reflects activities in the adjacent hospital.

Spruce Time highlights the hospital’s focus on individualized care and patient safety. But it also reflects the violent side of care—the normative violence inherent in defining what is healthy and sick, physically/biologically desirable or not, which treatments should be prioritized and at what cost. The tree chamber as a structure contains this duality—the careful tending of a unique tree, which at the same time makes visible what a life-sustaining technology involves.

Visually, the work plays with both similarity and contrast in relation to the nearby hospital infrastructure. The care taking place inside the tree chamber can bring to mind incubators and other medical equipment found inside the hospital. The tree’s survival is also materially linked to the functioning of the rest of the hospital, since the necessary cooling of the tree chamber during the summer utilizes the cooling system of the adjacent hospital building.

At the same time, the chamber’s cylindrical shape and transparent glass wall contrast with the more angular and covered building exteriors. In this way, Spruce Time becomes a distinct visual reference point on the hospital grounds.

In conceptualizing the tree chamber, we have collaborated with Zander Auerbach, architect and engineer at the MIT Media Lab, who directs their project to develop a computer-regulated biosphere guided by sensory data from individual trees. However, in the implementation of Spruce Time we are collaborating with climate consultant Sune Linder, as well as the glass- and greenhouse construction company UBA.

## **2.2. If the Tree Dies**

Spruce Time is a living artwork, and the intention is for the tree to live for as long as possible—with eternity as the horizon.

During the initial phase of the project, we will generate as resilient a clone as possible. And we will attempt to ensure that the tree planted on the hospital grounds has the most beneficial growing conditions possible.

But contingency is also critical to this work, the fact that there is a life at stake, as is the case on a daily basis inside the hospital. Therefore, it will be crucial to determine future care needs, and to provide for the long-term maintenance of the work.

If, in spite of these efforts, the tree should die within 50 years, yet another narrative layer will be added to the project. This will not pose an artistic problem, as it is an inescapable condition of all living matter.

## **3. THE VIEWER**

### **3.1 From Hearsay to Intimate Contemplation**

Your first encounter with Spruce Time might be via an acquaintance who asks, “Have you heard that the oldest tree in the world has been hospitalized in Malmö?”

We believe that Spruce Time has the potential to function as a landmark. Not as a visual symbol mounted at the top of a building, but as a story that makes the New Hospital Area in its entirety a symbol for the artwork.

Spruce Time can circulate as a news item and as hearsay. The work can come to attract people from far and wide to visit the hospital. And the tree’s growth and flourishing can, over time, contribute additional growth rings to the narrative.

For someone making their way across the hospital grounds, Spruce Time constitutes a clear architectural landmark and a visual analogy for the hospital. But the piece also offers an opportunity for a more intimate engagement with the tree. Whosoever desires can enter the greenhouse, sit on a bench that surrounds the tree, and take part of the tree’s climate. On this intimate level the piece can function as a potential space for meditation and reflection. Perhaps new parents will want to conduct a naming ceremony around the tree. Perhaps a five-year-old, like the young Sara Lidman, will fall in love with the spruce.

In the middle of this busy passageway will be a space for contemplation. A place where one can encounter a tree and follow its development over the course of a lifetime.



*Grafting spray from Old Tjikko onto the root of another spruce. Grafting expert Eva Persson, Skogforsk.  
Photo: Henrik Lund Jørgensen / Region Skåne.*

## **IMPLEMENTATION**

### **1. Cloning**

The easiest and most cost-effective way to clone Old Tjikko would be to replant a root cutting from the tree. A new tree, with identical DNA, would then grow. However, upon inspection in the field in the summer of 2019, no suitable root cuttings could be identified.

As a result, we are planning to engage in a method that begins with gathering twigs/spray from Old Tjikko. These are to be grafted onto another tree as a clone, but with the other tree's root system still intact. In order to generate a complete clone, including root work, a cutting will then be taken from the grafted tree during its juvenile phase (within the first five years after a successful grafting).

In this grafting process we are collaborating with Skogforsk (the Forestry Research Institute of Sweden) via researcher Andreas Helmersson, grafting expert Eva Persson, as well as field technicians Thomas Hjerpe and Mats Eriksson. As Old Tjikko is located in a conservation area (Fulufjället National Park) special dispensation is required from the County Administrative Board in Dalarna in order to gather spray for grafting. Such permission was obtained on October 18, 2019 and spray was collected from Old Tjikko on December 5, 2019.

The goal is to generate several sapling clones during the period leading up to 2025, in order to ensure that we have as resilient a specimen as possible to plant for the inauguration of Spruce Time.

### **2. To Plant a Story**

As an artwork, Spruce Time begins as soon as the cloning process is underway, and can be communicated even during this initial phase.

A sapling clone could be temporarily housed in a suitable building on the hospital grounds, until the site for Spruce Time has been fully prepared, thus establishing the project's presence during the construction period. This would also be a way to engage interested staff members in the project, and to highlight the links between research and caregiving activated by the artwork, which in turn also reflect the different activities taking place on hospital grounds.

### **3. The Tree Chamber**

The customized greenhouse—or “tree chamber”—is the central built element of Spruce Time. The chamber should be constructed primarily to meet the needs of the tree, so as to ensure its long-term survival. At the same time, we strive for an accessible environment where it is possible for visitors to enter the chamber and sit by the tree.

Climate needs are determined in collaboration with Professor Emeritus Sune Linder, and consist of regulating temperature, humidity, light (primarily number of daylight hours), carbon dioxide levels, soil substrate, nutrients and water. The proposed contractor for the construction is the glass- and greenhouse company UBA. Planning will be coordinated in concert with that of nearby buildings, from which the tree chamber will derive electricity, water, and cooling.

The proposed shape of the tree chamber is a cylinder measuring 16½ feet in diameter and 29½ feet high. The artwork is integrated into the surrounding exterior environment, in dialogue with relevant landscape architects.

### **4. Inauguration: Planting**

The actual planting of the cloned spruce tree will take place at the very end of the construction period, in conjunction with the inauguration of the artwork, both to ensure that ongoing hospital construction does not damage the sapling or its roots, and to make the planting a symbolic act with communicative potential for the work.

### **5. Care**

In light of the artwork’s extended timeline, it is important to establish a long-term maintenance plan. At the same time, it is beneficial if the terms of such agreements do not run for too long, but can be revised as needs change. The tree will be most vulnerable during the initial ten years. If technical components need to be repaired or exchanged in the long term, technological developments may have transformed the available options.

As planning and implementation of the work proceeds, future upkeep needs will be explored in collaboration with relevant parties. These will lay the foundation for long-term maintenance.

*Translation: Jennifer Hayashida*



*Model from proposal, scale 1:20. Photo: Henrik Lund Jørgensen / Region Skåne.*