

**C**AN A MUSICAL PERFORMANCE LAST FOREVER?  
Or even just, say, a thousand years?

On its face, the idea of creating a structure that reaches past the shuffle of this mortal coil seems itself timeless: the Egyptian pharaohs built elaborate temples and tombs, and had themselves buried with treasures and even ships that they wanted to take with them into the next world. The engineers and masons who began the great cathedral of Notre Dame knew they would not live to see the project's completion.

Those projects, designed to last centuries, had the advantage of fitting in with religious beliefs of the day, demonstrating faith by building something that seemed to surpass the limits of human capacity.

Inspired by the turn of the millennium 17 years ago, a select pool of artists, engineers and entrepreneurs are giving that age-old problem a more practical, 21st-century twist: to open a channel that will allow us to interact with a future many generations hence, spanning the distance from here to humanity's farthest horizon.

Three different projects – each in its own way – are playing compositions to the distant future and inviting anyone around at the far end to sing along.

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# Millennium JUKEBOX

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## THE BIG PICTURE

CONCEPTUAL ARTIST AND COMPOSER JEM FINER, who was also co-founder of the Irish folk-punk band The Pogues, crafted a non-repeating piece using a relatively simple algorithm. Titled *Longplayer*, its computer-guided performance has already started – but don't worry about coming in late. It began December 31, 1999 and will continue for the rest of your life, your children's lives, their children's lives and so on, for roughly 40 generations, before finally ending on the same date in 2999.

**Brunswick's  
CARLTON WILKINSON**  
talks to leaders of  
three projects  
calling the tune for  
listeners hundreds  
of years hence

PHOTOGRAPH: RONNIE GÖTTEL, COURTESY OF THE JOHN CAGE ORGAN FOUNDATION



### **"AS SLOW AS POSSIBLE"**

That is the instruction at the top of the score for John Cage's *Organ2/ASLSP*. Taking that to heart, an ongoing performance at the former Sankt Burchardi Church in Halberstadt, Germany will continue until 2640. One chord can last for years. To keep costs down, organ pipes are replaced only as needed. Sand bags sustain the tones, holding open the valves that serve as organ keys.



“Here, it’s just this sound. You can listen for five minutes, 10 minutes, one hour, two hours. And it’s like approaching a feeling of eternity”

**RAINER NEUGEBAUER,**  
Chairman, Board of  
Trustees, John Cage  
Organ Foundation

## LONGPLAYER

Jem Finer’s 1,000-year-long composition *Longplayer* is being performed in its full length using a computer and recorded sounds. Excerpts of the full composition have been performed by live musicians, as shown here. Tibetan singing bowls are arranged on tables set up in concentric circles, a pattern reflective of the work’s structure.

One thousand years of continuous performance – the only requirement is that some representative of humanity survives to maintain it.

“It’s easy to think about how to create an artificial intelligence that would keep *Longplayer* playing,” Finer says in a recent phone interview. “But I’m more interested in getting humans to work together to keep it going. I like the idea that people have to collaborate. In this case, most of the collaborators aren’t born yet and some of them won’t be born for 900 years or more.”

Similarly, a performance of John Cage’s *Organ 2/ASLSP* – a 1987 piece for solo organ designed to be played “as slow as possible” – could involve multiple generations of performers. A current interpretation can be heard at a medieval church in Halberstadt, Germany – or at least, one chord. The concert began in 2001 and is to last 639 years. Each tone or simultaneous combination of tones is sustained, sometimes for months or years. The last time the notes changed was in October 5, 2013; the next change isn’t due until September 5, 2020. These events are treated like astronomical alignments, attracting a crush of tourists to the small town.

“At the last chord change in 2013 there were 1,500 people from all over the world in Halberstadt,” says Rainer Neugebauer, Chairman of the Board of Trustees of the John Cage Foundation in Halberstadt, a small city of 43,000 people. “The whole town was overbooked.”

The Halberstadt church has an earlier place in music history: in 1361 it became the site of the first organ with a modern keyboard, consisting of keys arranged in what we now think of as the standard configuration – 12 keys in an octave, black keys shorter and raised slightly higher than the white. That was 639 years before the year 2000. The Halberstadt *ASLSP* performance was to begin in 2001, and so the organizers chose 639 years as its length – a way of honoring the site of the invention of the modern keyboard and propelling the town’s keyed history into the unforeseeable future.

## THE EVEN BIGGER PICTURE

ON A SCALE OF BOTH TIME AND ENGINEERING ambition, both *Longplayer* and Halberstadt are dwarfed by a project initiated by Danny Hillis, an inventor and MIT graduate responsible for many advances in artificial intelligence and supercomputers. Hillis wanted a way to measure time on a non-human scale, to inspire visions of the far future that seemed in short supply.

His solution? A really big clock. Where a normal cuckoo clock marks the quarter-hour, hour and 12-hour marks, this one would use chimes and animations (more elaborate versions of the cuckoo popping out of its cubby) to mark the years, decades, centuries and millennia. Where a grandfather clock typically completes its cycle of chimes and animations every 12 hours, this one will take 10,000 years.

“I wanted a symbol of the future, in the same way, let’s say, that the pyramids are a symbol of the past,” Hillis says in the short online film, [The Clock of the Long Now](#).

The project gained the support of some celebrity visionaries. Composer Brian Eno wrote the music for the clock’s chimes, a sequence of tones that won’t repeat for 10,000 years. Stewart Brand, publisher of the 1970s counterculture bible the *Whole Earth Catalog* and tech philosopher of long standing, is Co-Chairman of the Long Now Foundation, created to support the project. (See *Brunswick Review*’s [“Generations” issue](#) for more on Brand’s visionary work.) Many early supporters of the 10,000-Year Clock were Silicon Valley tech entrepreneurs. The actual site chosen for the clock, which will stand 200-feet high, is deep inside a mountain on land in West Texas donated by Amazon CEO Jeff Bezos.

On a [website describing the project](#), Bezos describes his interest. “As I see it, humans are now technologically advanced enough that we can create not only extraordinary wonders but also civilization-scale problems. We’re likely to need more long-term thinking.”

Five “room-sized” chambers have been carved out around where the clock’s mechanism will sit, inside the mountain, one for each of the animations that will occur at the one-year, 10-year, 100-year, 1,000-year and 10,000-year marks.

In his 1996 article on the possibility of artificial intelligence, [“Something that goes beyond ourselves,”](#) Hillis pointed out that the year 2000 had been the target for projections of the future for decades, with few people looking further out. With technological innovation becoming faster and technology more complex, people had simply given up trying to imagine what distant tomorrows might look like.

“The future has been shrinking by one year per year, ever since I was born,” Hillis wrote. “I think something’s happening now – and will continue to happen over the next few decades – which

is incomprehensible to us, and I find that both frightening and exciting.”

As well as composing the music for the clock chimes, Eno suggested the “Long Now” as the name for the organization. In a video of a foundation seminar, he described how the project fed his growing fascination with time and the way so many people seem to live oblivious to their connections to both past and future.

His music of the 1980s – in particular his collaboration with David Byrne that pioneered the technique of sampling the recorded sounds of others, *My Life in the Bush of Ghosts* – was part of Eno’s reaction to this obliviousness. He called that music “a celebration of being alive in a big world and being able to handle the variety – not putting fences around it.” Eno added that he hoped the clock project was an opportunity to build on that message.

In the face of a world moving ever faster, Eno said, “we felt that really there was a need to create some new form of human thinking about time.”

### WHY MUSIC?

ALL THREE OF THESE ULTRA-LONG-TERM CONCEPTS involve music – specifically, the unfolding of a musical composition or pattern over a vast period of time. From our most ancient days, music has served as a foundation to all ritual, a link between the hard, banal stones of rational thought and the soft, dark mysteries of dreams, emotions and the unconscious, reaching through and beyond time, into the spirit world and the cosmos. Music enhances individual identity and yet is weirdly self-annihilating, blending us into each other and into the underlying patterns of nature’s greater order.

Paleoanthropologists suspect that music, dance and language all evolved from a single set of communication tools. Language became increasingly specialized, splitting off from music to become something different – clearer, more constructive, better suited to the dangers and resources of the physical world. But when measured against the totality of existence, the space illuminated by the language’s firelight is still relatively small; music – more primitive in usage and more primal in effect – aims wider and pitches us into the surrounding, overwhelming darkness.

Through music, we are again the creatures we once were, who saw the world as an end-to-end ritual, all-consuming, hazily defined, entirely magical. Roughly 40,000 years ago, at the dawn of modern man, our species began leaving

artifacts that hint at how important music already was as a separate pursuit: flutes made of bird bones and mammoth ivory, reconstructions of which can still be played and sound eerily familiar.

Words are very good at describing the physical world; music survives because, as a species, it describes for us what words cannot. Centuries from now, humans won’t speak the same language or completely understand our society. But music, if history is any indication, will still resonate. As those bone flutes speak to us across 40,000 years, these projects may speak to our descendants.

### LAYERS OF TIME

FINER, THE CREATOR OF LONGPLAYER, HAS A LONG personal history of sound exploration. His first musical experiences were with The Pogues, a band that infused traditional Irish folk song styles and instruments with a punk attitude.

Pop music has a built-in immediacy and a time constraint – whatever you have to say, has to be said within the range of a 2-to-5-minute song. In the 1990s, as he stepped away from the Pogues, Finer found himself drawn to different expressions of duration.

“Initially it wasn’t going to be a piece of music,” Finer says, of *Longplayer*. “It came about from having spent a few decades curious about the workings of time on all scales. Time as we experience it; time as the universe experiences it and the intervention of clock time.”

As the sounding instruments in *Longplayer*, Finer uses Tibetan singing bowls, brass percussion instruments found in Buddhist rituals that have a deep history themselves and an aura of timelessness. Excerpts of the composition have been performed live – singing bowls of various sizes are arranged in concentric circles, within which the musicians’ performance appears as a dance.

But anyone can [listen online to the ongoing computer-aided version](#): a single recording 20 minutes and 20 seconds long of singing bowls and silences is used as a source for a program that samples and performs the music. The computer algorithm will cycle through non-repeating patterns from this recording for 1,000 years before it returns to its opening.

“I don’t know how it’s going to sound all the way through,” Finer says. “There are probably going to be decades that to my ears are going to sound absolutely awful. But there’s no way of knowing. I kind of like the feeling of having created something

“I like the idea that people have to collaborate. In this case, most of the collaborators aren’t born yet and some of them won’t be born for 900 years or more”

**JEM FINER,**  
artist and composer,  
creator of *Longplayer*

### BIG TIME

The 10,000-Year Clock working prototype stands 8 feet (2.5 meters) tall and is currently on loan to the Science Museum in London where it is part of the “Making of the Modern World” exhibit. Designed primarily by Danny Hillis, the device began keeping time December 31, 1999. The full-scale model will be roughly 200-feet tall.

DRIVE  
REWIND  
SPIRALS

SPEED  
GOVERNOR

DIAL  
• 5 DIGIT YEAR  
• HORIZONS  
• SUN  
• MOON  
• STARS

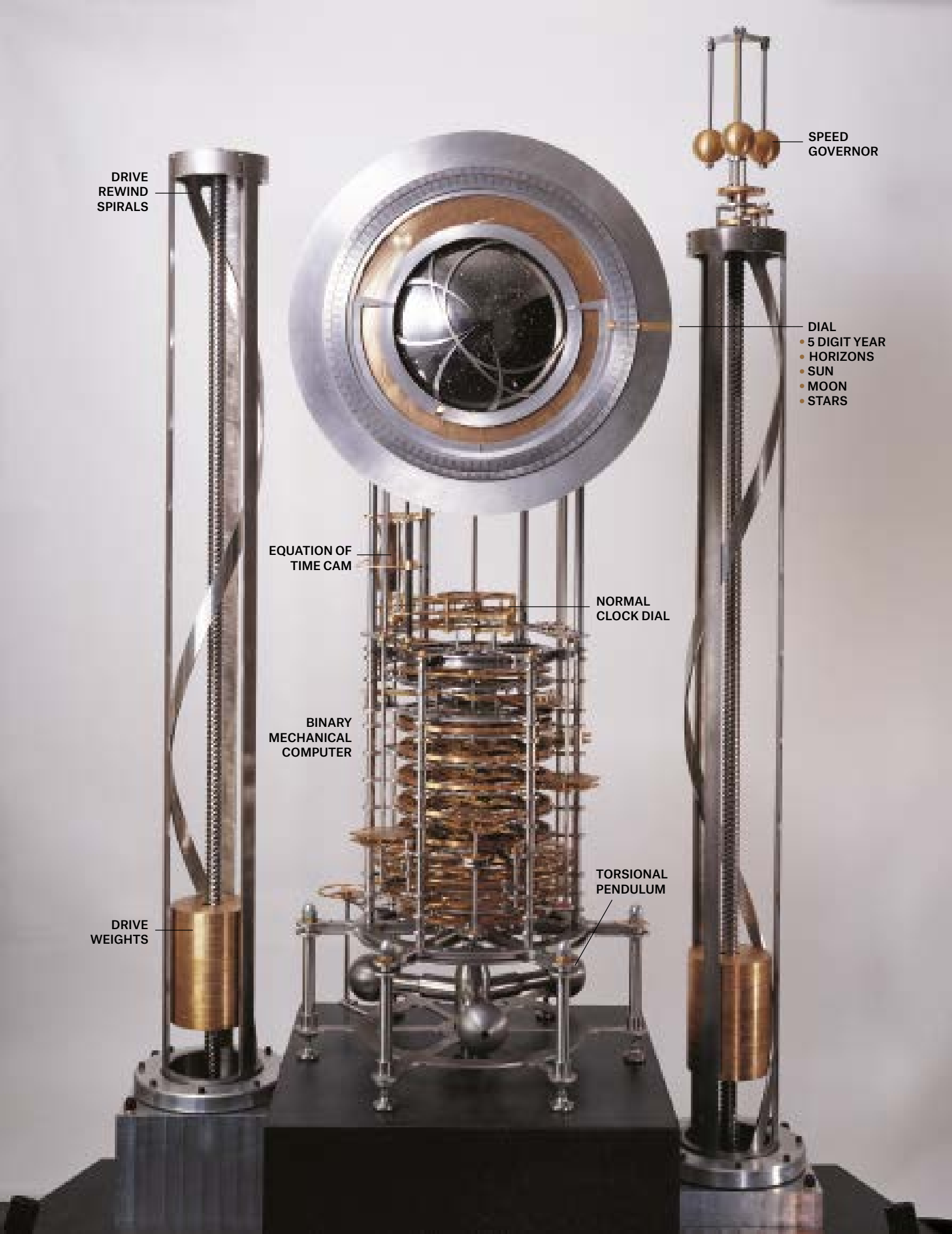
EQUATION OF  
TIME CAM

NORMAL  
CLOCK DIAL

BINARY  
MECHANICAL  
COMPUTER

TORSIONAL  
PENDULUM

DRIVE  
WEIGHTS



that there's no way I can know how it turns out. In a sense, the music's not important. What this is really about is about time – trying to realize what for a human being would be a very long time span and how one relates across that time span.”

Merely ensuring that the equipment continues to hum along for 639 or 1,000 or 10,000 years is an engineering project in itself and goes well beyond the normal planning for a composition, as Finer discovered. New alternatives to the use of computers in the presentation are still being considered – including a dedicated radio frequency and a strange mechanical setup involving six car-sized turntables with two playing arms each.

“I really don't want it take over my life,” Finer says. “It always demands something. In a sort of science fiction way, I feel like maybe I'm just the poor sucker that *Longplayer* used to get itself manifested. It spawned out of me like some weird alien form.”

The social aspect is, by itself, an enormous and ongoing challenge. How do you sustain a human organization for a thousand years? As a first step, Finer set up a charitable trust with a board made up of professionals with deliberately diverse specialties – fundraising, technology and events planning, for example – “whose responsibility it is to make *Longplayer* as widely and freely available as possible and to make sure it keeps playing.” Each generation will have to pick up that baton and run with it, changing it as needed so it can be carried to the next.

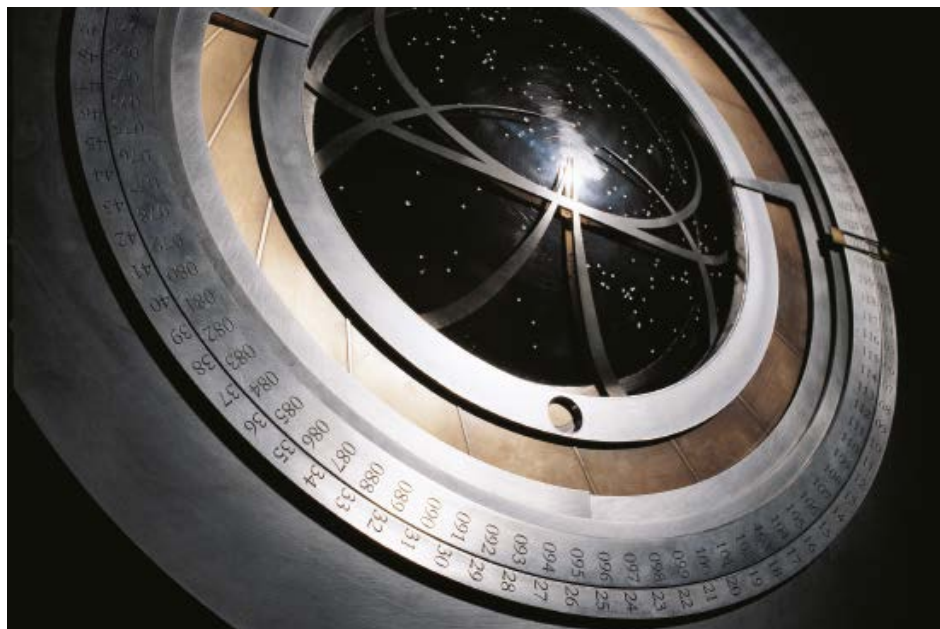
### THE NEW CHURCH

IN HALBERSTADT, SIMILARLY, THE JOHN CAGE Organ Project has set up a charitable foundation, of which Neugebauer is the current Chair. The choice of the church is a nod to the town's history. The building, originally Sankt Burchardi Church, was de-commissioned in the time of Napoleon and has served many functions since then, including, in different eras, as a brewery and a pigsty. World War II saw most of Halberstadt destroyed and with so much to rebuild, the ruined church was largely ignored and the site remained empty.

When the John Cage Organ Project began planning for a performance of *ASLSP* that would span centuries, musicologists identified the church as the site where the modern 12-note-per-octave keyboard was first used, on an organ built in 1361. The site appeared a poetic choice, harkening back to the past while projecting into the future.

The structure's original organ did not survive the centuries and the project's board initially thought to build a new organ specifically for the Cage piece. Four different designs were considered, but each time a cost barrier prevented the group from moving forward. In the end, the members decided to assemble just the number of organ pipes they will need for the notes being sounded into a playable instrument and augment those or replace them as needed. Sand bags hold down the levers that serve as keys. In this way, the instrument itself will continue to play while remaining in a constant state of evolution over 639 years.

That will require constant human involvement. To maintain the site requires about €50,000 (\$57,000) a year, Neugebauer says, which the group



draws mostly from tourist activities. Sponsors can earmark donations to support particular years and receive a plaque inside the church in their honor.

There will always be people, the group reasons, who are drawn to participating in something larger than themselves. Being a relic of a medieval church, the site lends its natural spiritual power to support the sense of a ritual being played out over centuries.

Cage may be more important as a philosopher than a composer, and is a pioneer of egolessness in art. His music and his philosophy ask listeners to rethink the role of the composer and the function of art. One particularly famous piece, *4'33"*, consists entirely of silence.

“Cage's idea was that he wanted an intentionless art,” Neugebauer says. “He wants nothing – no attempt at meaning – projected onto the art. The

The outside wheel on the face of the Long Now Foundation's 10,000-Year Clock shows years and decades, while the second wheel shows the centuries and millennia. The face also shows the sun, the phases of the moon and the apparent motion of the stars. The clock accounts for tiny variations in the length of an Earth day that, over 10,000 years, could otherwise throw measurements off by as much as a month.

music means nothing; it's only sound. That's a radical change from the way we perceive Beethoven or Mozart.

"We run into a little bit of a problem there, as our project is a little bit overloaded, you might say, with interpretations," Neugebauer says. "Just the church itself, the spiritual implications are very strong. Cage wasn't interested in that; he was more interested, toward the end of his life, in Zen."

Theologians will say the audience for the composition as a whole is God, Neugebauer says. But for Cage – and for himself and most of those who come to Halberstadt to listen – it's not God they are thinking about, but time, Neugebauer says. And that is a kind of blessing.

"We live in a time when we have no time," he says. "It's always 'hurry up!' But here, it's just this sound. You can listen for five minutes, 10 minutes, one hour, two hours. And it's like approaching a feeling of eternity.

"For us, the people who form the foundation," he adds, "it's made us very patient."

## LONG NOW

HILLIS AND BRAND SET UP THE LONG NOW Foundation, a US-based nonprofit that now oversees not just the 10,000 Year Clock but a number of other endeavors that call for long-term or large-scale thinking: the Rosetta Project, which collects and preserves languages on a single disc; and Revive and Restore, an effort to bring extinct species like the passenger pigeon back to life.

Established in the year 01996 (respectful of its long-term mission, the foundation uses five-digit dates for years), the nonprofit foundation currently has over \$8 million in assets and brings in over \$2 million in revenue. According to the Foundation's Executive Director Alexander Rose, funding initially came entirely through donations and patrons.

"When we started it was just my salary, a small amount of rent and some fabrication work," Rose says. "Now there are tens of employees and many people working on the Clock."

Long Now currently claims 8,482 members at five levels, from the "Stainless Steel" membership of \$96 a year to the "10,000 Year" level, which requires a one-time donation of \$10,000. In addition, it runs a café, The Interval, and sponsors a successful lecture series on long-term thinking.

"Membership is one of the main sources of revenue for Long Now that really 'keeps the lights

on,' as it is much more continuous than grants and donations, which tend to be very spikey," Rose says. "We have members at all levels."

The Foundation is a growing enterprise, which Rose describes as a "slow building startup." Yet he is mindful of the obstacles ahead, particularly in planning for unborn generations.

"Planning only works in the short term," Rose says. "We focus on making sure decisions we make give our future selves, and future generations, the most amount of options later. We trust that future decision makers will have better information than we do, and our job is to simply maximize the flexibility that they will have."

Handing the reins to the next generation of leadership will be the biggest test, Rose says. "The time between when we are old enough to be venerable, but still young enough to just be out of fashion seems to be where most things fail."

Founder Stewart Brand has a long history of forecasting. As a leading thinker behind the Silicon Valley tech revolution, he is credited with, among other things, being the first to coin the term "personal computer." Speaking on camera in *The Clock of the Long Now*, Brand says, "There's a problem of people not believing in the future. A long-term clock challenges those short-term civilizational stories."

## CODA

YET IT WOULD BE WRONG TO SUSPECT THAT THESE PROJECTS exist just as inspiration for today's entrepreneurs. They are more, too, than traditional jousts with immortality that merely try to preserve the present, such as a time capsule or a sarcophagus.

By contrast, the 10,000-Year Clock, *Longplayer* and the Halberstadt performance of *Organ2/ASLSP* are closer to living things, human processes that will continue to unfold, to generate new outcomes, for hundreds or thousands of years.

Future generations will observe and will listen, with ears tuned by the sounds of their own time, to musical patterns planned, composed and set in motion in ours. Framing vast distances of time, the projects create a corridor to a distant future.

Or perhaps more than a corridor: a dance floor, with us on one side and the people of tomorrow on the other. We move toward them, they toward us, to sway together in the darkness, in time with a slowly unfolding song. ■

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ALEXANDER ROSE,  
Executive Director,  
Long Now Foundation

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