

The Clock Of The Long Now Will Soon Keep Time For 10,000 Years In A Texas Cave

By [Matthew Battles](#)



Although a mere blink in the geologic timescales on which his imagination operates, it's been 15 long years since inventor and computer scientist Danny Hillis founded the [Long Now Foundation](#) [1] with a group of entrepreneurs, artists, and visionaries that included electronic music pioneer Brian Eno, digital-age savant Esther Dyson, and Whole-Earth impresario Stewart Brand. And now the group's work has taken a big tick forward with the breaking of ground for a "monument-scale" version of its central project, [the 10,000 Year Clock](#) [2]--a timekeeping device, an engineering masterpiece, and a kind of shrine--on a remote piece of mountaintop property owned by Amazon CEO Jeff Bezos in western Texas.

If it fulfills its promise, the clock will toll the hours in its limestone cavern in the Sierra Diablo range for 10,000 years to come. Powered by the slow action of its five-ton pendulum and an

ingenious correction mechanism calibrated by the sun, suspended in a shaft bored 500 feet into the living rock, the clock's 10 great chimes will sound a different melody every day for 10,000 years, some 3.5 million cycles of a Hillis-designed algorithm permuting a pattern of tones composed by Eno. Those tones will serve to remind us that while our lives may be short, time--and the planet--will continue apace. If we measure the far distant future, perhaps it will become more palpable, and we will plan for it better.

The question of a device that lasts for 10,000 years is one that few designers have considered; arguably, no one has answered it. Stonehenge, after all, is less than 5,000 years old--and while you can still use it to check the sunrise and sunset at the solstices, the site's functionality has degraded considerably. The engineering challenges of designing a mechanical computer that can operate for 10 millennia with little or no maintenance or oversight are as fiendish as they are fascinating, and Hillis and his engineer- and machinist-colleagues have come up with a host of solutions--building a massive digital computer using time-tested clockwork technologies like Geneva wheels and escapements, machining components from high-tech ceramics and alloys that offer a chance of surviving the clock's notional timescales.



The place where humans have come the closest to meeting the decamillennial mandate is no high-tech redoubt, but a site hauntingly similar to the planned home of Hillis' amazing clock: Chauvet Cave, the painted murals of which are featured in Werner Herzog's recent film, *Cave of Forgotten Dreams* [3]. Beginning some 32,000 years ago, artists brought forth their visions of horses, lions, and bulls in limestone caverns dotting the banks of the Ardeche River in southern France. As with murals at Lascaux, Altamira, and a host of other sites dating to the Paleolithic in Europe, humans marveled at--and added to--these works for thousands of years. Hillis hopes that future humans will express the same kind of relationship with his clock, treating it as a pilgrimage site, but also as a puzzle to be wondered at and toyed with; the clock's planned mountain home will include empty grottoes in which generations to come can add their own mechanical shrines to the clock's observation of the ages.

It's tempting to wonder what kind of technology transfer, from ultradurable machines to robust and productive algorithms, might emerge from the Long Now project. But its most fertile effects might not be felt for hundreds of generations to come. Did the artists of the Pleistocene ever pause in their shattered, torchlit grottoes to wonder whether others one day would ask what powerful but unrecorded race once dwelt in that annihilated place? In a recent essay [4] about the Long Now Clock, futurist Kevin Kelly turns that line of questioning around, quoting Jonas Salk's imprecation to ask ourselves, "are we being good ancestors?" Our species' best hope for surviving the long ringing of the changes likely lies in the questions the clock asks, and in the questions we bring to it as well.

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[Images: Top, Flickr user casey.marshall [6]. Bottom, Flickr user The Adventurous Eye [7]]

Links:

[1] <http://longnow.org/>

[2] <http://www.10000yearclock.net/>

[3] <http://www.youtube.com/watch?v=oZFP5HfJPTY>

[4] http://www.kk.org/thetechnium/archives/2011/06/the_clock_in_th.php

[5] <http://twitter.com/#!/MatthewBattles>

[6] <http://www.flickr.com/photos/rsdio/>

[7] <http://www.flickr.com/photos/theadventurouseye/>