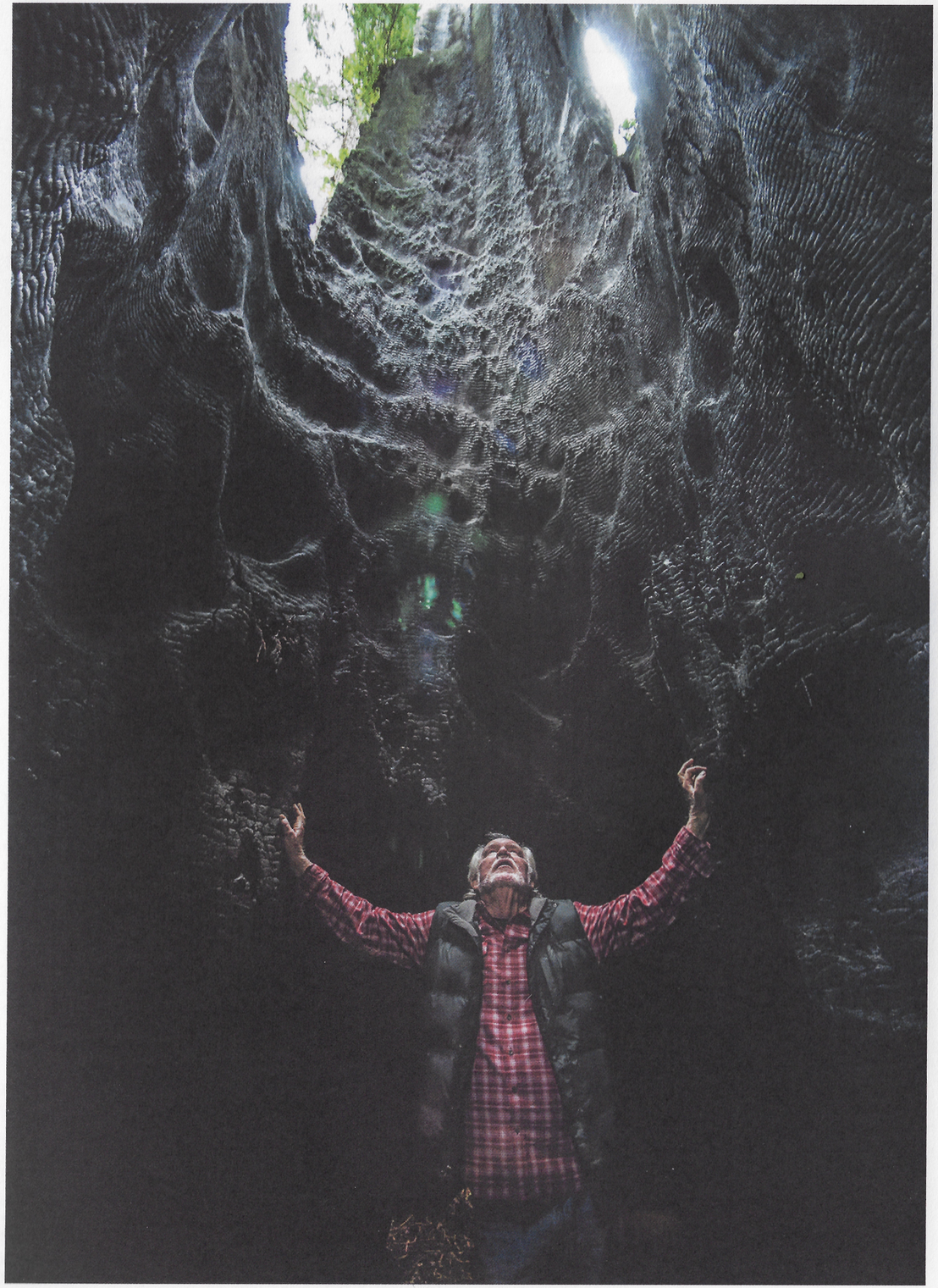

how to clone a forest

CALIFORNIA'S NATIVE TREES ARE AMONG THE OLDEST LIVING THINGS ON THE PLANET. DAVID MILARCH, TREE-CLONING EVANGELIST, PLANS TO KEEP THEM THAT WAY.

Writer Patrick Pittman

DAVID MILARCH HAS MASTERED THE TRICK OF TALKING WITH A CIGARETTE HANGING FROM THE CORNER OF HIS MOUTH – A USEFUL SKILL WHEN YOU NEVER STOP TALKING AND NEVER STOP SMOKING.

As the light of the low Michigan winter sun pours through his office blinds, he leans back in his chair, arms folded behind his head, explaining how he's the only man he knows who ever got kicked out of heaven. On the wall behind him, next to a printout of Stonehenge and the pencil-scratched heights of his grandchildren, is a poster – an unattributed proverb that's as succinct a mission statement as you might find for Milarch and the Archangel Ancient Tree Archive he founded:

A society grows great when old men plant trees whose shade they shall never sit in.

A less succinct way of putting it would be that Milarch and his volunteer army have been on a three-decade-long mission to discover some of the world's oldest and grandest trees – ancient and proud redwoods and sequoias – and save the hardiest of them by way of cloning. The goal is partly to reforest the Earth and partly to preserve the genetic heritage of its oldest giants. It's an optimistic project for the very long term, built in hope more than in protest. And it's one Milarch believes could help us avert certain disaster.

The day before Milarch and I meet, Archangel volunteers were busy carrying out this mission on the other side of the U.S. in San Francisco's Presidio park, planting 75 redwood saplings in the shadow of the Golden Gate Bridge. Each sapling had been cloned from one of five ancient northern Californian stumps: trees that would have been over a hundred metres tall had we not lopped them down for lumber. Thankfully, being lopped down didn't mean these trees were dead. Because as Milarch will later explain, it takes more than an axe to kill something that's outlived many empires.

In his own way, Milarch has also proven difficult to do away with. He has the imposing build of a man with several Viking incarnations in his past lives. Not averse to his own mythology, he'll happily tell you how he came up in Detroit, in street gangs, fist-fighting for money, living "in the world of violence and the world of shadows". He's still a brawler, and proud of it. But the target of his force changed in 1991, when he drank himself to clinical death and found his way, for a minute there, to the other side. "I died of total renal failure, which is a miserable way to go," he says. "Shut off your kidneys and your liver and in about three days, tell me how you're feeling."

Over on the other side he met the Archangel Michael, who he says is also here in the room with us now, along with Gabriel and a number of others, telling him what he needs to tell me. Milarch explains how the angels worked with him for eight years, teaching him about the mission they had for him: to use his experience as a third-generation nurseryman to inspire the world's return to its greenest, primeval state. (God, it turns out, is a greenie.)

With the fervour of someone who'd just cheated death, Milarch set about reforesting North America, plant by plant. Slowly, he came to realise that not any old seeds would do – after centuries of deforestation, most of the world's tree stock was weak. "We cut the best, leave the rest," he later told a TEDx audience. "And we've done that four or five times over, leaving only the junk of the junk of the junk." If we were going to combat something like climate change, he reasoned, there was not much point in asking the offspring of these weak trees to help. He needed to call on the strongest of the strong: the old giants.

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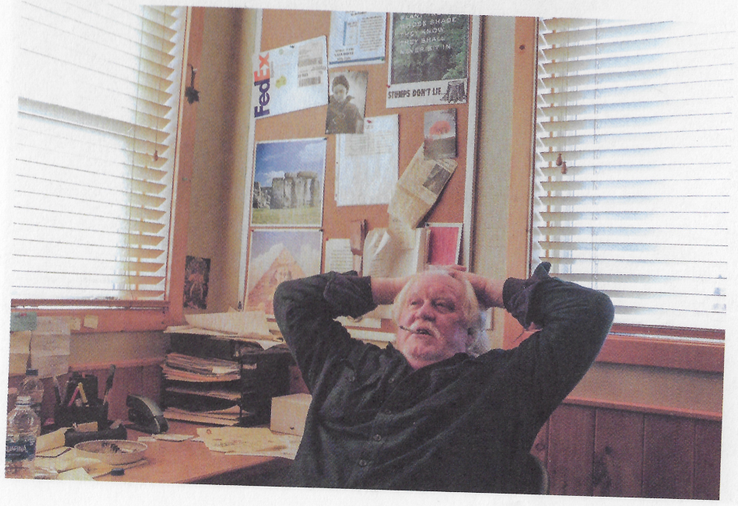

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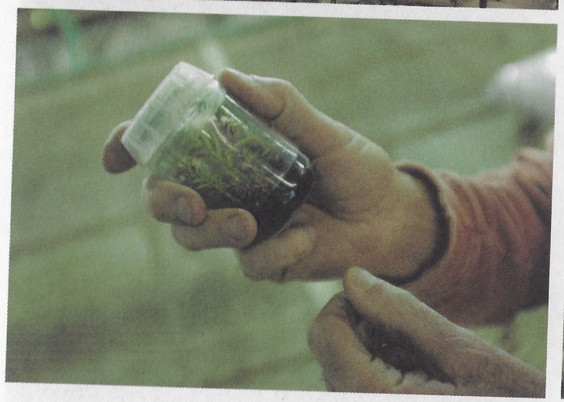
Milarch inside the burned-out core of a 1,500-year-old redwood, which he has since cloned. Photo: Michael Ramsey, The Story Group

Right
Filmmaker Michael Ramsey followed Milarch on one of his tree-sourcing expeditions for the short film Moving the Giants. *Photo: The Story Group*



Clockwise, from top
Ancient redwood and sequoia clones compete for space, light and heat in Archangel's crowded shed

One of thousands of cloned redwood saplings, ready for transplantation

Don Smith preserves a seedling in liquid suspension for multi-year storage. Photos: Patrick Pittman

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And so it was that Milarch and a small team of like-minded green thumbs set out to America's west coast to track down the oldest living trees they could find. They found plenty of contenders that were hundreds of years old, but Milarch wasn't satisfied. One day, the team stumbled on those five hollowed-out stumps. They were absolutely massive in size, and likely predated the Great Pyramids, but looked dead. The team was about to move on when Milarch noticed a ring of new growth about 10 metres out from each stump. He realised he was looking at a 'fairy ring' – a network of genetically identical saplings that sprout from an old tree's root system when it's about to die. Suddenly it dawned on him: genetically, these new shoots were as old as the stumps themselves. He'd found his giants.

With his two sons, Milarch took some cuttings from the fairy rings and flew them back to an old potato storage shed here in Copemish, the foresting village where the Milarch family has lived for six generations. They placed the samples in jars with hormones to help them multiply and doted on them tirelessly. Over the following years, Milarch estimates they've grown over 15,000 clones from those first ancient stumps. Many of these have since been planted in deforested Californian parklands. Recently, though, the focus has been on moving existing trees *out* of the state. To protect the old sequoias and redwoods from California's crippling drought, Milarch has sent his clones to Southern Oregon, where there is still enough fog and rain to nurture them. He calls this an assisted migration.

Cloning trees is relatively easy – cut off a branch, place it in water and watch as a new root system grows. But cloning an old tree is different. In fact, before Archangel embarked on this project, most scientists would have said it was impossible. "It's like asking a 115-year-old woman to bear a child," Milarch explains. "The whole world would say she's too old – almost all oaks that are cloned are less than 50 – so you have to break new science to do it." And break new science they did: over the proceeding decades, Archangel has successfully cloned a 3000-year-old sequoia – the first of its kind.

Achieving this requires a mix of knowledge and skill: cloning from fairy rings is one thing, but taking samples from living trees means climbing to the highest branches at just the right time of year. It's tiring work, both emotionally and physically. "You have to live and breathe this project," Milarch says. "Trying to nurture something that's never been done before in the history of the world is a big responsibility." It also requires a thick skin. "Every expert worth two cents says you're crazy," he says. "That you're a bunch of hillbillies from a poor little town in northern Michigan." Thankfully, in Copemish, thick skin is not hard to come by.

While mainstream science doesn't yet seem persuaded that older genes make for better trees, Milarch has his supporters. There are those who are simply enamoured with the idea of building an ark of ancient trees, and others still who believe these genetic records could one day prove useful should a tragedy ever befall those trees in the wild. Sir Tim Smit, founder of the Eden Project in the U.K., admires Milarch's determination. "Most environmental arguments about the state of the world are couched in *technology will save us* language," he explains. "Which has always proved to be wrong. But David is simply saying that if we planted more trees than we were cutting down, *it's a start*."

Back in Copemish, out in Milarch's old potato shed, I find Archangel volunteer Don Smith tending to a batch of saplings. Industrial fans, heaters and sunlamps keep everything as close to a Californian climate as you can get in Michigan in winter. Smith shows me how the team is creating a suspension for the tiny clones that will allow them to be shipped anywhere around the world, and preserved for years before planting. I ask him whether it's really a good idea to take these trees and propagate them in places they aren't meant to go. "If it's going to save the species, why the hell *aren't* we doing it?" he asks back. "Just about every tree you can imagine is dying right now. You can't put a bell jar over a forest."

Ever restless, Milarch isn't content with shifting a Californian forest the next state over, one clone at a time. "Every day I sit in my office, and I look at a map of the world and check off the countries we need to go to," he explains. "There are 100 species of trees on that map. If we don't clone those and get them back in the ground by the millions, life as we know it for humans will be over in 50 years." To avoid this, Milarch plans to build other growing facilities in Europe and New Zealand. He also hopes to visit Australia in 2019, to clone some of the ancient giants of the south.

Based on these plans, the future sounds positive. Still, there are road bumps. Milarch tells me how he and his sons haven't taken a paycheque from Archangel for years. For a little while there were significant donors, and attention from a book and coverage in coastal newspapers. But right now, times are tight. There may be a TV series coming. Occasional media attention from events like the Presidio planting. But if you were to survey social media or look at where investors are putting their money, plans to jettison Earth and head to Mars seem more popular.

This might depress someone less up for the brawl, though Milarch is convinced something will come along. It always does, he says, if you persist. "I have a cast-fucking-iron will. It's a metal stake in frozen ground. You cannot move it." And just like an old redwood, you cannot kill it either. •