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## Civilization Has Lasted 5,000 Years. How About 5 Million?, Scholars Ask.



Jay Premack for The Chronicle

David Grinspoon, an astrobiologist at the Library of Congress's John W. Kluge Center, lured a panel of luminaries to wrestle with a loaded question: "Will we survive our world-changing technologies?"

By Paul Voosen

Washington

This town is not known for its long-term thinking. But on a recent humid day at the Library of Congress, a collection of astronomers, humanists, and writers set their eyes on a deadline well past the next debt showdown, or even the next election.

They had a more distant horizon in mind. They had gathered in this 213-year-old institution to debate whether human civilization, which has had a good run over the past 5,000 years, could persist for longer than a geological blip in the Earth's 4.5-billion-year history.

"The rules that determine what happens to the planet" have changed, said David Grinspoon, the day's host and the inaugural chair of astrobiology at the Library of Congress's John W. Kluge Center. "We ourselves occupy a strange niche in this perturbed world because we're at this point where we have a huge global influence, but we can't really claim to have global control."

Mr. Grinspoon, a planetary scientist previously at the Denver Museum of Nature & Science, had lured a panel of luminaries to wrestle with a loaded question: "Will we survive our world-changing technologies?"

It's a pessimistic question, he allowed. Technology is not an inherent evil or good. It has saved lives, and could save more, perhaps by intercepting an asteroid. After all, Mr. Grinspoon said, "The dinosaurs did not have a space program." But since the advent of the steam engine, the biophysical demands human beings have placed on the planet through technology have grown exponentially, as seen most clearly in the global warming stemming from human carbon emissions.

## A Civilizational Lifeboat

What to do about it? One option is to spread the risk around by getting the heck off the planet. NASA has long been enamored with the dreams of Wernher von Braun, the German rocket scientist who proposed, in 1952, a paradigm that bears his name: Space shuttle leads to space station leads to the Moon leads to Mars.

Inside NASA, a serious reason for such a trip is the survival of human civilization, said Steven J. Dick, the agency's former chief historian.

In the event of cataclysm, let's "get at least a small group of us off the planet so we don't have to start from scratch," Mr. Dick said. The spectacular meteor that detonated over Russia this year is a reminder that large things do indeed hit the planet. Be prepared.

Humanity is in a risky bottleneck, added Seth Shostak, senior astronomer at the Search for Extraterrestrial Intelligence Institute. Technology has allowed us to explode in numbers, but we're all pinned together on this planet. Once we start colonizing space—Mr. Shostak has in mind "floating cans" in Earth orbit—then civilization will be fine.

The civilizational lifeboat is a dubious justification for space travel, countered Kim Stanley Robinson, a science-fiction novelist best known for his Mars Trilogy. After all, "we are creatures of Earth," he said. People play host to teeming ecosystems of microbes; much of the DNA in our bodies is not our own.

"We may be so ecologically tied to this planet" that space is too alien, and "we cannot survive except temporarily in little bubbles of protection," he said.

That's not to say that space travel isn't worthwhile. "The stars are out of reach," he said, but we should go to Mars. "Not because it saves us from extinction. It's because it just helps us to do better. It's a project of human interest and beauty."

## 'Stuck in History'

During a day given to ungrounded prediction, Mr. Robinson emerged as a hard-headed realist, grounded in existing human institutions, like the legal system. Justice is a technology, he said. When women have equal rights, the birthrate plummets; population growth, which imperils human existence, "is solved by justice." And he had little patience when several panelists endorsed the "singularity"—the hypothetical moment (he called it the "nerd rapture") when computers pass human beings in intelligence.

"This is a terrible misreading of brains, of computers, of history, all at once," Mr. Robinson said. "We have to acknowledge that we're stuck in history and we need to make do," he added. "So that really the story of today has to be: Can we adapt our economic system to climate change?"

The most dour assessment of humanity's ability to tackle global warming came from Ken Caldeira, a climate scientist at the Carnegie Institution for Science. "Our psychological structure is no longer adapted to the world that we create," he said. As a species, we're hard-wired to pay more attention to, say, the kitten with an injured paw in front of us than to starvation a continent away.

Global warming is the most-pressing example of our failure to deal with the implications of our technology, the panelists generally agreed. But surprisingly, it is not the most dire threat to civilization, they said.

"I'm more likely to be killed by a nuclear weapon than by climate change," Mr. Caldeira said. "And probably more likely to get killed by some virus than by climate change."

### 'The Great Silence'

As a species, people are adaptable. There's hope to take from the past. Once it was thought that human beings evolved to dominate the climatically stable grassland savannahs of Africa. Two decades of research have shown, however, that there was no stable environment during humanity's emergence from the trees, said Rick Potts, the curator of anthropology at the National Museum of Natural History.

"The difference between humans today and our extinct immediate relatives, in the evolutionary sense, is that our basic adaptations rely so heavily on modifying the surroundings," Mr. Potts said. "Altering our surroundings is our mode of survival."

There was much talk of the Anthropocene, the idea that the world has entered a new geological epoch dominated by humanity. It's become a shorthand, a way to end the notion that nature is something pristine, that happens "over there," apart from people, said Ursula K. Heise, an English professor at the University of California at Los Angeles.

"That's completely true, and I agree with that, but that's news really only to North American environmentalists," she said. It was part of a trend in the day, where a bunch of Americans felt free to speak for all of humanity's future.

In the end, there was no answer to Mr. Grinspoon's question, of course. The answer will be in the doing. But given that this was a day held under the auspices of astrobiology, talk naturally turned back to life beyond our planet. We've been listening mightily for decades, and yet have had no sign of intelligence out there. Mr. Dick, the former NASA historian, said that raised an ominous prospect.

"Civilizations on Earth have survived in one form or another for about 5,000 years," he said. "Perhaps the great silence from outer space indicates that civilizations don't survive much more than that."

Perhaps. But some parts of civilization will. Which is why it seemed appropriate that, at the same time the panel met, NASA had some news to report: The spacecraft Voyager 1, launched in 1977 and bearing a golden record of our civilization, had finally entered interstellar space.

We might never reach the stars, but Voyager was on its way.