

Eternity and Imperfection



[Opening theme music.]

Joel McKinnon

Back to a New Year on Seldon Crisis, but alas, not yet the beginning of season three. For various reasons, we're it's not quite ready to plunge in, but preparations are being made to begin that wonderful adventure. Instead, I've got a little essay for you. A couple of threads are woven into the title I've chosen, "Eternity and Imperfection." One was a quote found in, of all places, a Google doodle. That is, the little custom designed rectangle on the Google search page, which varies to celebrate special days on the calendar. The day I'm writing this happens to be the 80th birthday of the late theoretical physicist Stephen Hawking.

Joel

If you click on the doodle, it plays a short cartoon video showing some of the events of Hawking's life and narrated in his iconic computer assisted voice. One quote I found inspiring was "One of the basic rules of the universe is that nothing is perfect. Without imperfection, neither you or I would exist."

He's referring to the fact that all of the matter in the universe, including the stars that gave birth to the substances that eventually led to life on Earth, arose from imperfections in the great expanding energy field that resulted from the Big Bang fourteen and a half billion years ago.

Another strong thread that contributes to the ideas I'm about to discuss comes from my recent reading for the first time of Isaac Asimov's brilliant time travel masterpiece, "The End of Eternity." This novel was the last standalone science fiction novel written by Asimov before he took a long break from Sci-Fi from the late 50s until the early seventies and produced another masterpiece, "The Gods Themselves." If any of my listeners have not read The End of Eternity, I ask you to stop listening now. Because like anything by Asimov, there is great joy to be found in the surprise twists and turns in the plot.

And I will not be able to avoid spoilers in the discussion of a particularly powerful idea in the story that occurs quite near the end. I'll start with a recap of the insanely imaginative plot. The protagonist we meet early in the story, Andrew Harlan, is one of those brilliant geniuses Asimov likes to have stand in for himself. But Harlan has certain character traits I found unusual, and which Asimov would likely not like to claim for himself. He is a largely humorless man, extremely driven by his ideals and prone to outbursts of anger and neurotic energy. He is ambitious not for money or power, but for a high level of excellence in his work, and becomes furious at those who stand in his way.

Harlan was born in a century several millennia in our future, but exactly when is not important, as he spends no time at all there during the course of the novel. He was recruited from his birth century by the Eternals, a group that exists outside of time and space. As we know it and has the capacity of traveling up when forwards and down when backwards through time at will. Their job is to manage the events that occur throughout the timeline, which could jeopardize the human condition and keep it optimally happy and healthy. They do so by traveling to various centuries and introducing the smallest changes possible to keep the progression of humanity on track.

One of the ideas I like is that the propagation of change has inertia. That is, when a change is introduced, its effects gradually die out over time. As long as it's a small enough change, a major change, as we will see, can have very big and permanent consequences. Harlan rises quickly to the role of technician. It's his job to implement these minor reality changes, and he travels extensively up when and down when on assignment by his superiors. On one such assignment to the two 456th century, he meets a beautiful aristocrat named Noÿs and falls in love with her.

He understands that the necessary change he must introduce to her century will fundamentally change or possibly even eliminate her from existence. He breaks a fundamental law of the Eternals by taking her from her century and hiding her in a distant future part of Eternity where even the Eternals are inexplicably barred from entering time. When Harlan later travels "upwhen" all the way to the century where he had hidden Noÿs, he is stunned to discover a mysterious block along the way at level 100,000. This sends Harlan into a rage that he pretty much remains in for the rest of the book.

Things get a little too complicated to recount through this section, but it ends with a return by Harlan and Noÿs to the year 1932, where Harlan will attempt the greatest reality change of all, one required to save Eternity from never having been created in the first place. Again, I don't want to spoil it for anyone who might not have yet read the book, so please stop here if you are among them. I'm about to describe the biggest reveal at the end of the book and some thoughts it has sparked in me upon reading it.

In a cave on the planet Earth in the early 20th century, Harlan pulls a blaster on his beloved Noÿs. He has become convinced that she is an agent of future beings inhabiting levels of time far beyond the reach of the Eternals, and that she has orchestrated his every move throughout the story, including the act of seducing him. He comes very close to closing the contact on his blaster and obliterating her forever, but pauses to allow

her to make her last defense. To "Postpone the moment when he must look down upon her blasted body, upon whatever bloody flesh might remain, and know that what had been done to his beautiful Noise had been done by his own hand." Noÿs answers his accusations in the affirmative.

She is indeed from the far distant future of humanity. But she has compelling reasons for her actions. She has concluded that the Eternals, while attempting to maximize the happiness of all humans throughout time, have accomplished something significantly worse. They have created a future in which humanity is not challenged and no longer evolves. Under the threat of her imminent death by blaster fire, Noÿs calmly states her chief objection to the project of the Eternals.

"In ironing out the disasters of reality, Eternity rules out the triumphs as well. It is in meeting the great tests that mankind can most successfully rise to great heights. Out of danger and restless insecurity comes the force that pushes mankind to newer and loftier conquests. Can you understand that? Can you understand that in averting the pitfalls that beset man, Eternity prevents men from finding their own bitter and better solutions, the real solutions that come from conquering difficulty, not avoiding it?"

Noÿs further explains that in the reality that she and Harlan currently inhabit, space travel had become a rare pursuit, accomplished to a small and unsustainable level in a few scattered centuries and then always abandoned. While mankind stagnated and remained Earthbound over the course of thousands of millennia, other intelligent species grew strong and laid their exclusive claim to the galaxy.

In an interesting allusion to the universe we know of in *Foundation* and other books by Asimov set in humanity's distant future, she suggests that if humanity had never indulged in the self limiting development of Eternity, they might have broken out and created a galactic empire of their own. In the end, Noise's argument spares her life and causes Harlan to make

the fateful decision to change the course of future history from that point forward and let all of the people and the life he has always known never come into existence. In the final words of the novel, Asimov describes the result of the drastic change in the course of history, Harlan has initiated as "the end of Eternity and the beginning of Infinity."

The implication is that it is this new reality that goes on to become a universe, eventually to become the playground of galactic emperors, and in only twenty millennia, a mere blink of an eye in the magnificent scope of this novel, the emergence of Hari Seldon and Foundation. I've described the two sources of inspiration for this essay being the Hawking quote on the essential nature of imperfection and the theme and conclusion of this great novel. There is actually a third. And it is a long running debate I've held with one of the listeners to this podcast, who never tires of telling me that the best and only reasonable way for humanity to proceed outward into the galaxy is through the development of rotating space habitats and that such side adventures as colonizing planets like Mars amount to nothing more than planetary chauvinism.

This argument comes down to a basic mathematical analysis of energy budgets. Once we are capable of establishing a sustained presence in space, the optimal way for humanity to expand and eventually reach the stars is to maximize our utilization of solar energy by creating what are known as Dyson Swarms, named for the great futurist Freeman Dyson. A huge number of space settlements in orbit around the sun placed in such a configuration as to harvest all of the energy it releases. This will power our further expansion into deep space where we will be able to continue this process with each star we reach until we have eventually succeeded in Dysoning the entire galaxy and then go further to neighboring galaxies.

To me, there is something barren and unsettling in this vision. In some ways, it reminds me of the mission plan of the Eternals. That the best way of maximizing happiness for all humans was to continually groom

the centuries throughout inhabited time for their benefit. But Asimov has explained the problem in this. If humans always have everything they need just the way they want it, be in the form of carefully groomed cultures managed by time traveling Eternals or by a master plan of optimal energy utilization in an ever expanding bubble of happily contained humanity in their perfect space habitats. The end result is the same humanity will have no adaptive necessity and will stop evolving.

We will be like the sharks that have roamed the seas for millions of years because they are perfectly adapted to an environment that never challenged them to evolve further. This is one of the main reasons I am drawn to the admittedly more challenging prospect of making planets livable for humanity even if it takes thousands of years to do so. Consider a colony on Mars as a hypothetical example. The initial conditions of such an environment for human habitation are decidedly sub-optimal. Deadly radiation at the surface, brutal cold, no protection from asteroid impacts, super fine dust everywhere, and that little problem of no air to breathe.

Many of these obstacles could be quickly overcome by living beneath the surface while projects would be launched to create orbiting magnetic shields and various means of thickening the atmosphere such as generation and dispersion of greenhouse gases. After a few hundred years, it might be possible to routinely spend time on the surface in appropriate protective clothing including portable air tanks for breathing. Eventually, plant life would become possible which would generate oxygen to further improve the atmosphere and also to feed the colonists. It would be a long, hard road but eventually such a colony could become self sustaining.

But what about the gravity? Humans have evolved for millennia with Earth's gravity and we don't even know if humans can live sustainably at the 0.38G found on the Martian surface. Why take such a chance investing such a colossal amount of energy when we don't even know if this is even remotely possible? We have the technology to start building

beautiful rotating space settlements today with a perfect simulation of Earth's gravity and an atmosphere entirely to our liking. In a drastically reduced time frame, humans could have a perfect habitat, which could be the first of a countless number where no one would ever fear sickness, misery, or premature death.

Let's do that, but let's not only do that. Planets like Mars may or may not be livable in the long term, but the very effort of attempting to adapt to the conditions they force upon us will very likely spark adaptations in our genome, and we will begin to differentiate into entirely new forms of life. Eventually, the Solar System could be home to many branches of human evolution. Some may die out quickly, but others may demonstrate new characteristics that make them much more suitable for deep space adventures, such as the generations long missions to reach other stars and find yet more habitable environments that will continue to force our evolution in unknown ways.

The intelligent beings that eventually inhabit the galaxy might vary dramatically, but all would be descendants of Homo Sapiens. Our distant ancestors once inhabited a single continent on this planet, and environmental challenges drove them to adapt to their new conditions. Many branches of the family tree withered and died, but a few eventually broke out into new continents, where they faced a variety of climatic conditions that pushed them in all sorts of ways. For a time, there may have been half a dozen species of hominids spread across the globe, until one species proved to be the most capable of mastering its environment.

By developing capabilities like language and technologies to make use of fire and to create weapons and strategies for harvesting the abundance of plant and animal life to be found for their sustenance to touch. On Hawking's point again, it was the imperfections we found in our environment that drove us to become more capable and vastly more intelligent beings. We shouldn't strive for a future in which there are no

longer imperfections to challenge us. If we would succeed at this dubious course, we would be a plentiful but frozen relic of a once vibrant life form. Instead, we should continually test our limits, as the ancients did in attempting to inhabit dangerous and unhealthy environments.

I've been a member of the Mars Society, a worldwide group in support of human settlement of that planet for more than two decades, but I am much less involved than I once was. I'm inclined to redouble my efforts to push for human settlement of the red planet because we're getting much closer to that becoming a reality, and it seems we need all hands on deck to advocate for the vision. One very common critique we've always faced in this effort is the argument that we should put all of our attention on Earth's growing environmental crises and other pressing issues currently besetting our species.

The assumption is often made that those like me who are excited about the prospects of inhabiting Mars and other worlds are giving up on this planet. There is no Planet B. They say this implies that the choice is A or B, where I see it as A and B and C, D, etc. We can walk and chew gum at the same time. Another common argument is that we must first resolve our inequalities and injustices, or else the capitalists, like Bezos and Musk, will reap the rewards and start us off on the wrong foot on our extraplanetary adventures.

The fear is that they will follow the traditional path of human nature and become tyrants and oppressors. This is a danger of which we should always be cognizant. But I don't believe we have the luxury of making our perfect society here on Earth before looking outward for space bound adventures. This is another form of seeking perfection and could end with humanity's stultification in a contented but unchallenged reality. Improvements in governance and society will always be a work in progress here on Earth and in our future space habitations. Meanwhile, please continue to tend to planet A and do everything you can to raise awareness

of the challenges we face in keeping this fragile home planet in a habitable state.

I believe there is an unappreciated synchrony in efforts on behalf of this world and the future ones we are destined to inhabit as well. And yes, we will inhabit them and we will evolve there. As dear Isaac said, we are only at the beginning of Infinity. If you're intrigued by my arguments in this essay or would like to refute them passionately, I would love to engage in further discussion of these topics, and I urge you to reach out by email at joel@seldoncrisis.net or on Twitter @JoelGMcKinnon. By the way, you're really going to want to check out the show notes for this episode. I intend to put in links to an excellent NPR review of End of Eternity that includes a brief excerpt, and a link to the Wikipedia page that has an excellent plot summary and some really cool background info on Asimov's inspiration for the story. I'll also link to the Stephen Hawking Google Doodle video where I found the imperfection quote. It's quite charming. I'll have links to a couple of essays representing both sides of the planets versus space settlements debate and a link to the webpage for the Mars Society so you can learn more about their efforts and how you can get involved if you are so inclined.

Our next episode will mark the long awaited beginning of season three of Seldon Crisis. We will return to the story of the beleaguered Foundation suffering under the yoke of the Mule while he undertakes the cataclysmic effort of finding and destroying the Second Foundation. Join me next time for "Search by the Mule" here on Seldon Crisis.

[Closing theme music]

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Shriya

Hello.

Julia

We're Shriya and Julia from the Id, Ego and Us podcast.

Shriya

We're two high schoolers releasing weekly episodes.

Julia

Containing four topics each, but don't be fooled by the name. We discuss anything and everything you can think of, from philosophical questions to true crime, and many more.

Shriya

As we take on more difficult courses in school like AP World History, AP Computer Science and Forensic Science and Criminalistics, we always make an effort to add those ideas into the recordings.

Julia

In one of our latest episodes, we talked about Elon Musk's upbringing and the murder of Polly Class before closing off with the Food for Thought, which is a philosophical segment and a Would You Rather segment.

Shriya

Episodes are 20 to 30 minutes long and release every Sunday on Apple Podcasts, Spotify, Good Pods, Amazon Music, Google Podcasts, Podchaser and more.

Julia

It would mean so much to us if you would listen to our growing project. All our socials are linked under Id, Ego, and Us. That is i d e g o a n d u s. No spaces and no caps. If you'd like to listen, we run the majority of our announcements through Twitter and all of our platforms are linked over there. Thank you so much.