

“The Yawning Grave: Sleepless Nights and Astrophysical Lights”
Lindsay DeMarchi

After billions of years shouting and burning into the vacuum of space, a star dies— sometimes in a violent bang, sometimes in a whisper (Lamers 17). In a matter of milliseconds, a body of ungodly hellfire entombs itself with inescapable compactness and insurmountable weight. Here, gravity reigns supreme— above light, magnetism, and the very forces that hold atoms together. A star’s own gravitational pull draws and warps a pit in the fabric of space and time, the swirling descent of a selfish psychopomp timekeeping eternity — for it is entering its final, inescapable form (Hartle 21). Some may argue that calling these new stars “corpses,” is in fact incorrect or a bit too harsh; rather, they are beginning a new stage of life. Their new bodies, under the rule of gravity, compress titanic masses several times the size of our sun to the size of Chicago as a “neutron star,” or to a black hole singularity smaller than this full stop: .

(Hartle 21)

To an external observer, a supernova is a stunning occasion of complete self-immolation, wherein furnaces that once melded carbon, oxygen, and helium explode across planetary systems. In the destruction, heavier elements are born that later constitute bodies like our own and the world we know, such as platinum, gold, nickel, and calcium (Lamers 17). We are star dust; and from the beginning, we are the shrapnel of death.

In this way of recycling elements, the universe is kneading, baking, devouring, defecating, and every few billion years that cycle begins all over again in the birth of a new star. Like the decomposition of a body in soil, stars too change form by shattering and rebuilding into humans, planets, more stars, and even disperse nothingness. The cycle restarts, the cycle perpetuates— and yet, we all know, there must be some kind of definitive end.

But when could that end be?

Is it better to ask the more immediate question, when does it end for us observers? Is it in a few decades, when global warming turns our generous Earth volatile? Even if we manage to survive, is the End postponed 5.5 billion years to when the sun reaches its maturity, expanding and swallowing our planet within its gaseous might (Lamers 17)? What if we are unable to outrun our fate, and we must instead face the fact an End does definitively exist? An End where all we see here on Earth becomes ash and sublimation, when consciousness itself dies, when the universe doesn't look on itself in names and laughter, but in reflecting flecks of dust and debris, touching for a moment to change trajectories.

Do we become new bodies, molten forms in space? Perhaps this is something the departed already intimately digested with their taste of the unconscious. I can't help but wonder if this grand plan, the mystery of death, has been revealed to them within the ambient liminal space of "nonexistence."

The Astronomer catalogs a star's dirge and carves its epitaph. A camera located on Proxima Centauri, our closest stellar neighbor (Kervella 19), takes a photo of Earth. But what it registers is the Earth as it was four years ago, because light from our planet traveled four years to reach its lens. Photonic images such as these, suspended in time, constitute a view unique to those at vast distances. An omniscient being would instead note the seething cinders of an explosion long since passed as we merely register its birth. The information we record in our lonely corner is an interrupted snapshot of the past that only exists in the space in-between objects. The galaxies in our deep space images may be long since dead, but confirming it would require waiting millions of years for that information to touch us.

The miraculous coincidence of this photonic encounter compounds when you consider that for space to witness *any* of itself, the Earth first had to cool from molten clay, tectonically divide its sole continent, accidentally mutate opposable thumbs, witness purposeful creations of fire, and endure the evolution of modern society. All builds in a fateful crescendo such that an Astronomer looks through her glass at precisely the right instant to meet the arrival of a star's final exhale as it passes through empty space.

What happens to the inhabitants nurtured by a star that bursts? What happens to those of us not immediately incorporated into the afterlife of its new body? To those of us not in the "inner circle" of the new black hole event horizon, or those of us not smashed down to the size of a city in the company of our nearby planets swallowed whole?

What about those of us instead propelled by the outer edges of the explosion, strewn far into space, where we are noninteracting, inert, and cold. Thousands of fragments of our own identity, our humanity, impossible to reconstruct, spread so thin over space that our collective history is rendered anonymous. We lose all knowledge of our limbs and of our extent in nameless dust.

The universe is constantly expanding its dark, inky vacuum at 262,800 kilometers per hour, a rate that is increasing all the while (Liddle 00). Though there are several hundred billion galaxies in space (Lauer 21), the emptiness we belong to holds our local cluster of galaxies at an arms' length of about a million light years apart (Frank 20). An exchange of congenial "hellos" between neighboring galaxies would take an average of two million years to complete.

We are touching nothing, sailing in dark emptiness to never interact again, until the rest of the universe joins our cold sorrow in the end of all its cycles, in its entropic heat death (Pathria

11). When every fiber, every molecule, every atom spreads so far apart from one another the entire plane of existence relaxes into all that is: silence. There is no temperature. There is no form.

Yet we humans still rebel. There must be something for us particles. There must be something, somewhere, that can hear us. That we can touch. There cannot be loneliness, not when the life and reality I've come to know is one warmed in constant tides of love.

Searching through the unseen, feeling our way through the recycled energy of celestial souls, our begging hands are steeped in spiritual ectoplasm. The Astronomer tabulates the details of an entity before time advances the cycle. The Poet desperately captures its negative space and the absence surrounding. The Necromancer recognizes the scene as a Möebius strip and rejects individual cycles for a true understanding of the encompassing eternity.

Considering the dark and uncertain abyss of the afterlife is a common exercise for sentient members of Nature's gambit. But still we naively wish to separate ourselves from fate with conviction, ignoring the 107 billion people who lived and died before us (Roser 22), like children who announce that they will never get old. We want to believe the human form we are attached to is immortal, that information of our legacy is timeless, all while we turn a blind eye to the gargantuan reptiles that once dominated this Earth before us and now roar in our engines. We reassure ourselves with an intuitive, instinctual knowledge that something must take place after death. Eternal life must thrive on.

Perhaps the sense of an immortal soul is a maintained conviction, like a long-lost memory, because our own matter *is* immortal, even though it's always changing forms. When you, and I, the animals, and stars, were all in singularity before the Big Bang, a multitude of twins in a universal embryo, we were a single point. After the universe expanded and cooled, the marrow of our bones originated in the cores of stars more ancient than our sun. Our nails, our

hair, our blood, are all from the times we have died before as stars, planets, and other human bodies (Lamers 17).

And so, the tradition of necromancy sparks like an electric current through the dark quiet, a salve on our existentially wounded egos. Communicating to the dead becomes equally as important as the dead communicating to us. Just like our shared impetus to scry from the deepest recesses of space, we humans crave the knowledge of what's happening "beyond" so that we can turn it over in our minds and accept it. Because it's imminent.

"Please tell me, as that spec of dust in the cold and vast, that you are not lonely."

"Please tell me, as a fragment of what I love, that you are actually okay."

"Please tell me that in some way, you are at peace, that you are happy, that you are fulfilled in your new role, and that your needs are not what they would be if you still had my form."

"Please tell me your new needs are something attainable, and you are not in a constant state of yearning, of emptiness, of silence that you cannot break."

Necromancy reaches to the world of the dead for life, just as Astronomy reaches to darkness of space for light.

And what about when the dead do speak to us? What is happening in that instant we are forced into the realization that our everyday experience is shattered, and we cannot reassemble the pieces in a way that blinds us again? What happens when we feel that organ of intuition lurch from our bodies in a way that first declares "I **know**," before our minds can reorganize cause and effect?

It is discovery in its purest sense, the universe giggling from behind her veil, but it is also an addictive, deep, peace that all our fears are for naught. We are seen. We are loved. There guides something outside our knowledge. Perhaps this something knows what this assembly of

particles is for. Perhaps we are all irreplaceable, precious pieces of a large, finite collection of a great and artful being. The only way to know, for both the Astronomer and the Necromancer, is simply to listen. Listen to the rise and fall of a star's twinkling like wind chimes in a passing breeze. Listen for love trilling the subtle body like a visitor in a spider's web. Listen for the impulses, for ripples in spacetime, for inspiration, for the undercurrent of intuition. For you to read this, now, 14 billion years of continuous coincidences had to take place in recesses of the universe we cannot yet observe (Frank 20). At the end of an improbable chain, the moment in which you find yourself is deeply auspicious. At the other side of that chain, at the very start, before the Big Bang, all the universe was one, in contact with itself. All that "is" is inherently a part of you, as you are a part of it, distant cousins across light years. A crucial lesson for both the Astronomer and the Necromancer is that the dead are always about us. It is the notion of "separateness" that must be held under scrutiny.

When the sun sets and the sky re-darkens, a realization of familiarity washes over you. You recognize that these speckles of light had, in fact, been watching you all throughout the day — which you certainly knew but had not kept present in your mind. You have been in the arms of enormous parents, even if the flashing distractions of the day led you to forget. And when the sky winks in a meteor, the sun bears its might in an eclipse, or when a supernova rivals the brightness of a galaxy, the shadow of what you had forgotten is dwarfed by the torch of remembering: this is what you are from. You burn to rejoin that conversation.

You feel, in the sky and in the pit of your stomach, a birthright to the cosmos, in tension with how inconsequential you are, how small in size and scale, such that you cannot immediately touch the stars, and you cannot immediately reach back to what has reached out to you. This is the search of the Necromancer. This is the sublime greed of human consciousness. To seize the

instant of intuition, to imbibe the unknown as it lingers in the middle distance, to incorporate it back into the self, and to hold it near again where it should flee. The Necromancer remembers that this sensation is what Truth feels like. The Necromancer, the Medium, the Soothsayer rejects the disparate sinking parts of finality and separateness, instead weaving them together again, stringing particles and symbols and signs and syllables with tendrils beyond our mastered senses, laughing in the eyes of permanence and linearity.

The pursuit of Necromancy is rebellion against existential anguish and a direct connection to the beyond. The Necromancer unites the pieces of what we were with what we become, unburdened by the illusion of corporeal limitation, secure in the memory of our grand togetherness in the primordial cosmic bath. The trade of the Necromancer is the passage of that knowledge, once outside of ourselves, through the human form and cast on the stage of the human experience, all with a subtle eye on its true multidimensional shape.

I invite you, with me, in the very short time we have, to consider the realm of the dead as not so distant, not so out of reach. That we, whatever we are, are all made of the same. And I invite you to find peace in the idea that when we are strewn asunder, like grains of sand across a vast cosmic beach, that we will, in our own way new to us, continue to comprise whatever strange, mysterious universe we make up today.

Does anyone remember what it was like to be a star? Or to be dead? We might get to do it again.

All of us, together.

References

- Antón, Susan C., 'Natural history of *Homo erectus*', *American Journal of Physical Anthropology*, Vol. 122, (December 2003), pp. 126—170
- Frank, Adam, *At Play in the Cosmos*, New York; New York: W. W. Norton & Company, 2020
- Hartle, James, *Gravity: An Introduction to Einstein's General Relativity*, Cambridge; United Kingdom: Cambridge University Press, 2021.
- Lamers, Henny, and Levesque, Emily, *Understanding Stellar Evolution*, Bristol; United Kingdom: IOP Publishing, 2017.
- Lauer, Tod R., et al., 'New Horizons Observations of the Cosmic Optical Background', *The Astrophysical Journal*, Vol. 906, (January 2021), pp. 77.
- Liddle, Andrew R., and Lyth, David H., *Cosmological Inflation and Large-Scale Structure*, Cambridge; United Kingdom: Cambridge University Press, 2000.
- Kervella, Pierre; Arenou, Frédéric; Mignard, François; Thévenin, Frédéric, 'Stellar and substellar companions of nearby stars from Gaia DR2. Binarity from proper motion anomaly', *Astronomy and Astrophysics*, Vol. 623, (March 2019), pp. A72.
- Pathria, R.K., and Beale, Paul D, *Statistical Mechanics*, Oxford; United Kingdom: Elsevier, 2011.
- Roser, Max, 'The future is vast— what does this mean for our own life?', ourworldindata.org, (March 2022)