

REMEMBER, REMEMBER:
A HERO'S JOURNEY THROUGH THE
DECOMPOSING FIELDS OF HUMAN ECOLOGY

by

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ABSTRACT

Remember, Remember: A Hero's Journey Through the Decomposing Fields of Human Ecology.

Jesse Paul Dotson.

This is a story about a millennial student of sustainability struggling to find meaningful sense of identity after coming of age in the shadow of the Anthropocene. The protagonist –Hero– is confronted with an overwhelming sensation that the environmental movement is operating in a state of high-functional denial, insisting we can win a war that we may well have already lost. In a moment of desperate alienation, Hero asks a higher power ‘for help?’ What follows is an epic journey in search of ‘the circles of life’ in which Hero traverses the human ecology of everyday life. The search becomes less about new solutions, or even correct actions, and more about discovering the power of interpretation to shape our relationships to the world around us. The decomposers become a main theme, as Hero is advised that ‘applying compost is feeding the earth,’ and comes to understand that in a trophic sense, ‘feeding the decomposers’ is an ecosystem service that we (consumers) have provided for a very very long time. What’s more, our bodily wastes feed the decomposer too, and discussion of the microbiome leads to the realization that with every bite ‘we are feeding us, and the decomposers in our gut.’ Nutrient cycling and human composting bring up questions of ‘life after death.’ Hero begins to see that the biological decomposers offer a profound model element in any system that has both production and consumption and wonders about a variety of systems that might benefit from including the decomposers— from economics, to the arts, to social media and more.

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REMEMBER REMEMBER

A HERO'S JOURNEY THROUGH THE DECOMPOSING FIELDS OF HUMAN ECOLOGY



BY JESSE PAUL DOTSON

A Fall to Action

Day 1

We've got five Years, stuck on my eyes.
Five Years, what a Surprise.
We've got five years; my brain hurts a lot.
Five years; that's all we got.

-David Bowie¹

We are naming this Uncertainty
as the pivotal psychological reality
of our time.

-Macy & Johnstone²

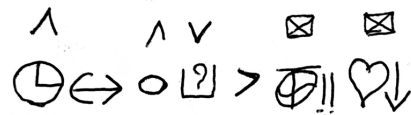
I know. But I do not approve,
And I am not resigned.

-Edna St Vincent Millay³

1 David Bowie (1972) "Five Years" *The Rise and Fall of Ziggy Stardust and the Spiders from Mars*. Song.

2 Macy and Johnstone (2012) *Active Hope: How to Survive the Mess We're in Without Going Crazy*. Book. p.1-2

3 Edna St. Vincent Millay (1955) "Dirge Without Music" *Collected Poems*. Poem.



He stood there; fourth in line. Waiting. He was going to ask the same question he'd been asking every speaker on climate change over the last few years. It always came out a little different, but the point was the same. Only once before had he received a satisfying answer... About a year ago the head of climate change research at a major university answered his question in a very honest way: "You know, as a scientist I was trained to distance my emotional reactions from my work. I always try to stay objective, and I don't want to scare people... That's why I skipped over this slide earlier." Flipping back through power point slides she arrived at the one she had skipped. It showed the curve of increasing CO₂ concentrations in the atmosphere, a Keeling curve⁴, complete with projections into the future. Unlike the one she had spent some time explaining that projected 100 years, the graph on this slide projected 500 years into the future. This one was really scary. It showed a runaway greenhouse effect for four out of five of the predictive models. "It's really hard to look at it objectively" she'd said, "and yea, I try to keep emotions out of my presentations, but I have been at a conference where a room full of scientists just burst into tears at the end of the presentation... it was quite the experience."

Another person down; he was third in line.

It was that image of a bunch of climate scientists just sobbing in some nondescript conference room somewhere in the world. It didn't really matter where they were. Some Hilton, maybe a Marriott, or even a big convention center. Those conference rooms all felt the same.

⁴ A keeling curve is a graph showing the accumulation of CO₂ in the atmosphere over time. It has been named after Charles David Keeling the scientist who first began regularly measuring CO₂ PPM at Mauna Loa Observatory in 1958.

Some patterned carpet that masked stains, a bunch of uniform chairs, crappy fluorescent lighting, free coffee in the corner if they were lucky. The thought of everyone just crying about climate change—that was powerful. For all the years he had been following climate change, that was something he'd never seen. He'd listened to so many speeches, attended so many events, but had never seen everyone cry. For years now he hadn't quite been able to understand this. These events, and the conversations surrounding them were always filled with so many passionate emotions—fear, anger, blame, hope, and inspiration... They reminded him of the image in that one song about the end of the world,

News guy wept and told us,
earth was really dying.
he cried so much his face was wet.
I knew he was not lying.⁵

Bowie wasn't a prophet, but damn those lines felt prophetic. The whole song really. But especially *that* image. Grief, sadness, and despair are transparent emotions. Contagious. Like laughter or yawning, they spread through bodies without asking permission. Mirror neurons make it very hard to watch real grief and feel nothing (unless you're a sociopath). He'd often wondered what would have happened if Al Gore had just burst into tears and cried unconsolably while testifying to Congress. Or how the 350.org climate marches would have been received if the millions of people marching wept openly for what had already been lost after we crossed the movement's namesake of 350 part per million CO₂ in the atmosphere...

His mind wandered 'How do you know when you've lost a war?'

⁵ David Bowie (1972). "Five Years" *The Rise and Fall of Ziggy Stardust*. Song.

That's a wicked question he thought... We don't talk about stopping climate change *that* was possible thirty years ago. Today we are at 414 ppm⁶ CO₂ and our language has shifted to building resilience, mitigating effects, and preparing our children for a different world. We have already lost what we originally set out to defend. There is no earthly territory untouched by the effects of climate change. Now we talk about climate change as if it's an occupying force that will be here for the foreseeable future. Again, mild applause momentarily drowned out his thoughts, another question down; he was second in line now.

It always seemed like grief was the elephant in the room at events like this. Or maybe the collective 'shadow' in the Jungian sense. There's almost a palpable stoicism in discussions like this—'crying is weakness'—and right now we need to be strong to defeat climate change. Stoic. If we don't control our emotions, we lose. But, at what point have we already lost?

He was up next; he should probably stop daydreaming. Focus yourself. You're about to be the center of attention in front of a few hundred people. You're about to ask Naomi Klein a question. Someone's going to hand you a microphone. His knees felt weak and his palms were sweaty, but on the surface, he probably looked calm and ready... he kept on forgetting⁷...

'Here we go' he thought as the microphone came to him.

As the woman handed over the microphone, she held onto it for an extra second as it passed between their hands and whispered, "Remember to introduce yourself."

⁶ The first draft of this sentence was written in January of 2018, with a global average of 410ppm Atmospheric CO₂, and the final draft was written in December of 2020, with a global average of 414 ppm Atmospheric CO₂. Sourced from: www.co2.earth

⁷ Eminem (2002) "Lose Yourself" 8 Mile: Music from and Inspired by the Motion Picture. Song

He looked up, and their eyes met, and he gave the slightest of nods acknowledging that he would oblige. As he raised the mic up to his mouth it shook a little as he started to speak:⁸

“Hello, my name is Hero, so I guess I read *This Changes Everything*⁹, as a student, a couple years ago, and honestly it felt to me like the appropriate emotional response was to cry, it felt really heavy. You sort of made a joke when you first came up, that you could give the whole diagnosis of the problem and then we could all go get real drunk later, and I’ve definitely done that, but I’m also really curious about the role of sadness and crying... and... moving forward. Specifically, in asking you, if that’s something that happens in private conversations that you have... I feel like there’s a really big shyness to do that in any sort of public way... but... I don’t know.”

She coughed for a second, and took a moment to get a lozenge before answering looking like the question had taken her back a bit,

“That’s a great question...um... That’s a really great question... We’ve been talking about this with our LEAP group about whether we should be building ‘Primal Scream’ sections into our gatherings. Because like I do... I don’t think you can build a healthy movement on repression... you know, um, and this is,, this is... There’s nothing scarier than talking about that core loss of safety of our collective home, right? Just kind of powering through that and not acknowledging the grief is a really big problem... Because that’s actually how most people respond to it... And there’s this weird kind of activist idea, “we’re gonna scare people like hell and that’s gonna turn them into activists” and in fact, most people just want to curl up into a ball after you scare the hell out of them right?

There’s a network... Some of you probably know about the Transition Town network¹⁰, and they have a stream within their tool kit, called Inner Transition, which is exactly what you’re talking about, where people have the space to grieve, and to deal with loss... Because the losses are happening and I think any healthy movement dealing with life and death issues, will create

⁸ This is almost direct transcription of the back and forth between Naomi Klein and I that took place at the Evergreen state college in 2017. I cleaned it up a little for readability and changed “Jesse” to “Hero” I have a lot of respect for Klein, and I think it is important to note that while she gave a 600+ word answer—which in hindsight I think is pretty good—I walked away only having heard a few of those words, and well, obsessing over them, to the exclusion of all the others. I think this is a good example of the complicated nature of human communication; the inability to listen when triggered and the fallibility on one’s memory.

⁹ Naomi Klein (2014) *This Changes Everything: Capitalism vs The Climate*. Book.

¹⁰ *The Transition Town Network* is something like a decentralized global network of community level think tanks and case studies that embody a whole range of sustainable living. If you’re not already familiar with them, the movement is well worth exploration, and much can be found at: transitionnetwork.org/

space for people in that movement to express their grief, or it will come out in all kinds of other ways right?

So yea, I think it's something we have to get a lot better at. You know, it's funny you say that about *This Changes Everything*, because, in fact, there are about two pages of scary climate science in *This Changes Everything*, and I toyed with having none because I don't want to have that impact, and I ended up going with what was the absolute bare minimum of 'these are the stakes if we don't get off this road'... it's just a little part of the book and then I move on.... and I've been trying to figure out how to do it in my work, in my writing... I don't really like getting up in front of rooms full of people and crying, it's not who I am but, you know I did make a little documentary film about taking my five year old son to go see the great barrier reef in the midst of a mass bleaching¹¹, and umm, the reason I made that decision was because I felt like, you know, just the incredible injustice that kids today are growing up in this era of mass extinction, not only are we creating this very unsafe future for them, but we're depriving them of the some of the great wonders of the world. I'm looking for ways to talk about it, and address it that gets at that grief, and the more personal side of it, because I think that if we don't find ways to talk about this in a way that (sic) reflects the grief, then we're sending a mixed signal, like, 'It's the end of the world... but I feel fine' and that doesn't make sense....so we have to somehow get our message in line with the emotions it evokes."

She didn't understand why people thought *This Changes Everything* was so sad... What?

That's crazy! He thought, as he returned to his seat. He remembered all those years ago when *An Inconvenient Truth*¹² ended and he sat in the dark theater thinking "This is my calling. This is the war I will enlist to fight in. This is the struggle that will bring meaning to my life..." But all these years later, after the tours of activist duty, he sat in a folding chair in a half-full gymnasium reflecting on this interaction with one of the preeminent climate change journalists in the world, who seemed to not understand why her work inspired such sadness.

¹¹ Michon and Lindsey. (2018) "Unprecedented 3 Years of Global Coral Bleaching, 2014–2017." *NOAA*. Article.

¹² Davis Guggenheim (2007) *An Inconvenient Truth* (staring Al Gore). Documentary Film.

The real ‘inconvenient truth’ was the five stages of grief¹³ manifesting within the populations who understood global environmental problems. “Scientists are talking about an intense mix of emotions right now.”¹⁴ We’re all asking, ‘Why am I doing this?’¹⁵ just as the physical processes of climate change are complex and multifaceted, so too, are the emotional effects. Professionals in the related fields are becoming intimately aware of the costly ramifications of both...”

Hero didn’t really know what it meant to reach *acceptance* of climate change and thus, couldn’t blame anyone for being stuck in denial, anger, bargaining, or depression...that last stage was scary.

Of course, *denial* was easier. We see this in *Them* all the time. ‘The climate denier’ is a well-established character, and an all-too-common caricature. The strain of overt denial seems less like a psychological coping mechanism, and more like a rhetorical tactic, used to win the ‘Us versus Them’ cultural battle.... But there was an insidious form of denial found among his own people, a high-functioning denial that positioned itself in counter distinction to the overt climate change denier. The climate change believer is thus by definition imagined not to be in denial. To Hero it always seemed affluence was a much stronger predictor of your ecological footprint than whether you believed climate change was a serious problem. If you learn that the glaciers are disappearing because of climate change, and your response is to go see them before they disappear completely, you’re sort of missing the connection between your own behavior and the reason the glaciers are melting in the first place.

¹³ Elisabeth Kübler-Ross (1969) *On Death and Dying*. Book.

¹⁴ David Corn (2019) “It’s the End of the World as They Know It: The Distinct Burden of Being a Climate Scientist.” *Mother Jones*. Article.

¹⁵ Madeleine Thomas (2014) “Climate Depression Is for Real. Just Ask a Scientist.” *Grist*. Article.

Anger feels good he thought. Hero had been angry, so angry... but it didn't seem to lead anywhere helpful. He used to think that anger was the goal, if you got angry enough, and got everyone else angry enough, got a million people in the streets who were all angry, it would undoubtedly lead to change... but it inevitably seemed misdirected. Us vs. Them. Hero remembered the absurdity of the animal rights activists protesting the Makah whale hunt.¹⁶ In retrospect, it seemed almost satirical. The Makah people had probably been hunting whales during the roman empire, and although thousands of acres on the Olympic Peninsula were ceded in an 1855 treaty, the tribe had retained their rights to fishing and whaling. After observing significant population decline, the Makah stopped hunting gray whales in the 1920s—decades before others did. They became active in conservation efforts protecting the gray whale. Some seventy years later, in the late 1990's the gray whale population had recovered, and tribal members decided to do a whale hunt. Soon Neah Bay was flooded with activists who seemed so flooded by anger that they were unable to see anything beyond 'They're going to kill a whale' which was unfortunate and ultimately made the activists look like assholes.

Maybe anger was counter-effective too. If we wanted CEOs to take our concerns seriously, maybe we shouldn't have branded them as sociopathic self-interested capitalists. With anger came a relentless misdirection, a reliable absence of self-reflection, and a rather polarizing self-fulfilling prophecy. Starting a conversation with some version of 'You're evil' rarely leads to a productive conversation.

¹⁶ I went back and forth about whether or not to include this story because I don't speak for Makah, and am hesitant to write about them... but I'm including this, because it's a story about my people — I am a proponent of animal rights and an activist— acting in ways that are perhaps well intentioned but ultimately ignorant, arrogant, and self-defeating. The risk of becoming blinded by anger, and lashing out at the wrong people, is likely to actually alienate people from your cause... sometimes the people best positioned to help. Read about the Makah in their own words here: www.Makah.com

Bargaining was how all the literature kept extending the date for decisive action against climate change. First it was 2000, then 2010, 2020, and now the latest IPCC¹⁷ report says we have until 2030 to cut our emission by 40% if we want to limit global warming to 1.5°C.¹⁸ Although this is the current stated goal of the Paris Climate Accord and 1.5° degrees of warming doesn't sound like much, the effects of 1.5° warming are going to be devastating. It only looks like a worthy goal because a 2° rise starts to look considerably worse. We keep making deals with ourselves, failing to make good on our promises, and making new deals. It keeps getting worse every year, and yet every year we make more and more deals with ourselves... ten more years, ten more years.

The whole eco-product response to environmental problems also really plays on bargaining as a psychological coping mechanism—selling us ‘personal choices’ as a way of saving the world. If I buy *this*, then *that* problem will disappear— that’s bargaining Capitalism style.

Depression Hero knows well. He gets stuck in this stage. Depression has come and gone in waves for many years. After that first bargain, ‘I’m going to enlist!’— Hero bounced around between anger, bargaining, high-functioning denial, but almost always ended up back at depression. He’s analytical, systematic and critical, and every time he sees some hope, he looks closer, and ends up in depression. Just numb. Sometimes going through the motions. Sometimes in bed for days. That feeling was coming on... He started to wonder if this is the beginning of another cycle. Shit. No!

How could Naomi Klein not understand why *This Changes Everything* was so sad?

¹⁷ The Intergovernmental Panel on Climate Change (IPCC) was formed in 1988 through the United Nations, and still today is one of the foremost institutional authorities on climate change.

¹⁸ IPCC (2019) SPECIAL REPORT: GLOBAL WARMING OF 1.5 °C. Report.

What would *acceptance* even...

Applause filled the air and moments later people stood to leave. The Q & A was over. Hero missed the last few questions, busy caught up in his own head. He wondered if everyone did that, or it was just him... A room full of people with eyes open, but minds racing off somewhere else completely.

“Lost” he thought as he walked out of the auditorium...Walking to the parking lot he felt himself spiraling down again thinking about *This Changes Everything* and Klein’s comment about putting only two pages of scary climate science in the book... It wasn’t the climate science that was so sad. He’d been a student of sustainability for years; he felt pretty desensitized to the scientific reality of climate change. No, it was something else about the book that was so sad. It was, well, the loss of his childhood innocence, the way her story lined up so perfectly with his own life. He was born the year *Time Magazine* named ‘The Endangered Earth’ as their person of the year¹⁹. He’d read the whole article; it articulated the clear and present danger posed by the myriad of ecological crises facing modern civilization. The line “This year, the Earth spoke; like God, warning Noah of the deluge” always stuck in his mind.

The nerve of his parents to bring a child into the world that year and name him ‘Hero’ as if he was actually going to be able to do something. They always told him that it was going to be up to his generation to save the Earth. They admitted to screwing it up but acted as if the fix was something for the next generation. Klein had talked about her son, how he both motivated and devastated her... Hero had imagined this too, thinking of his children, the ones he desperately wanted, but was altogether too responsible to have. Too aware of the impact a human life made

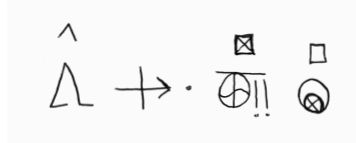
¹⁹ Thomas Sancton (1989) “Planet of The Year: What on EARTH Are We Doing?” *Time Magazine*. Article.

on the environment, and the fragility of his own economic situation... He had often thought about that next generation, his nieces and nephews, born into a culture that was simultaneously victim and perpetrator of ecological crisis. Self-aware but unable to collectively change direction, like the addict who is both the cause and consequence of his own addiction... He always thought about that next generation, but *This Changes Everything*, like no other text, put into context the reality that Hero was *that* generation. He was the one in preschool during the era when climate change could have been avoided. He was the one watching Captain Planet²⁰ snuggled on the couch while government subsidized industrial globalization and propagandized environmental stewardship.

Hero hadn't quite understood why his mother cried so much when the Supreme Court stopped the recounts, and the Texas oil man was elected instead of the Tennessee environmentalist... It was while reading Klein's work he learned that Gore initiated the first congressional hearings on climate change in 1976, as a freshman senator. It was these stories, and the realization that Hero should have been sobbing too, but that at 11, he really didn't understand how that day would shape his future. If the Supreme Court hadn't stopped the recount, we might have spent trillions fighting a war against climate change instead of fighting the war on terror (for oil?)— as if climate change wasn't terrifying enough to justify a warlike effort. It seemed to Hero like a warlike effort was exactly what we needed. The precedent for change was there, three days after Pearl Harbor the auto-industry's manufacturing lines were

²⁰ “*Captain Planet and the Planeteers*” is an animated children’s series based on the premise of environmentalist superhero’s saving the world from toxic pollution.

being retooled to produce weapons... If Climate change wasn't a big enough threat to invoke the Defense Production Act again, it was hard to imagine what would be.



Hero had taken his keys out of his pocket but walked right past his car. A strange impulse. He couldn't sit in a metal box right now; the thought of turning the key and firing up the engine made him feel sick to his stomach... He headed for the tree line at the end of the parking lot, thinking about Richard White describing Bill McKibben as "a man who lives far more deeply in his own head than in the natural world he writes about."²¹ Maybe that was Hero's problem too. He spent too much time in his own head... but where else? Was there a better way to examine a problem? It did seem like the more time he spent trying to understand the problems, building complex and dynamic models in his head, the more wicked they became, and more hopeless and depressed he felt. Everywhere he looked all he could see was the impact. Upstream and downstream. Those were real places, and he couldn't help but project them in the present tense. It was just bad.

The 'Declared Fuel Reserves' too, he thought as the forest approached, that's why we haven't moved on climate change... It'll crash the global economy the moment we decide that we can't burn any more fossil fuels. It's really a simple problem. A wicked coupling of the global economy and fossil fuel industry: 'Four trillion dollars' he thought, that's an absurd amount of money. Something like the GDP of Canada and Brazil combined would just disappear, Poof! Gone from the global financial markets. The 2008 financial crisis showed how

²¹ Richard White (1995) "Are you an Environmentalist, or do you Work for a Living?" Book Section.

money disappearing from one part of the world can have drastic effects somewhere else. People stopped paying their mortgages in Florida and Arizona, and Iceland's economy crashed. What a twisted system. Four trillion dollars' worth of fossil fuels still below ground, but already valued above ground. That's why we can't act... But at the same time *not* acting is a commitment to a suicide attempt. We're going to overdose on fossil fuels far before we run out of our supply...

People fear 'peak oil', but that's sort of an economic and technological problem, not an ecological one. We might be halfway through our stash of fossil fuels today, but new equipment and sensors might find more. It's already a bit unclear whether or not our burning of those fossil fuels has already set-in motion positive feedback loops that could create a runaway greenhouse effect. There's methane trapped in the arctic ice sheets. The oceans currently act as a giant carbon sink, absorbing a lot of CO₂, but there's a tipping point where the balancing reaction starts moving the other way. Ocean acidification could lead to massive die off of oysters, shrimp, and corals, and huge releases of GHG back into the atmosphere... Every wildfire releases a whole bunch of CO₂ into the atmosphere. So many ecological disasters just lurking in the shadows.

Just like an addict, we face the decision between short-term and long-term effects. Taking the easy road—getting high again—will undoubtedly lead to a worse outcome in the long-term, but it means we don't have to deal with a painful withdrawal now. It takes courage to admit you have a problem, and to face withdrawal head-on. Unfortunately, we seem susceptible to get stuck in this pattern. This was what *This Changes Everything* documented so well. How over and over again short-term economic stability came up against long-term ecological catastrophe... and over and over again the leaders of the free world choose to take just one more

hit of capital, while they ‘set the intention’ to one day choose environmental stability... just... maybe tomorrow, or next year.



There was a sensation as he crossed the threshold between parking lot and forest. It was like a switch flipping. In the parking lot his body was subdued and passive while his mind raced, but now all of a sudden, his body was racing, and his mind was calm. He started running once he hit the tree line. Moving fast. He didn't have a reason. Just an overwhelming urge. He felt like Crash Bandicoot or Indiana Jones: as if there was a giant boulder chasing him. Of course, there was no boulder, just the crushing weight of his situation. The fear of repeating the past. The fear of returning. The fear of another cycle on the hamster wheel on industrial civilization.

He came to a stop. Panting and hunched over, out of breath momentarily, he let out a yell. A scream. Something. It was loud. It scared him at first, a sound he didn't really know could come out of his body. Maybe, this was the 'Primal Scream.'

He didn't know what to make of it in his head, what logic or function it had, but it felt good in his body. He kept going. The screams turned to sobs, and he fell to the ground. It felt like that temper tantrum a young child would have. That inconsolable fit of emotion every child felt expressed... and every parent countered with force, or neglect. In Hero's culture, this was the most embarrassing thing a five-year-old could do to their parents. He remembered his father's anger at his tearful refusal to sit for a picture with the giant Easter Bunny at the mall all those years ago. But there was no one trying to stop him here. And, perhaps for the first time in his adult life, Hero was not trying to stop himself from crying.

He let it all out. Sobbing uncontrollably, he slumped against a tree and slid to the ground. He wept for a long time without being really clear exactly why. It was an overwhelming sense of loss, but for what exactly? Hero wasn't sure, he just knew he'd lost something he couldn't get back. A loss of hope? Of faith? Of safety? Or meaning? Purpose? Direction? ... those all felt somewhat true, but what the hell did that mean moving forward? He just didn't know what to do next... and that really seemed the crux of it.

That squirrel knew what to do.

As Hero had been sitting there slumped against the tree trunk, he'd noticed a steady trickle of little bits of something falling down to the ground a short distance away. As he followed the stream upward his eye rested on a squirrel voraciously eating a pinecone. He watched as the squirrel finished, tossed the center of the cone to the forest floor, darted up the tree, and returned moments later with another pinecone. Over and over again that squirrel finished a pinecone, darted up the tree, and returned moments later with another.

If I only could make a deal with God, and get them to swap our places, I'd be running up that tree...²²

He caught himself thinking of that narrative trope—making a deal with God. What did it feel like to have that faith? That ability to ask for and receive guidance. Hero needed that now... Sometimes he thought life would be so much easier if he was a believer. He was always a bit envious of people who had such a clear vision of their place in the world. It seemed healthier. He'd been trying to find his place in the world, but it felt so self-defeating. The closer he looked at his relationship with the natural world, the more he felt like the villain of the story.

²² Placebo (2003) "Running Up That Hill" *Covers*. Song.

The more he examined the history of his people, the more trapped he felt in this dysfunctional relationship. It started with the agricultural revolution, got on steroids with the industrial revolution, and today, he was living through the digital revolution.

Hero knew more about the natural world than he had ever before, and yet, he felt ever more isolated— and convinced that every place where he was tangibly connected to the environment, his presence was damaging... but now here he was sitting with his back against a tree wishing for the life of a squirrel. He thought of a distant childhood memory, lying on his back and watching the squirrels run through the trees at his grandmother's house; he'd wanted to be a squirrel that day too. So much simpler he thought.

What did he have faith in...?

This question muddled around in his thoughts for hours as the sun faded into darkness, and was replaced by the bright white light of a nearly full moon... Finally, he realized he had faith in Earth. He believed without a shadow of a doubt that Earth was a network of complex nested systems far beyond his comprehension. Hero had faith in Life on Earth.

Suddenly he thought, the only thing stopping me from making a deal with God was my own shadow. He thought for a minute, and then quietly said aloud,

"I don't know if I believe in God per se, but I do believe in, well, You, Life on Earth and I need your help. I feel alone. I know we have been intimately connected for billions of years, and yet, I feel lost. I need more than a less harmful relationship with you. I need a healthy one. But I have faith that you are here...here, there and everywhere and I am here, and I will be waiting..."

Crossing Thresholds

Day 2

I fear that mass production has come to stay,
both in commerce and education.

A.S. Neil²³

The symbols of mythology are not manufactured,
they cannot be ordered, invented, or permanently suppressed.
They are spontaneous productions of the psych.

Joseph Campbell²⁴

Everything you see here exists in a delicate balance.
As king, you need to understand that balance,
and respect all the creatures,
from the crawling ant to the leaping antelope.

Mufasa²⁵

²³ A.S. Neil (1966) *Freedom—Not License!* Book. p.47

²⁴ Joseph Campbell (1949) *The Hero with a Thousand Faces*. Book.p.2

²⁵ Allers and Minkoff (1994) *The Lion King*. Animated Film.



Hero's eyes opened with a start 'I was in the forest' — that much was clear, but the rest was rather hazy. It felt like the end, or the beginning. Thinking backwards, she smiled. "Yes" she thought, I was having the most intense dream... one of those dreams that ends with you finding yourself exactly where you are when you wake up. A moment of synchronicity between the dream world, and, well, *here*. I had been walking through the woods and "I ran across a monster who was sleeping by a tree, I looked and frowned, and the monster was me" floated through her mind.²⁶

It wasn't a scary dream, or really even a happy dream. Strange. Like one of those natural history specials on PBS.²⁷ Some computer animated rendering of the dinosaurs... Sitting there listening to the birds sing she tried to make sense of the images that came flooding back. It had felt like a dream of evolution set to some great rhythm that was now echoing in the distance.

She'd been standing on molten rock, watching fireballs and lightening bolting from the sky. From below, oceans appeared, first blue, then purple, and finally green. The rocky ground softened as giant mushrooms came and went, and the lush green of plants spread over the landscape. There was a dinosaur, eating a tree. A large dragonfly the size of an eagle. A giant sloth the size of an elephant. It all happened in a blurry rush of movement that only became clear when Hero focused and something like a photograph would appear momentarily. A forest

²⁶ David Bowie (1970) "The Width of a Circle" *The Man Who Sold The World*. Song.

²⁷ *Eons* is a series of videos produced by the public broadcasting system (PBS) that explores the deep history of planet Earth. It is well worth watching and can be found at: pbs.org/shows/eons

arose around her, as if she'd taken a seat and just watched the seasons change. She could have been staring for a thousand years... Looking around at the forest, a message came through loud and clear— You wouldn't believe what I've been through.

This triggered a moment of self-reflection, and Hero stopped breathing for second as she remembered past the dream, past the forest itself. That auditorium, Hero's question, the existential crisis, that squirrel, and the teary deal with God, the bargaining for a new creation narrative... Just something other than *being* the species destroying the planet.

That was all she wanted. A way to make sense of her identity without being the villain in the story. She didn't particularly want to be the Hero anymore either. She really just wanted a sense of place and purpose. She'd tried taking on the weight of saving the world, but it had crushed her. She had ended up in pieces on the floor. It was the picking up and reassembling of those pieces that felt important now. It seemed a paradoxical reaction, but by focusing so much on trying to fix the world, it appeared that Hero had actually broken something within her. Now she was trying to save herself.

In hindsight, it all seemed melodramatic, hitting rock bottom, asking for help, hoping she could be on the receiving end of some divine bit of wisdom. It all seemed childish now. Nonsensical. And yet, the thought struck her: I had desperately asked *Earth* for help, and then, had this lucid natural history dream.

Looking around it was the strangest thing; the plants seemed slow, or, somehow impermanent. It was as if she could see the forest growing. Ghost-like images of the dream superimposed themselves over the forest. As if her mind's eye filled in the past and the future simultaneously. With unfocused eyes, she saw a time lapse, like those videos of plants growing from seed. Sort of like seeing time projected onto the whole forest. In the blink of an eye, Hero

could see the colors changing from the lush greens of today into the golden yellow and brown of the winter, the flashes of overwhelming white, and the soft greens that emerge as the spring returns.

It reminded her of that scene in *The Matrix* where Neo gets plugged into the computer and learns Ju Jitsu—all of it—in a matter of minutes. She certainly hadn't woken up knowing how to fight, but there was something new, something that felt like it wasn't there before. 'As if I had terabytes of vision downloaded into my consciousness,' she thought, 'Neo got the data from the rebellion's computer network, but I'm not hooked up to any networks... where did all *this* vision come from?'

That existential doomsday clock moved a little further into the periphery as her vision filled with these GIF's of life. There was something very calming about this new set of visions. A nice respite from the doomsday clocks that had been haunting Hero.

She thought about Captain Hook and the alligator who swallowed the clock... oh how that alligator had plagued Hook.²⁸ Laughing a bit as she saw the parallel, it was funny somehow—picturing that haunting voice of climate change as an alligator who swallowed a clock. Hook was triggered by the sound of a clock, reminded of the looming threat of the alligator who had already bitten off his forearm and was determined to eat the rest of him... This was what *It* felt like, in some sense, she had been traumatized by an awareness of the socio-planetary crisis. A flood of images, narratives and understandings about the direct consequences of her life for the rest of the natural world's population were never far from mind. Like the association for Hook

²⁸ J. M. Barrie (1911) *Peter and Wendy: The Story of Peter Pan*. Book.

between the clock and the alligator, she had learned to become triggered by everyday objects. Almost all of them.

In fact, she'd learned so many bad associations that there was never a time she could look around the room and not find dozens of 'clocks' hauntingly ticking back at her. There were so damn many of them that navigating through the world became the task of trying to follow the path of least clocks... Which, sort of by definition means focusing your attention on the clocks— even if only as a means of attempting to avoid them.

There was just something funny about this thinking back... that she—or anyone else— could have expected anything other than her own trajectory; feeling alone and crippled under the emotional weight of knowing her presence on this planet was akin to that of a cancer. There was some solace in knowing that she— and many of her people— were at the very least, self-aware of the situation. Cancers ultimately commit suicide by growing to the point that they destroy the environment they live in. We seem to be on this path self-destruction, while often simultaneously possessing an earnest desire to save the world.

There's some serious cognitive dissonance here, she thought, I wonder if we'll ever figure out h...

“Interesting, very interesting.”

“Huh?”

She looked around, not able to place the voice but again noticed something falling out of the tree. She looked up, tracing the path of falling debris, and found yet again the squirrel sitting on a tree branch staring at her while decimating another pinecone. She made eye contact and asked,

"What are you looking at?"

“You.” said a voice in her head, “Isn't that obvious?”

Feeling a little stupid she smiled, “I guess it is.”

“You humans can be so ignorant, eye contact is a universal language, it means— I’m looking at you.”

It was strange. The squirrel wasn’t exactly talking. It was mercilessly devouring a pinecone. Staring all the while. And yet, somehow, she could hear its voice, or thoughts, or something. It was probably a hallucination. She’d fallen in the rabbit hole, and some deep part of her psyche was manifesting this Cheshire Cat like dynamic with a squirrel.²⁹ Maybe she was actually going crazy. That was definitely possible. She had spent enough time in the big city to know that people were perfectly capable of having breaks with reality and suddenly occupying entirely different worlds. She’d watched entire conversations happen between a person and what appeared to her as empty air or an inanimate object. She remembered, *The Man Who Mistook His Wife for a Hat* and grew slightly concerned³⁰ Was this what was happening, was she going crazy.

“Am I losing my mind?”

“Maybe you have found it.”

‘Oh god.’ she thought. It *was* happening to her!

“Oh, you can stop me if you really want to... Most of the animals I know gave up even trying to communicate with your kind generations ago. It’s mostly pointless. We listen sometimes, but even that can be painful. You just seemed a little different. I was

²⁹ Lewis Carroll (1865) *Alice’s Adventures in Wonderland*. Book.

³⁰ Oliver Sacks (1985) *The Man Who Mistook His Wife for a Hat and Other Clinical Tales*. Book.

listening yesterday, and you—unlike any other human I’ve ever met—seemed to understand that you were already lost. Most of your species has such a strong superiority complex that you would never ask for directions because that would mean admitting that you’re lost. From our perspective the vast majority of you have been lost for nearly as long as we can remember. There are those of your kind who still speak with us regularly, but they are becoming increasingly rare and from what they say increasingly powerless within your world. I’m pointing out that being able to hear me, might suggest that you have found a part of your mind, perhaps it is a part of you that was lost generations ago.”

It was an interesting thought. She certainly did feel lost. It felt very uncomfortable to allow herself to have a conversation with a squirrel. At the same time, there was something oddly comforting about it.

“So, you are saying that all humans used to be able to speak with animals?”

“Yes. There was a time when we all communicated.”

“We used to speak the same language?”

“Not exactly, it’s more like before there was what you call ‘language’—we all just understood each other. The body makes sense out of the many signs and signals in the world... Like right now, I’m communicating in my language, and you, are understanding me in your own. I have always considered this

ability a gift from our common ancestor and millions of years of co-evolution.”

Ohh, like the universal language translators in Star Trek she thought.

“What happened?”

“We started living in different stories.”

“What do you mean?”

“Your people started telling a story that placed them in the center of the world. Many of us protested this, pointing out the arrogance and absurdity of such a claim, but their communications fell on increasingly numb minds, which continued building a new world right on top of ours... The story I have heard is that at first, they would ignore us consciously, but as time passed, generations grew up in the shadow of their parent’s ignorance. Those children, and their children’s children, made the major perceptual step from ignoring us, to not actually understanding that we are here to ignore in the first place.”

“What’s your story?”

“That’s simple. We live in the circle of life.”

“Will you tell me that story?”

“The story of the circle of life means something a bit different for every-body. It’s what connects us, but we still have our own little

niches. The circle of life is less a story that you tell, and more the
kind of story that you embody.”

“Then how do I embody the circle of life?”

“You just have to find the circle of life and embed yourself within
it.”

As she entertained this vision, thinking about what it meant to find the circle of life, the squirrel scurried up the tree and out of sight. Hero thought, ‘Find the circle of life and embody it’ as she waited for the squirrel to return— but it did not. After a while, she got up and left her spot under the tree and started meandering her way out of the forest.

While walking Hero pondered if talking to a squirrel was all that different than having a conversation with any number of other cultural objects or institutions.

She thought about shopping; she might spend 20 minutes talking to herself about whether or not to buy a particular pair of shoes. And in some sense this conversation was all happening *inside* her, but this was dialog was also very much occurring between Hero and the shoes. The process of narrowing down to a particular pair of shoes meant saying ‘no’ in some form of another to all the other shoes in the store. In some sense, a key to grocery shopping was an internal dialog that allowed you to walk those isles saying ‘no’ to some forty thousand of the items and ‘yes’ to maybe twenty-five or thirty. She wasn’t sure if she’d ever bought something without a little story floating through her head— narrating in the present tense— justifying her decisions.

Social constructions speak to us through inanimate objects all the time, so is it all that crazy to have other living things speak to us...If she can have an internal dialog with a pair of shoes, why not a squirrel?

She tried to imagine what it might be like if everything she had committed to memory—the various street layouts, the movie plots, the brand identities, the rules of grammar, the names of celebrities— if *all of it* were replaced by knowledge of the seasons and creatures of this world.”³¹ Unfortunately she realized it was probably true that she could identify more corporate brand logos than common local plants and animals. Looking around she noticed that she had just a fraction of the language to describe this environment compared to what she could say as she imagined walking through a grocery store.

This was one of the pernicious side effects of consumer culture; we have redirected much of our interpretative power away from nature and toward fostering specific interpretations of particular products and brand identities. A sort of environmental synesthesia— a crossing of our interpretive wiring that somehow redirected our ever-present capacity for communion with the world away from active interpretation of natural features and toward passive reaction to human constructions.

As she kept walking and focused her attention on the plants, and birds and bugs— she felt better. While she was not able to name all of the different species that she saw, if she tried, it was actually pretty easy to distinguish them. She realized that when the living thing is happening in front of you, you don't really need to have a name to appreciate it. There was

³¹Chellis Glendinning (1994) *My Name Is Chellis & I'm in Recovery from Western Civilization*. Book. p.19

something in being surrounded with all this life that—when Hero allowed it— triggered in her a “sense of wonder so indestructible” that it had somehow survived in her all these years.³²

After finding a particularly cool looking mushroom and taking a photo of it, she decided to make it a game and spent the rest of the walk looking for them. She found seven different mushrooms before she reached the edge of the forest.



Hero emerged from the forest and looked around trying to orient herself— soon realizing trail she’d started following had brought her our right behind the college’s organic farm. She walked around the perimeter fence, snacking the on the raspberries growing through it. Hero loved raspberries—they were usually so expensive, and she could not help but feel like she’d won the lottery, *all you could eat organic raspberries!* And Ron Finley’s voice floated through her head, “Growing your own food is like printing your own Money”³³

After eating her fill, she kept walking around the farm, heading back to the main trail towards campus—but she’s stopped in her tracks as she turned the corner and walked past a big carved wooden sign on a tree. It read: “The Circle of Life a Community Garden”.

³² Carson and Kelsh (1998) *The Sense of Wonder*. Book.

³³ Ron Finley — I first heard him say this in his Ted Talk, but It’s one of his sayings, he says it a lot, it’s even on merch you can purchase on his Website: <http://ronfinley.com/>

Hero was staring at the sign, rather dumfounded, when she heard someone walking up behind her, “Hello,” the woman said, “It’s a nice sign.”

And after a smile,

“Is there anything in particular I can help you with?”

“Oh no, you just caught me in a serendipitous moment—I was just walking through the forest thinking about what it would mean to find the circle of life, and then low and behold,”

said Hero, gesturing to the sign mounted on the tree.

“Well,” the gardener replied, “this place has a habit of drawing people in... It’s powerful.”

“Caught my attention” said Hero.

Opening the gate, the gardener said,

“You’re welcome to wonder around. I’m here today for a couple hours to spread out some compost... and you’re more than welcome to join me with that too,” adding “I’m Rachel—by the way.”

“I’d be happy to help...and my name is Hero.”

“Nice to meet you Hero,” said Rachel.

“We should go get a couple of rakes, and we might as well grab the other wheelbarrow and get some more compost too. We’ve got a lot of trees to feed.”



A few minutes later Hero was walking behind Rachel as she pushed the wheelbarrow down the path in between the beds to little orchard at the back. Hero counted 16 trees and a number of vines crawling along the back wall. The gardener stopped a couple feet from the trunk of one and tipped over her wheelbarrow and instructed Hero to go to the next tree and do the same. Once Hero understood the flow of the task at hand, they worked for a while exchanging small talk now and then, each of them with a wheelbarrow and rake, making trips back-and-forth to the large compost pile.

The gardener had explained that the goal was to get somewhere around an inch of compost evenly spread across the ground under the trees. It felt good for Hero to use her muscles. To have such a clear physical goal, move this stuff from that big pile over there— then spread it out over here. A different kind of work.

After a while Hero got up the nerve to ask:

“Suppose you were trying to find the circle of life, you know, not this community garden, but like the big idea... like if you were trying to be part of the circle of life, what would you do?”

“Oh, I think you're part of the circles of life whether you're aware of them or not. That's inescapable. I do lots of things that help ground me in the cycles, but spreading compost is definitely one of them.”

“How so?”

“The nutrient cycle is one of the big complex natural systems that I think of when I look for the circles of life...The decomposers are the means by which last year's death becomes building materials for this year's life. You see, applying compost

doesn't just increase soil fertility—it is a crucial part of the process that gave us fertile soil in the first place. We are feeding the Earth.”

“I like that.” said Hero, thinking to herself that it couldn't be that easy. Was applying compost really a way to act out a circle of life? The critic in her tried to counter this framing, it seemed too simple. Too focused. Composting might be good, but she wasn't going to settle for a simple answer in her quest for the circle of life. Eventually asking aloud,

“Where else do you find the circle of life?”

“Where don't you?” Replied Rachel without really giving Hero a chance to answer before she continued,

“It's everywhere... So, it's less about where you look and more about which lenses you look through, and where you choose to focus.”

“Ok, but what lens? and where do *you* focus.”

“I think trophic dynamics is a good lens... and lately I've been focusing on the decomposers.”

“Trophic dynamics?”

“Yea, that's a more technical term, basically it describes the sum of all food chains in a particular ecosystem, which when you actually look at them appear much more like food web than food chain. If you squint your eyes just right, the populations of an ecosystem can be divided into three categories: producers, consumers, and decomposers. Although the species will vary widely, you will find these three categories in nearly every ecosystem... and yet, if you look

around at our culture, we have gotten really good at production, and consumption, but we remain ignorant of decomposition. In a sense, we have been at war with the decomposers for generations. I have often thought one of the best things we can do to rediscover our relationship with the natural world, and its circles of life, is to make peace with the decomposers.”

“Hum... what do you mean by war with the decomposers?” questioned Hero.

“Think about it, the decomposers are still one of our primary competitors for food, shelter, and our own deep history. How many loaves of bread or fresh tomatoes have you lost to them? What percentage of your food has undergone pasteurization? Or has been frozen? Or dehydrated, or has some form of preservatives added? These are all, in a sense, effectively weapons we have developed in our war against the decomposers... How many houses are lost each year by molds, fungi, or termites?

Part of wood becoming lumber involves a process of infusing it with any number of chemicals chosen specifically for their toxicity.³⁴ That’s why you should never burn treated lumber.³⁵ How many creosote-soaked pilings have polluted the very waters we swim in?³⁶ How much industrial pollution has occurred because there was no plan or sense of responsibility for the decomposition of their chemical byproducts? Chlorine bleach, for example, reacts to form dioxin, a known human hormone disrupter— but its widely used in textile manufacturing, cotton

³⁴ Schultz, Nicholas, and Preston, (2007), “A Brief Review of the Past, Present and Future of Wood Preservation” *Pest Management Science*. Journal Article.

³⁵ Tame, Dlugogorski, and Kennedy (2007) “Formation of Dioxins and Furans During Combustion of Treated Wood.” *Progress in Energy and Combustion Science*. Journal Article.

³⁶ *Skagit County Marine Resources Committee* (2009) “Skagit County Creosote Inventory and Removal Project: Phase III” Report.

processing, and paper making. I could go on and on, but the point is we've screwed ourselves time and time again because we only account for production and consumption, and then externalize decomposition— as if that is somebody else's problem..."

Rachel paused for a second looking off into the distance, eventually continuing,

"You know, in some ways it's a problem of imagination, or vision—when we think about the world, we fail to grasp on a conceptual level that decomposition is an integral part of how our world works. It is not so much that we fail to understand decomposition when we look directly at it, but more like, when we look at anything else, we fail to ask ourselves how decomposition applies?"

"Do you have an example of 'anything else'?"

"Take the pyramids for example, they are unquestionably an outstanding example of ancient human engineering, are they not?"

"Yea, they are, and other stone structures around the world too," Hero said, seeing flashes of Tikal, Mesa Verde, Ayutthaya and any number of others in her mind's eye.

"Precisely. There are ancient structures made of stone found all over the world... How do those that relate to the decomposers?"

Hero thought about the question for a second before answering,

"I guess because stone doesn't really decompose."

"Exactly. Stone doesn't decompose at nearly the same rate and is much harder to build with than any other number of other organic materials— wood being the

most obvious. If we see examples of structures made of stone all over the world, and account for the decomposers, one can only imagine all the human-made structures of the past created from wood, grasses, bamboo, and reeds that have been consumed by the decomposers. We will never know exactly what they built, but it also seems foolish, not to at least try.”

Hero found herself thinking back to the Ewok Treehouse villages in that galaxy far-far away³⁷... She had experienced a brief obsession with ancient structures a few years back, and for all the hours of YouTube documentaries she had watched, she couldn't remember anyone ever making this point, but now it seemed so obvious,

“I see what you mean, an artifact is an artifact because it escaped total decomposition... because the vast majority of organic material does decompose, what remains of our ancestors, is by definition, what didn't decompose.”

“Yes! exactly” Said Rachel. “We only know of the dinosaurs because some of their bones didn't fully decompose for 65 million years!” Adding, “or at least they decomposed in such a way as to preserve their structure. If I remember correctly, a fossil is sort of like a bone that has turned to stone.”

And struck with another thought Hero added, “And the way that we know the dinosaurs are 65 million years old, is through measuring another kind of decomposition. On a molecular level, some decomposition reliably occurs at a very steady rate. We say the dinosaurs are 65 million years old because we can measure the rate of atomic decomposition in those fossils.”

37 Richard Marquand (1983) *Star Wars: Return of the Jedi*. Film.

“Yes. Or, in the sediment surrounding them. Radiometric dating has been crucial in establishing the timeline of natural history... I had never really thought about atomic decay in that way—as another form of decomposition. Stratigraphy is important for dating fossils too!”

“What’s that?”

“Stratigraphy is the branch of geology that relates the layering of sediment over time.” Switching subjects Rachels added,

“I’m getting thirsty—going to go get some water— you?”

“Sounds good,” Hero replied— still lost in thought...

On the walk back over to the shed, hero realized that it had been like sixteen hours since drinking any water and was thus very thankful when the gardener pulled down a mason jar, filled it from the tap, and handed it Hero.

After a large gulp Hero said, “Thank you I lost my reusable water bottle yesterday.” Having realized on the walk over that she’d left it sitting on the floor next to her seat in the auditorium the night before, after asking *that* wicked question and getting lost in her head.

Pulling a lid out from a drawer and handing it over, Rachel said, “You can keep this one,” adding jokingly, “Just keep track of it, after all, the vessel that contains water might just be the most use-full invention of our species. It’s certainly more valuable than the wheel and the microchip.”

Hero laughed, realizing that what Rachel said was probably true, “I’ll take better care of this one.”

There was something about Rachel that intrigued Hero. She kept saying things that Hero basically already knew, but she seemed to have a way of rearranging them into a pattern that Hero had never noticed before, but then once she saw that pattern, Hero couldn't help but feel that she wouldn't be able to unsee it.

Hero knew from personal experience that bugs, bacteria and fungi regularly stole food from the intimacy of her own kitchen, and of course it made sense that we have been competing for food with bugs and bacteria and fungi for really long time. She had just never really put it all together as front line in a war between trophic levels.

Thinking about *Ishmael*³⁸ she asked, "Have you read Daniel Quinn?"

"Oh yes, my favorite is *After Dachau*³⁹, but yea, I think I've read everything he's ever written. Why do you ask?"

"I was just thinking about it, and I was wondering if this war with the decomposers maybe one of the qualities that distinguish the Takers and the Leavers?"

Smiling Rachel replied, "You know I've never thought about that, but I think you're probably right. The Leavers take only what they need and leave the rest behind as food for everything else. While the Takers take all of the food for themselves and do their best to guard it from everything else."

"I like that, I always felt like the Takers metaphor was so clear, but the Leavers was much harder to visualize... But I see it now, everything that the Leavers

³⁸ Daniel Quinn (1992). *Ishmael: An Adventure of the Mind and Spirit*. Book.

³⁹ Daniel Quinn (2001) *After Dachau*. Book.

leave becomes food for something else, which becomes food for something else, and so on and so on.”

“Yeah, you could read that story through the lens of soil ecology. It's not just that the takers took all the food and locked it up away from other people, they were also taking the food away from the decomposers. Of course, overtime this leads to decreases in soil fertility, which leads directly to the need for the takers to continuously expand their territory. I'm happy you thought of that.”

“Me too.” Said Hero.

“Shall we get back to work?” asked Rachel.

Hero agreed, and on the walk back the gardener went on, “I might use that vocabulary to help encourage people to compost at home, of course it would only work for people who've read *Ishmael*, but then again, everyone should ... I really like the idea that composting, however small, is a means by which you could become a 'Leaver in your own home.' I'm always looking for ways to talk about composting in ways that I feel do it justice.”

“Do it justice?”

“Yea, a lot of people have negative associations with composting, and we need to navigate through that. Composting is, in effect, feeding the soil that feeds us. You asked about the circles of life earlier, and I think there is no lesson in life that we need to learn more desperately than awareness that we are intimately connected to the cycles of life, and that we have the agency to take that knowledge and re-understand ourselves.”

“You really like compost, don’t you?” Hero responded jokingly.

“I do.” Rachel smiled, “I think composting is a way to witness something magical about how the world works... Follow me I want to show you something.”

Walking, the gardener went on, “For the last eight years I have insisted on planting these demonstration plots, where I plant the same things into side-by-side plots, one amended with significant amounts of compost, and one given only water. You can see some difference now, but by the end of the season it is rather staggering.”

When they arrived at the plots Hero saw that the gardener was right, she could see the difference. One of the plots look considerably lusher and more alive than the other. The plants were significantly bigger, greener, fuller looking... and Rachel went on,

“The lesson is that if you feed your food scraps to the decomposers, they in turn feed the plants, who eventually feed us. This can be witnessed here on an experiential level. I dare say, the person who has not seen their watermelon rind transformed into a lush tomato is missing a key understanding about our world. It has become fashionable to say things like ‘the world is all connected’ or ‘we are all one’ but our familiarity with these catchphrases obscures the life-changing implications that emerge if we take them seriously.⁴⁰ It’s very challenging to take a story seriously if you cannot find it tangibly in our own personal life. By story, I don’t mean a work of fiction, but rather the way that we make sense of events and process experiences as they unfold around us.⁴¹ We all know the story about

⁴⁰ Joanna Macy (2007) *World as Self, World as Lover; Courage for Global Justice and Ecological Renewal*. Book, p.30

⁴¹ Macy and Johnstone (2011) *Active Hope: How to Face the Mess We’re in Without Going Crazy*. Book, p.14

gravity, but we also all have a sensory experience of gravity. When there's integrity between story and sensory experience—well— we can do what would have previously been assumed to be impossible. We can do magic. We can fly.”

Hero wondered what it would mean to take ‘the world is all connected’ as seriously as we take the proposition ‘I can separate this part of the world from that part’... In some sense, it seemed the difference between natural and human constructed laws. You can break our laws; you can't really break natural laws.

Rachel kept going, “Most of us know a story about nutrient cycling, but unfortunately, relatively few of us has had the sensory experience of the nutrient cycle. This is a problem because the nutrient cycle is as intimately intertwined with our lives as gravity. For better or worse, the fact is, our actions have a much bigger influence on nutrient cycling than they do on gravity. That's why I'm so into composting, it offers a window through which we can glimpse something crucial about the way the world works...”

Hero chided back, “You ignore gravity at your own peril.”

“Yes! But this is important, once you understand gravity, you can play with it. Once you understand the nutrient cycle, you can play with it. We cannot build satellites or bridges without understanding gravity. We cannot hope to either understand or to manage the carbon in the atmosphere unless we understand and manage the trees and the soil too.”⁴²

⁴² Freeman Dyson (1992) *From Eros To Gaia*. Book. p.172

“You know, I see what you're saying. Although, I must confess I'm one of those people you suggest is missing that crucial experience. I have never watched my watermelon rind transform into a tomato. You're making me wish I could have a compost bin, but I live in an apartment.”

“You know, you could have a worm-bin.” Apparently reading Hero’s face, she added, “I have one inside.”

“Really, doesn’t it smell bad? And don’t the worms escape?”

“Nope, not as long as it’s maintained properly; the right bedding materials, moisture, aeration and food supply are all it takes. Oh, and of course, the worms, and the bin as well. You can buy the bins, but they’re also pretty easy to make. There are lots of videos about DIY worm bins on YouTube out of buckets—and you can almost always get free 5-gallon buckets from the recycling bin outside the cafeteria. If you would like, I could give you some worms before you go.”

“I’d like that” said Hero, “I’ll give worm-bin composting a try.” After pausing for another moment of reflection, she went on to say, “This all feels very serendipitous.”

“How so?” asked Rachel

“Yesterday I felt so hopeless and overwhelmed. Our future felt so uncertain. You know, like we can no longer take it for granted that our civilization will survive,

or even that our planet will remain hospitable to complex forms of life.⁴³ I was really feeling *that* yesterday.”

“You were really feeling it?” Rachel echoed in a softer voice.

“Yea” Hero agreed, “like I was a cancer upon this planet. We just have so many problems. I’ve spent the last many years looking at those problems, and the pattern I see over and over again is humans —and by extension human systems—growing indefinitely. If a cell in your body grows indefinitely, we call it cancer—and yet, we humans celebrate our own continuous growth as the greatest success story ever.”

Remembering where she’d started, and not wanting to get lost again in the negatives, Hero pivoted and went on,

“Then this morning walking through the woods I was thinking about finding ‘the circle of life’ you know, as a juxtaposition to the story of indefinite growth—and suddenly I walked out of the forest here, met you, and now you’re offering me the opportunity to compost and grow soil in my apartment. I can feed some of my food waste to worms, and in turn, feed their waste to my house plants. You just told me how important you think composting is, and frankly that is a much more tangible connection than I had expected to find.” Adding hastily, “Although I’m not really sure what I did expect.”

⁴³ Macy and Johnstone (2011) *Active Hope: How to Face the Mess We’re in Without Going Crazy*. Book. p.1-2

“I’m so sorry. I fear *that* fear is my generation’s fault. We made a big mistake when it came to educating your generation about environmental problems.⁴⁴ We started with the catastrophes—teaching children about climate change and melting ice sheets and the disappearing rainforest first, because we thought it was most important. And well, how do I say this...the mistake we made was not understanding the psychology of primary associations. You should have learned about composting through sensory experience years before we introduced climate change. We effectively taught millions of children to characterize their relationship with nature using themes of doom and gloom. We took the world's biggest problems and brought them to elementary, middle and high schools all over the world and effectively said ‘You are responsible for this!’ We screwed up because we failed to understand that for many children—and frankly adults too—this was actually the first time they really thought about their relationship to the natural world. Which means their introduction to the fields of human ecology was through learning about its very worst and most abusive relationships.

But, yea, the circles of life...please know those bad relationships are just a small part of a much bigger story. We should be helping our children understand that it is our relationships with the natural world that give us life. We got it exactly backwards. It’s like introducing sexuality by discussing examples of sexual violence—before they even reached puberty. We wanted to inspire you, but too often we just traumatized you.”

⁴⁴ David Sobel (1996) *Beyond Ecophobia: Reclaiming the Heart in Nature Education*. Book.

Rachel looked solemn, and took a deep breath before continuing, “I think that we had been traumatized by the situation ourselves and we felt powerless to do anything about it, so we repeated one of the most dysfunctional, yet persistent patterns of intergenerational human behavior: We repeated *the trauma cycle*.

That is to say, we found a population with even less agency than ourselves and reenacted the traumatic experiences from the power position. Sometimes I fear that those of you who took us seriously might have gotten the worst of it. At my age I have come to understand that one of the worst things you can do to someone is to tell them the story of the world in which they are the villain. I was a part of that, and I am sorry. There is something particularly dangerous about being so convinced about the righteousness of your intention that you’re blinded to the unintended consequences of your actions. But that’s a lesson you might have to learn from personal experience.”

Hero was a little taken aback, “I don’t think I have ever heard anyone say anything like that before...Thank you, I suppose.”

Thinking back on her experience and trying to integrate the gardener’s words she felt some resistance, perhaps due to a couple of teachers who she both loved and had successfully scared the shit out of her about the environment.

“Yeah, well, it’s hard to admit you’re wrong.” Rachel went on, “although, personally I find it harder to keep telling myself ‘*I’m Right*’ once I’ve seen the unintended consequences of my actions up close. But... environmental education has grown and developed a lot since then, and I think the importance of introducing the natural world through sensory experiences and intimate examples

of connection are finally breaking through. This foundation of appreciation for complex interconnectivity of life on Earth is a necessary foundation for being able to really deal with these global environmental problems. You should've experienced composting long before you were expected to take on the weight of climate change." She looked Hero directly in the eyes, and continued, "Your response-ability is to do the best you can do, with exactly what you have, in the location you are in. I mean it. Anyone who tells you otherwise is likely projecting their own sense of insecurity.

The uncertainty of climate change and its impacts a psychological reality of our time— there is plenty of insecurity in the air. We all feel it, whether we're conscious of it or not. By honoring your pain for the world, by really feeling it, and not running, or hiding, or suppressing that sense of insecurity, our pain can become one of our most intimate connections⁴⁵ But that sense of insecurity must be faced head on, otherwise we'll just keep projecting our shadow's agency onto others." Finishing in a much less serious tone, "It's like an endless game of hot potato...But you want to catch that potato, cook it, and eat it!"

Laughing a little, Hero added, "When pigs eat wolves⁴⁶ — that last metaphor reminded me of the book I read a couple years ago, a retelling of the three little pigs fairy tale from a Jungian psychoanalytic perspective. The wolf embodies the pig's shadow; each pig the attempts to build a shelter from the Wolf. The first

⁴⁵ Macy and Johnstone (2011) *Active Hope: How to Face the Mess We're in Without Going Crazy*. Book. p.57-81

⁴⁶ Charles Bates (1991) *Pigs Eats Wolves: Going Into Partnership With Your Dark Side*. Book.

two are destroyed, but the third pig who, learning from the failures of the first two, is successful in blocking the wolf out. In the final scene, the third pig invites the wolf in, confronts it, and eats wolf stew for dinner! It's a good book your hot potato metaphor reminded me of it.”

“Sounds like a good book, I’ll look for a copy of that later,” Rachel said as she pulled out her phone—presumably making note of the title.

“I definitely recommend it,” said Hero.

Then after reflecting for a moment, she went on,

“You know, yesterday might have been the first time ever really let go and actually felt all of this pain and anguish and despair, grief for the world that had been building up inside of me for who knows how many years. I’ve been through bouts of depression, when my body felt numb and lethargic for weeks or even months on end. This felt different. Yesterday my body felt alive; distraught and completely hopeless, but alive. In all honesty, for the first time in my life I asked for help from a higher power. Like I needed to have faith in something and my faith in humanity is running out.”

“That resonates, I have had some intense low points. At this moment in history, we are called upon to admit that we are without hope. Like the alcoholic, we have hit ‘rock bottom.’ We are powerless before the civilization we inhabit, and we are powerless over the destiny of our lives within this civilization. This statement

does not mean that you and I are powerless as individuals.⁴⁷ Rock bottom is a powerful place. It is the place where nearly all recovery stories begin.”

After pausing for a second she added, “And it seems to me like you are on the path towards recovery. After all, the first three steps of a 12-step program are: 1. We admit we were powerless over alcohol or any of our addictions—that our lives had become unmanageable; 2. We come to believe that a power greater than ourselves can restore us to sanity; and 3. We make a decision to turn our will and our lives over to the care of God as we understood him.⁴⁸ You might have crossed a threshold...”

Hero was a little taken aback by the synchronicity with which her experience over the last 24 hours and the first three steps of a 12-step program aligned. Of course, for her it wasn't drugs or alcohol that she felt powerless over, but more like industrial civilization, and her position within it.

“What's the fourth step?” she asked.

“Make a searching and fearless moral inventory of ourselves.”

Hero thought about this for a second before saying, “I like the idea of a searching and fearless ecological inventory.”

“That sounds like a worthy reframe” said Rachel, quickly adding, “Although, that's also a very big task, we are so damn interconnected that trying to inventory all of your earthly relationships is a serious endeavor. Don't expect to have a

⁴⁷ Chellis Glendinning (1994) *My Name is Chellis & I'm in Recovery from Western Civilization*. Book. p.128

⁴⁸ Bill W. (1976) *Alcoholics Anonymous; The Big Book 3rd edition*. Book. p.59-60

whole inventory anytime soon. Just find a thread and follow it. If you are searching and fearless, you will find yourself crossing the threshold into new territory.”

Hero let the gardener’s words swim around in her body for a bit, before saying,

“Well, if you’re willing to give me worms, I have found my first thread. I really liked what you were saying about the decomposers; I had never thought about us as at ‘war with the decomposers’, but I think you are right, there is something incredibly interesting there.”

“Wonderful. I'm glad the decomposers grabbed your attention. I’d love to hear what you discover. Would you want to come back next week? Same time? You know we could get you set up with a garden plot too if you're interested?”

“I would really like that,” said Hero.

“Okay. It's a plan: 9 o'clock next Sunday. I'm excited. I want to talk about something else too, an invitation of sorts.”

This last bit peaked Hero’s attention, but before she could even ask about the invitation Rachel was pulling out her phone again and saying,

“Oh look at the time, it's almost 11:30, and I'm supposed to be downtown at the food bank at noon! I'll leave a note in the shed so someone else can finish

applying the compost this week, or we'll do it next Sunday. Let's get you those worms!"



Ten minutes later Hero walked along the trail back through the woods holding an old yogurt container filled with worms. The gardener had punched little holes in the top with a safety pin. “So the worms can breathe,” she had explained.

What a day she thought—and it was only noon. Words and phrases kept swimming in and out of focus in her mind. Rock bottom—searching and fearless—war and peace with the decomposers—feeding the Earth. This last thought jolted Hero into an awareness that she was really hungry.

She usually didn't eat much on campus; a large multinational corporation had an exclusive contract to serve the food, and consequently, most of it was pretty bad. The campus bulletin boards were often littered with flyers describing some atrocity committed by the company serving that food. But Hero was starving, so she decided to get some nachos from the cafeteria. On the walk over she decided that after she ate, she would go drop the worms off in her car, grab her notebook, and then to the library to do some research on the decomposers. She knew a bit, but it had been years since that environmental studies class, and while she thought the gardener's comments were correct, she wanted to explore some more academic sources on the decomposers.

As she sat eating, she wondered what a searching and fearless inventory of her plate of nachos would look like? She imagined a map tracing each of the ingredients in her nachos to

their source. The sour cream and cheese probably came from industrial dairy farms. The avocados might be putting money into the pockets of the drug cartels.⁴⁹ Monocropping, herbicides, oil-derived pesticides, nitrogen runoff, soil erosion, deforestation, exploitive labor practices, displaced people, fragmented habitat—the list could on and on and on—*Fresh fruit, Broken Bodies*⁵⁰ echoed in her memory.

A fearless and searching socio-ecological inventory of this plate of nachos?

To do it properly, she thought, would be something like a master's thesis. I could spend years just trying to fully inventory the ecological impacts of this plate of nachos! And even then, there would be aspects missing. Perhaps this was what the gardener meant about a lifelong task. A searching and fearless inventory of human-ecological relationships was something whole disciplines have been trying to achieve for decades.

She always tried to read the labels and make ethical decisions about the food she ate, but far too often those decisions were constrained by Hero's account balance. At the best of times, she could afford about 75% of her grocery shopping theoretically aligning with her values of ecological stewardship and ethical labor practices, but at the worst of times almost all consideration for the integrity of her meals flew out the door—replaced by the simple need to maximize the ratio of calories ingested per dollar spent. Cheap food—she always imagined—had the worst ecological footprint.

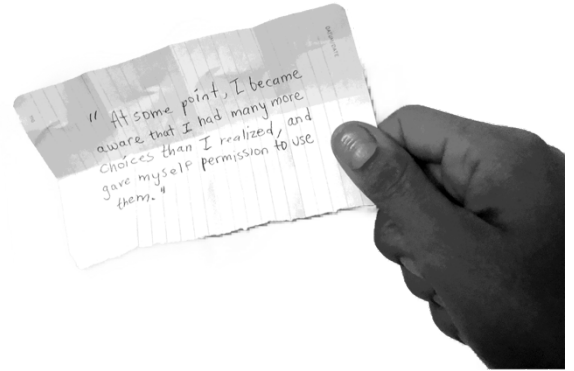
Hero tried to imagine finding something positive here, in this plate of nachos, but it seemed unlikely...

⁴⁹ Ruth G. Ornelas (2018) "Organized Crime in Michoacán: Rent-Seeking Activities in the Avocado Export Market." *Politics and Policy*. Journal Article.

⁵⁰ Seth M. Holms (2013) *Fresh Fruit, Broken Bodies: Migrant Farmworkers in the United States*. Book.

She went to the bathroom after she finished, and while washing her hands she noticed a folded piece of paper with its corner tucked into the mirror. She could see there something written on it. There was ink bleeding though the back of lined paper. Pulling it out she read,

“At some point, I became aware that I had many more choices than I realized, and gave myself permission to use them.⁵¹”



Smiling to herself, imagining the person who wrote it, she pocketed the little piece of paper and left the bathroom.



At the library, Hero walked up to the research desk and asked the librarian, “for help finding the decomposers.”

The librarian was looked thoughtful for a moment, and then smiled,

“So, you’re looking for your destiny?”

Hero must've looked puzzled because the librarian quickly followed up with,

“Oh, it’s just an old joke... Let’s see—ecology.”

After some typing and a glance at her computer screen, she said,

⁵¹Charles Bates (1991) *Pigs Eats Wolves: Going Into Partnership With Your Dark Side*. Book. p.51

“I’d go poke around QH.541.”

“Thank you,” said Hero. “I’ll go have a look.”

The librarian sent her off with a gracious,

“Feel free to come back if you have any more questions.”

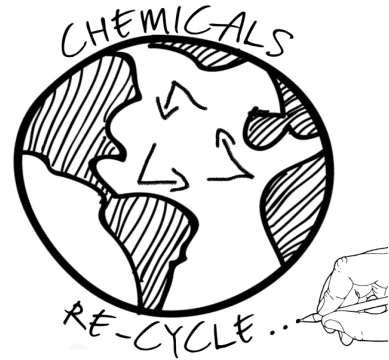
In the appropriate section, Hero scanned the shelves, impulsively pulling out books, flipping through them and checking the index for ‘decomposition’ or ‘decomposers’. Soon she had a small stack of books on the floor that felt a bit overly ambitious. As she carried her books over to her favorite spot on the second floor of the library —underneath the large stained-glass window— she was reminded a child’s overflowing plate at a breakfast buffet. Hero was good at taking only what food she could eat, but when it came to all-you-can-read words, she usually ended up with more words than her brain could possibly process. Some of her earliest memories were checking out stacks of books from the library. She had spent a lot of time there growing up, but as a college student it often felt like library was a giant haystack hiding Hero’s needle. It felt nice to get back a little of that feeling of awe and wonder the library offered as her as a child. Being a college library, this one was larger and more dynamic than most— something like a Las Vegas Sunday brunch buffet!

After getting settled, she began flipping through the books. Hero read that all ecosystems,

Require an input of energy, but they also need chemical inputs of water, carbon, and nutrients...A critical difference exists between the imputes of energy and that of chemicals. Energy is a one-way process. As energy is used or stored in changes state and degrades in quality (the second law of thermodynamics). Unlike energy, nutrients, carbon and water can be used, recycled, and reused time and again. These chemicals can be stored, transformed into different chemical configurations, and then returned to their initial state. [this] recycling process [is] known as a nutrient cycle.⁵²

⁵² Mark B Bush (2003). Ecology of a changing planet 3rd edition. Book. p.67

While reflecting on how energy and chemicals differ on a systemic level in way that they move through ecosystems, Hero realized that so many of our civilizational level systems were modeled after the flow of energy. They were unidirectional, linear, and assumed a constant input and output, a supply chain that started with resources, transformed them into products, and created waste. This is *The Story of Stuff*⁵³ she thought. The difference between cradle to cradle and cradle to grave⁵⁴. Might this tension between linear and cyclical systems not just be of our own creation, but also be found in the relationship between systems of energy and material? Do we not occupy this dymaxion place between energy and matter?



She jotted down a couple of diagrams, thinking also about how Spaceship Earth was



fueled by solar energy, but pretty much everything else was made of chemicals. She wondered if the story of people could be understood as those who began to identify themselves as the embodiment of energy— as opposed to the material of this Earth. Of course,

she thought, we are both.

But, Hero wondered, what it would look like if we modeled our economy off the flow of nutrients through an ecosystem? Could it be that our propensity toward linear systems is a consequence of our understanding the flow of energy before we understood the flows of

⁵³ Leonard and Fox (2007) *The Story of Stuff*. Animated Film.

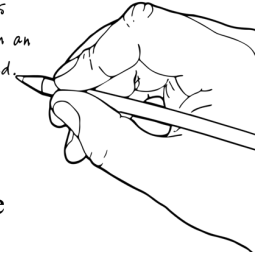
⁵⁴ Braungart and McDonough (2002) *Cradle to Cradle: Remaking the Way We Make Things*. Book.

materials? She didn't know this history all that well, but it was an interesting thought. Like learning about climate change before understanding the decomposers. Perhaps economy is a branch of ecology—and not the other way around. Maybe there was something in the evolutionary dynamics, like energy was a limiting resource for early human populations, the populations that adapted to capture and control energy could outcompete everything else, and so of course those who came to dominate associated that success with energy and began to reimagine themselves as energy.

Hero also read about both abiotic and biotic forms of decomposition. Abiotic decomposition occurs without life--exposure to air, water, light or heat can slowly weather materials through chemical interactions. This sort of non-biological interaction frees up nutrients and minerals in the first place; however, once free, these materials are taken up by primary producers and sometimes eaten by consumers, but almost always end up as food for the decomposers. She wrote down her own definitions for these two categories of decomposition.

Abiotic Decomposition:
Occurs via chemical interaction between object and environment, without an active biological process.

Biotic Decomposition;
Occurs via chemical interactions between object and organism wherein an active biological process is involved.



She followed an index entry for the 'decomposers' and kept reading. She discovered essentially the same things the gardener had said, but there was something about reading it in a textbook that was particularly powerful.

Without the decomposers life as we know it wouldn't be possible — all the dead plants and animals would just pile up on top of each other and these “accumulations of dead organic matter would sequester the nutrients required to support plant growth.”⁵⁵

As the pieces get smaller and smaller the surface area available for the other decomposers is maximized. She read that, "Fungi and bacteria are the main initial decomposers of terrestrial dead plant material, accounting for about 95% of the total decomposer biomass and respiration."⁵⁶

*The Decomposers;
Fungi, Bacteria, Archea, & Detrivores.
The orginisms that sustain themselves through
consuming organic wastes and in doing so breaking
that material down into smaller and smaller
components that are eventually reconsumed by plants.
Thus compleating a cycle in the circle of life.*

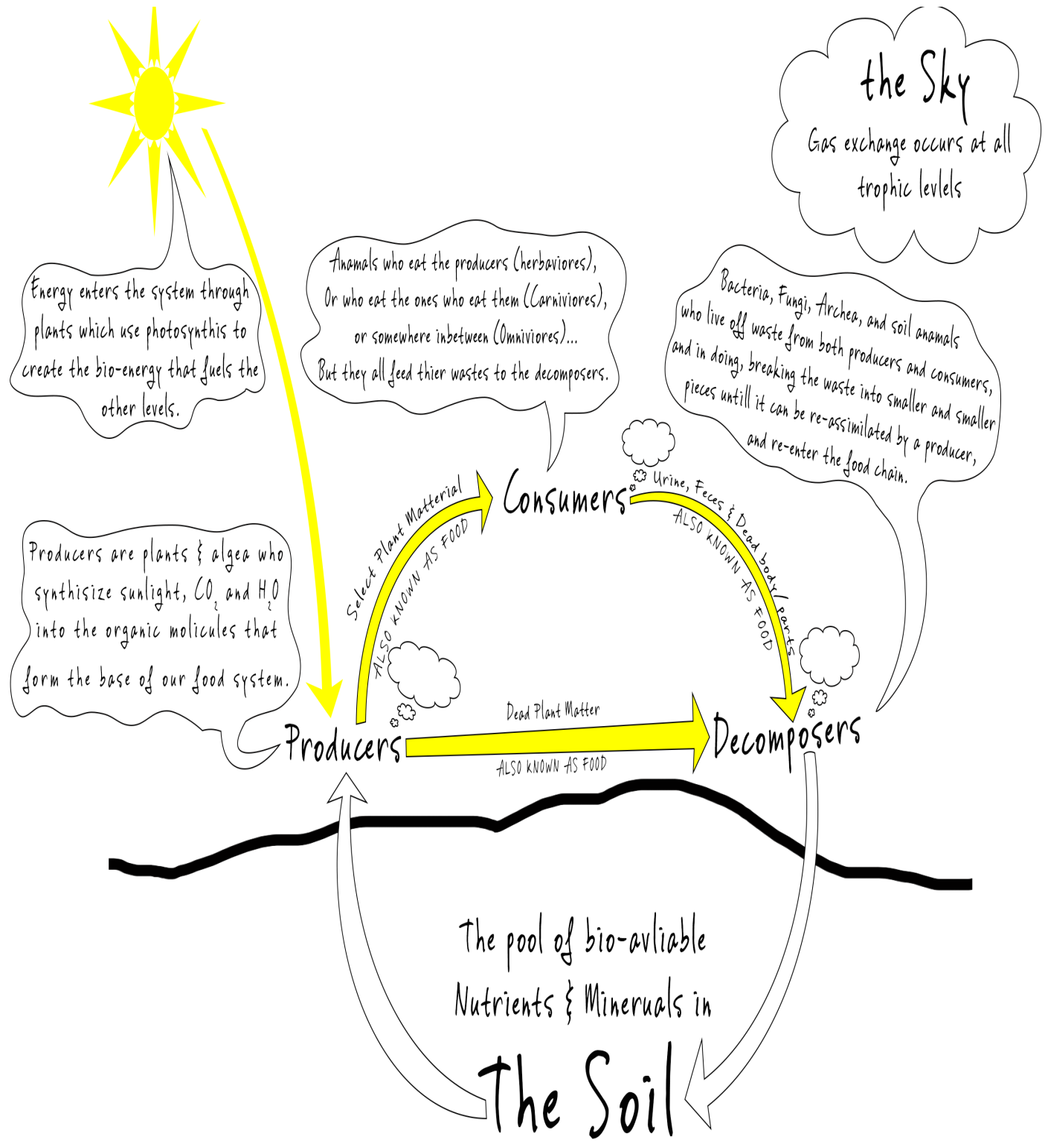


Hero learned that fungi and bacteria are such great decomposers, not just because of what they eat, but because of *how* they eat it. They eat by secreting enzymes that trigger chemical interactions in the material immediately around their body, making nutrients and minerals bioavailable for absorption. Essentially, bacteria and fungi digest their food outside of their bodies. As it turns out, digesting outside one's body provides an important ecosystem service by breaking organic materials back down into bioavailable forms, not only for fellow decomposers, but also for any primary producers whose roots are within reach.

Hero moved on to a section about trophic dynamics where a big diagram jumped off the page at her... and so after reading the section and spending a bit of time with the diagram, she redrew the graphic— adding her own thoughts and using a highlighter to mark the flow of energy in bright yellow. Just as in the textbook, the diagram took up almost an entire page.

⁵⁵ Chapin, Matson and Vitousek. (2011) *Principals of Terrestrial Ecology 2nd edition*. Book. p. 11

⁵⁶ Chapin, Matson and Vitousek. (2011) *Principals of Terrestrial Ecology 2nd edition*. Book. p.186



Energy enters the system through plants which use photosynthesis to create the bio-energy that fuels the other levels.

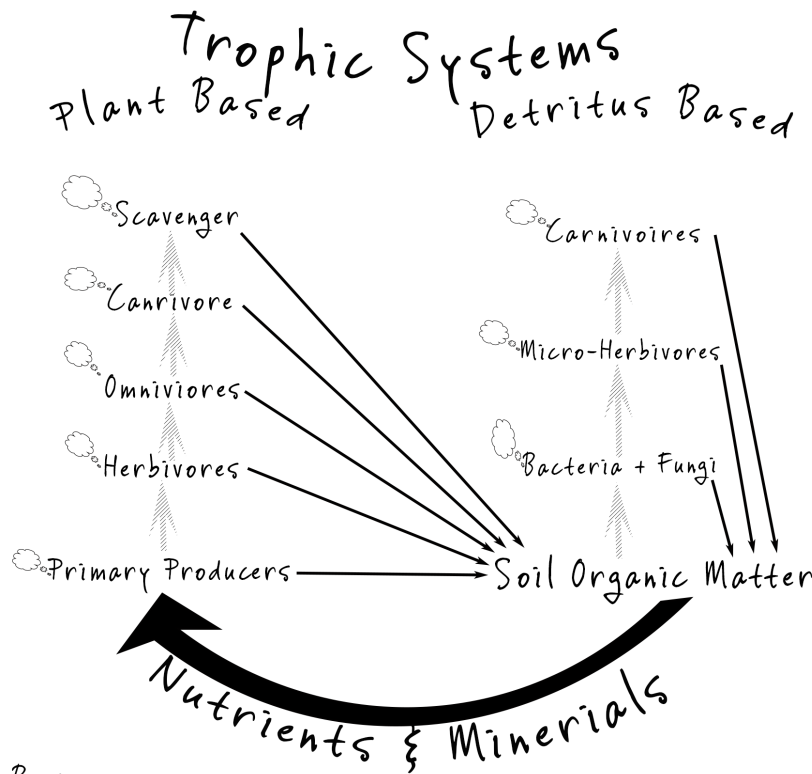
Producers are plants & algae who synthesize sunlight, CO_2 and H_2O into the organic molecules that form the base of our food system.

Animals who eat the producers (herbivores), Or who eat the ones who eat them (Carnivores), or somewhere inbetween (Omnivores)... But they all feed their wastes to the decomposers.

Bacteria, Fungi, Archea, and soil animals who live off waste from both producers and consumers, and in doing, breaking the waste into smaller and smaller pieces until it can be re-assimilated by a producer, and re-enter the food chain.

the Sky
Gas exchange occurs at all trophic levels

She kept going to and reading about differences between plant-based and detritus-based trophic systems, noting the decomposers tendency toward zero waste. 'One beings' trash is another beings' treasure' she thought with a smile, in the decomposers world 'one organisms' waste is another organisms' food.'



Both trophic systems create energy rich organic waste...
 But because the decomposers feed off of these wastes,
 soil organic matter is continually broken down
 untill it's small enough to be taken back up by plants.

She learned that fungi form vast networks of underground hyphae that allow them to transport nutrients over significant distances to where they are needed... and this gives fungi a distinct advantage over bacteria in nutrient poor environments.

Thinking about bodies again, she imagined some oyster mushrooms colonizing a dead tree in the forest behind this library, they grow

something like a vascular system the permeates the dead log and sort of turns it back into a living body. Smiling she thought, 'When a tree falls in the forest, for how long will its body remain dead?'

Bacteria, on the other hand, are small and prolific, and they can colonize a rich substrate incredibly fast...and thus tend to be the dominant decomposer in nutrient dense areas where food

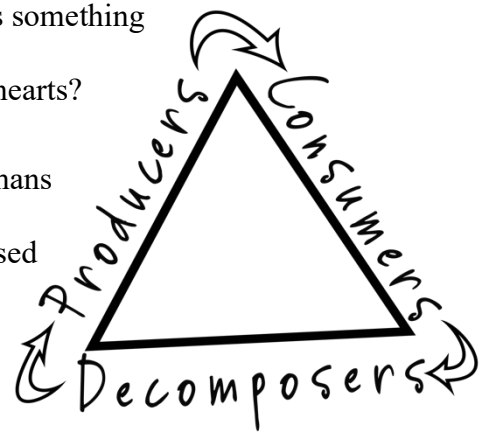
is a plenty. She discovered that they could team up with each other, creating ‘biofilms’ in which many species of bacteria all live together in a “matrix of Polysaccharides secreted by the bacteria” acting “as a consortium, where each produces only some of the enzymes required to break down the macromolecule... It’s like an assembly line” and it doesn’t work unless all do their job.⁵⁷

Hero thought about how when a building is under construction, a whole team of people comes together, all with different specialties, each responsible for different aspects of the project: plumbers, electricians, structural engineers, painters, etc. The list could go on for a building, but really the analogy could apply to just about any built-thing. We build things as individuals, groups and societies. We build everywhere we go, sometimes with physical things and others with linguistic schemes. We built the periodic table of elements, the international space station, and the alphabet.

This synergy of specialists working together to achieve something they couldn’t manifest as individuals isn’t just a human thing if bacteria do it too. That’s something to ponder...Is collaboration a pattern older than hands? Or even hearts?

This reminded her about what the gardener said about humans and decomposers as symbolic opposites—decomposers are obsessed with breaking things down while humans obsess over building things up. For a moment Hero saw it: they were like our other

half. If we are the builders of this Earth, they are the un-builders. We construct while they

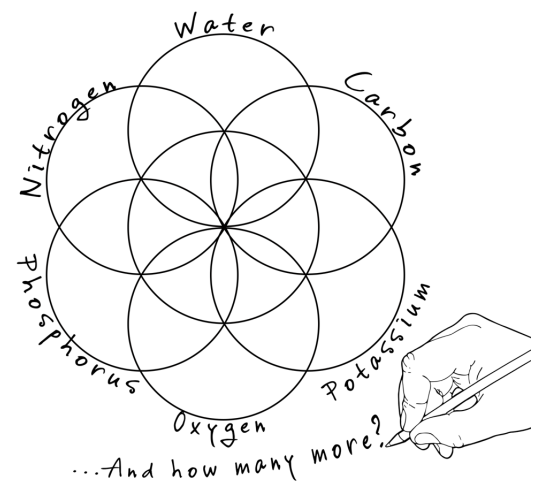


⁵⁷ Chapin, Matson and Vitousek (2011) *Principals of Terrestrial Ecology*, 2nd ed. Book. p.186

deconstruct. We compose while they decompose. They are, in some sense, the yin to our yang, or vice versa.

But this image was fleeting, as trophic categories came flooding back to mind: Producers, consumers, and decomposers. There were three roles to play, and while within our civilization we play both producer and consumer, in the broader context of life on Earth we are just consumers. To the extent that we produce anything, it's food for the decomposers.

The circles of life. She reflected back to something the gardener had said. Circles. There are lots of nutrient cycles. Water, carbon, nitrogen, and phosphorus--each has its own respective biogeochemical cycle which harmonizes momentarily in the bodies of living things, but each eventually circulates through environments in a distinct trajectory. We live in the places where these trajectories coalesce into bodies.



Sketching a flower of life, Hero imagined each of its circles as representing these different nutrient cycles. Of course, it was not scaled proportionally, but perhaps that symbol really did possess some integral bit of wisdom about how the world works.

She had grown wary after seeing it commodified time and time again. The paradox of the revolutionary artist, she thought, if the revolution is successful, their aesthetics will inevitably become aesthetics the state.⁵⁸ She wasn't religious, but after the seeing something like the flower of life plastered all over products at the mall, it became much harder to see any

⁵⁸ Nikolas Haraszti (1987) *The Velvet Prison: Artists Under State Socialism*. Book.

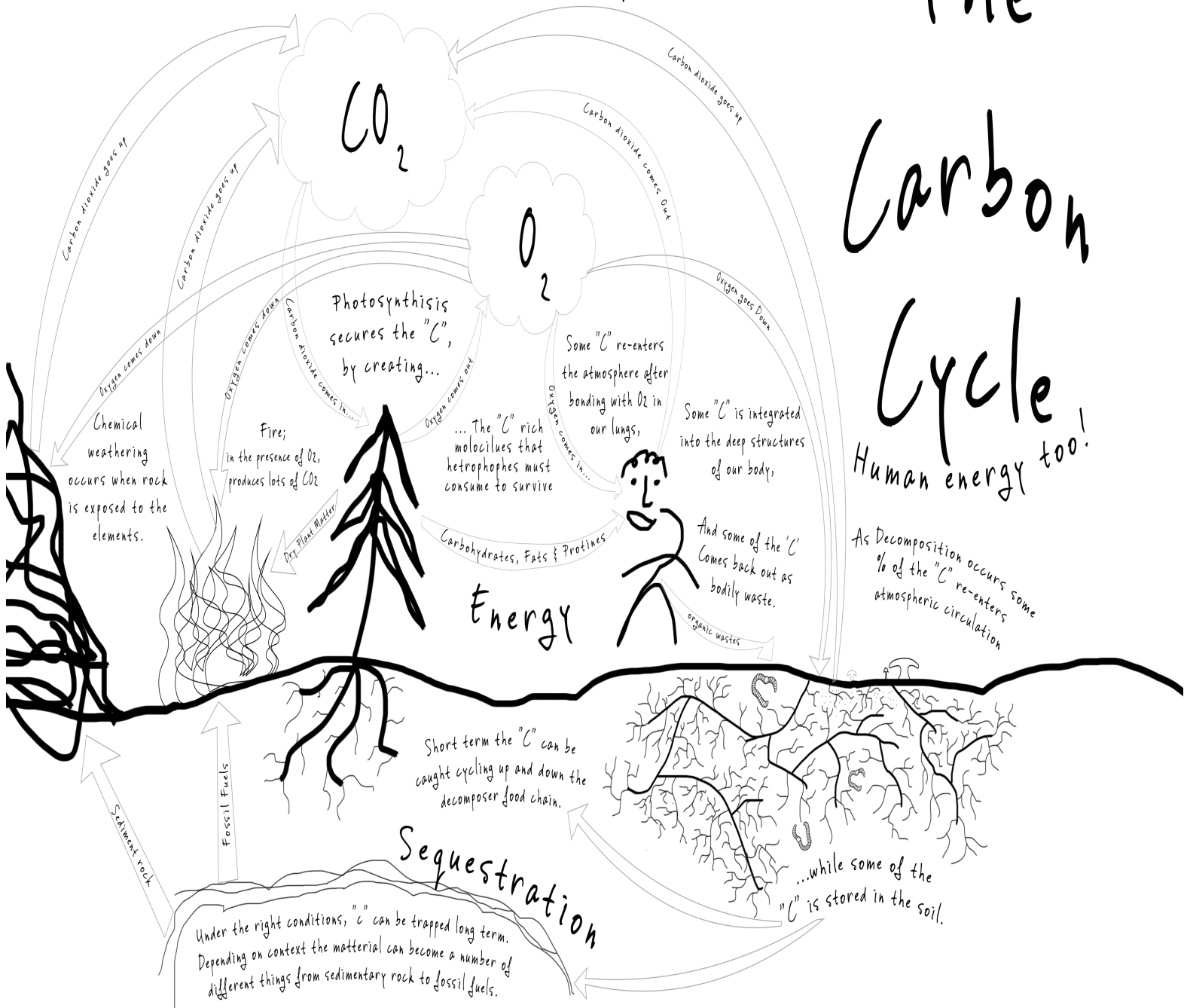
enlightened value in the symbol. She remembered seeing an Andy Warhol collection at Walmart, the giant Curt Cobain portrait in the McDonalds lobby, Chevron/Exxon using the tagline ‘Human Energy™’ at the end of all their commercials... Any successful bit of symbology seemed destined to become symbology of the successful. ‘Thou shall not worship false idols’ — but capital was just so good at appropriating aesthetics. Smiling to herself as she remembered that the people who took that passage most seriously in an aesthetic sense, also happened to produce some of the most awe-inspiring geometric imagery.

Catching herself with realization that her mind had wandered off on a tangent, she turned her attention back to her stack of books and started reading about the carbon cycle. Going back and forth from textbook to notebook, sketching out carbon cycle. It was a big system, and her notes quickly filled a whole page.

The Atmosphere

The Carbon Cycle

Human energy too!



During photosynthesis plants capture carbon from the atmosphere in the form of CO₂ and use solar energy to split the C from the O₂. The O₂ is released back into the atmosphere--this is where the oxygen we breath comes from! But following the C into the plant, you'll see it gets combined with H₂O, making any number of carbohydrates: 'C_xH_xO_x' she thought, visualizing the potential chemistry in her head.

Autotrophs (plants) have an ability to capture and store energy through this process of photosynthesis. With little exception, life forms that can't produce their own energy this way (by capturing and storing sunlight) survive by consuming something that has already done the hard work of securing the carbon into a useful molecule.⁵⁹ The later are "Heterotrophs", and they survive by eating plants, or animals that ate plants, or the dead or digested remains of either of the former groups. animals contribute to the carbon cycle through respiration. We breath in O₂ and exhale CO₂, which reenters atmospheric circulation. Some carbon remains in the organic materials, and while respiration continues throughout the decomposition process, some carbon is also stored in the in the topsoil as soil organic matter where it can reside long-term or be taken back up by plants.

Hero read about the nitrogen cycle too. Nitrogen is everywhere. Our atmosphere is made of 78% nitrogen, and even though human beings are only 3% nitrogen, it's really important for us. And like the carbon in the atmosphere, we only have access to bio-available forms of nitrogen by eating plants, or animals who ate plants. The interesting part is that even the plants can't capture nitrogen directly from the atmosphere. The nitrogen in the air is triple bonded N₂, and thus really hard to separate. The only organisms that can split the N₂ bonds of atmospheric

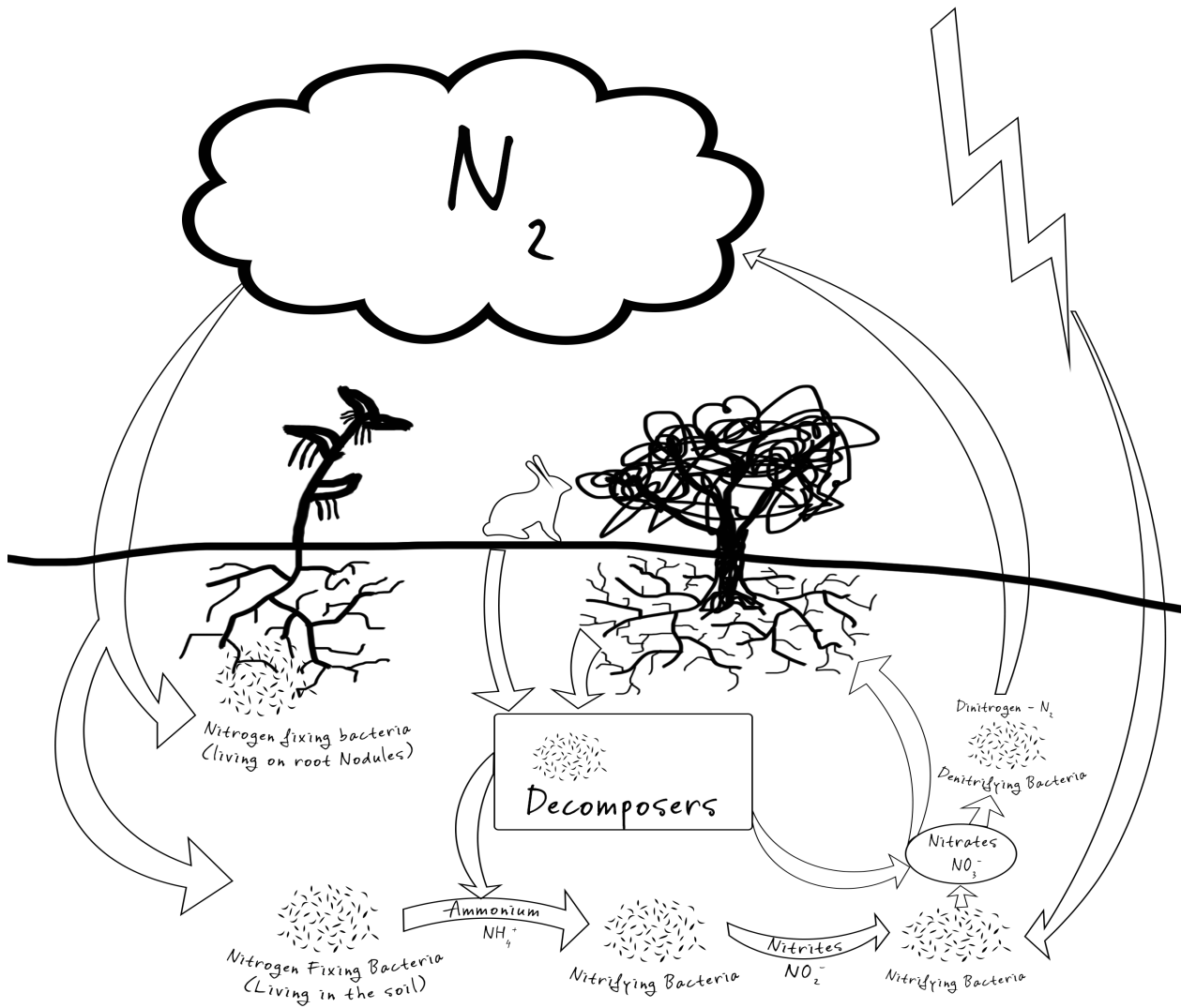
⁵⁹ The little exception in this case is organisms making food through chemosynthesis as opposed to photosynthesis. These are generally bacteria and archaea that live in very extreme environments such as deep-sea hydrothermal vents or inside volcanos.

nitrogen are bacteria that use an enzyme called ‘nitrogenase’ to create NH_3 (ammonia), which, when mixed with water becomes NH_4 (ammonium), which plants can assimilate. Nitrifying bacteria also turns NH_3 into NO_3^- and NO_2^- (nitrates and nitrites respectively) which are then taken up by plants. This process of is called ‘nitrogen fixing’.

Nitrogen fixing plants are species (mostly in the legume family) that have developed symbiotic relationships with nitrogen fixing bacteria that live on their roots. Other nitrogen fixing bacteria just like to live in the soil, while cyanobacteria fix nitrogen in the oceans. Once fixed, nitrogen can cycle up and down through the trophic levels of producers, consumers, and decomposers, many times. Eventually it will find its way to denitrifying bacteria that will bond nitrogen atoms back together and rerelease N_2 gas back into the atmosphere... The cycle starts again.

Interestingly, Hero discovered the only other known natural means of splitting atmospheric nitrogen gas was lightning, which has enough energy to split the triple bonded N_2 as it shoots through the atmosphere. These newly freed nitrogen atoms then bond with water and eventually fall to earth as rain or snow. Hero had always enjoyed riding out the thunderstorms at her grandparent’s house in the Midwest, but she never imagined those bolts of lightning that split the night sky were actually splitting nitrogen on an atomic level...or perhaps more profoundly, that *that* nitrogen could be falling down with the rain in her grandmother’s garden, feeding the plants that would eventually feed her... potentially ending up embodied in Hero. There was

something really poetic in the thought and Hero suddenly became aware that she was eagerly awaiting the next time she would get the chance to experience lightning.



Phosphorus is yet another crucial element humans acquire and incorporate into their bodies as it cycles through ecosystems. Unlike carbon and nitrogen, phosphorus doesn't move through the atmosphere as it cycles, and although our lithosphere (Earth's crust) is abundant with the stuff, it's mostly stored in bio-inaccessible forms—trapped in rocks. When rocks are exposed 'chemical weathering' occurs releasing the phosphates, and many other trace elements and minerals.

Lithotrophs are the class of organisms that can consume inorganic materials through a biological process. The term "lithotroph" comes from the Greek terms 'lithos' (rock) and 'troph' (consumer) literally meaning "eaters of rock." These rock eaters include bacteria and archaea, and, like the nitrogen fixers, many have evolved into symbiotic relationships with other organisms. Once phosphorus enters the food chain, it cycles through the trophic levels until it ends up in a physical location out of reach of the decomposers— for instance becoming buried underneath sediment on the ocean floor— where it begins that much, much longer journey transforming back into sediment rock, that will eventually be re-exposed to the elements and begin cycling again.

Nitrogen and phosphorus are both necessary building blocks for DNA—hard coded into nearly every cell in the body. Hero imagined the Venn diagram of the two cycles with her overlapping in the middle, one circle stretching into the sky, while the other moved down deep below the seas. Remembering her plea for a creation narrative, a story where she wasn't the invasive species, the alien invader.

She thought, 'I *am* made of Earth and Sky.' It sounded hokey even in her head. The kind of statement she would dismiss as so meta that it bordered on meaninglessness or irrelevance. But for some reason, thinking about it now, in the context of phosphorus and nitrogen cycles, it set her imagination on fire.

These cycles were not just things that occurred around her, she was actually an embodied participant. Embodied in the deepest, most dynamic sense of the word. Her body *was* the nutrient cycle; both in the sense she was made up of nutrients and that she sustained herself by continually eating and excreting nutrients. The eating looks inward at the structural elements functioning to maintain our bodies, while the excreting positions our bodies as one of the

structural elements maintaining our ecosystems. In fact, her lineage had been acting as consumers in the nutrient cycling markets long before anything like a currency or system of government had been established. For all of human history, we have been eating plants and other animals, and feeding the decomposers with our death, waste, and defecation.

She sat with that thought for quite a while looking out the window: All organisms are either consumed or they end up as detritus.⁶⁰

I am a consumer.

My people are consumers.

We eat producers and other consumers, and in doing so *feed the* decomposers...

In other words,

Maybe, the gardener was right, and applying composting is our role in the circles of life.



Hero left the library and, remembering her worms in the car, she took a detour so that she could walk by the dumpsters from the cafeteria where she grabbed a few five-gallon food grade buckets from the recycling bins. Again, the gardener was right— there was an abundance of them—so many foods these days came in these big buckets. Reading the labels, she grabbed two labeled ‘Minestrone Soup’, and two ‘Frying Oil*’ (with a little asterisk noting that the ‘oil’ might be a mix of any of the four different kinds of oil).

While walking back to her car she began thinking about the recycling system, and how the decomposers were kind of like Earth’s built-in recycling system. Except when you looked at

⁶⁰ Bowman, Hacker and Cain. (2017) *Ecology 4th edition*. Book. p.472-73

effectiveness of the two side by side, the human system was rather pathetic. Human production is fueled by the extraction of materials, of which a relatively small percentage end up actually being recycled into the feedstocks for new production or re-placed into the resource pool they came from.

On the other hand, organic production— anything alive— is mostly built with recycled nutrients, and it is only because the decomposers are soooo good at finding and eating detritus that the vast majority of organic production is recycled. Smiling to herself and thinking of the gardener, ‘it is much harder to stop the decomposers than it is to support them.’ We are sort of at war with them she thought as she pulled out of the parking lot.

A few minutes later, while stopped at a red light, she glanced over to her right and noticed two houses next to each other, with drastically different aesthetics—one was clean, with well-manicured lawn, a few freshly pruned shrubs and a large oak tree in the corner, along the fence that bordered the neighbors. The neighbor’s property was rather dilapidated looking, with the yard overgrown. One house was clearly much better than the other, judging by the today’s community standards—in a glance you can make a snap judgment about affluence of the respective residents, and you’d probably be right. She could just imagine that time-worn trope: the tension that may arise between neighbors over an unkempt yard. But this time Hero noticed that giant old oak tree and thought about the situation from its perspective.

Hero knew enough about trees to know that even though its trunk was in the neatly kept front yard, a large portion of its canopy, and more than likely its roots too, had reached across the property line into the neighbor’s yard. Hero observed that the ground in unkempt yard was covered in the decomposing remains of all those oak leaves that must’ve fallen almost a year ago. Indeed, it looked like the yard might not have been ‘cleaned’ for many years, the kind that would

drive the Dursley's crazy!⁶¹ But from the perspective of that oak tree, these are probably great neighbors. If I were an oak tree, the people that come and take away all of my leaves each season after they have fallen would drive me crazy. There goes my supper! There go my vitamins! Its like...

“Beep!”

Hero was suddenly reminded that she was sitting in traffic as the car behind her honked to get her attention refocused on the road. She got back into the rhythm of driving but her mind wandered again as she drove past an upscale hotel and saw a groundskeeping crew working the landscape. She found herself wondering about how much ‘yard-work’ could also be described as the ‘removing organic material’—which from an ecosystem services perspective, could be described as ‘removing the food for the decomposers.’ How many of the ‘jobs’ we have assigned ourselves in the urban landscape, are actually removing sources of nutrition from the soil?

Hero thought about the power dynamic at play: we’ll take the food now and bring you something else to eat later. But she didn’t think that was everything. People have created a system in which we assume it’s our responsibility to do the work of the decomposers. We take nutrients away in the form of organic material and then we add nutrients back into the soil as fertilizer. It seems more out of ignorance than malice— maybe we project the same relational dynamic between the decomposers and the producers, that we experience as consumers... but that’s just not how it works?

⁶¹ J.K. Rowling (2008). *Harry Potter and the Order of the Phoenix*. Book. p.39-54

From our perspective, the decomposers seem mostly a threat. Like the gardener said, they're constantly eating our food and shelters right out from underneath us! Once things start to mold, rot, and decay we perceive them as lost—and for good reason; they are mostly lost to us. But decomposing material is not lost to an ecosystem— quite the opposite. Decomposing organic material has been found. And found by a really important ecosystem process.

A basket of moldy strawberries might be useless to Hero, but they were still just as useful to an ecosystem. In fact, from an ecosystem perspective, the decomposers eating the strawberries is probably more important humans eating them. Lots of organic material goes straight from the producers to the decomposers. The niche we found is in the space between them.

A decal on the rear window of a car ahead of her caught her eye. It was the earth with a triangle of comparable size superimposed over it. She was struck by its similarity to a symbol she associated with Alcoholics Anonymous. The triangle within the circle. She remembered that in context the three sides of the triangle were each supposed to represent something, like three pillars of support: Recovery, Service, Unity... She muttered under her breath.

Following her earlier train of thought, she imagined that triangle represented the producers, consumers, and decomposers... the three pillars of trophic life that support the whole system.



Letting out a sigh as she parked her car, thinking about how many circles she had been through over the last 24 hours, she took a couple deep breaths and decided to let it be...

Realizing just how tired she was, she collected the worms and buckets from the trunk of her car, and walked up the stairs, mulling over a world so full of new experiences and exciting things to discover. But at the end of the day there was also something incredibly special about home: *like a little environment just for you.*

Waste(ed.) Home

Day 3

“Wherever the poetry of myth is interpreted as biography, history, or science, it is killed...To bring the images back to life, one has to seek, not interesting applications to modern affairs, but illuminating hints from the inspired past.”

—Joseph Campbell⁶²

“Do not fight forces; Use them.”

—Buckminster Fuller⁶³

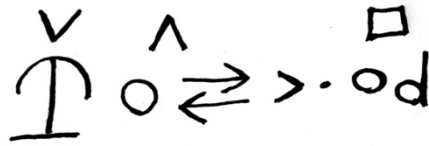
“I'm doing therapy in a different way, I'm doing a kind of therapy of ideas, what goes on in peoples' minds, the collective ideas that dominant the culture, like the idea of growth, and personal journey, and so on...”

—James Hillman⁶⁴

⁶² Joseph Campbell (1949) *The Hero with a Thousand Faces*. p.213 Book.

⁶³ Buckminster Fuller (2001) *Your Private Sky*; R. Buckminster Fuller: *The Art of Design Science*. Book. p.17

⁶⁴ James Hillman (1993) - *A Deeper Look* (hosted by Martin Wasserman). Radio Program.



Hero awoke to the familiar sound of 'Oh You Pretty Things' floating though the room as his alarm clock went off the next morning⁶⁵

"Wake up you sleepy head. Put on some clothes, shake off your bed"

had been the words that woke him up most days since buying this particular smart phone a few months back. The next lyrics almost always aligned with his next thoughts

"some breakfast and coffee"

Rolling out of bed and glancing at the morning sky:

"Look out the window, and what do I see? A crack in the sky, and a hand reaching down to me"

Remembering about the nitrogen, he imagined a lightning bolt cracking through the sky, as if a God were reaching down, handing us the building block of life,

"All the nightmares came today and it looks as though they're here to stay"

Those haunting clocks, those nightmarish scenarios, they're here to stay.

"I think about a world to come where the books are found by the golden ones, written in pain, written in awe, by a puzzle-man who questioned what we were here for"

Me too, Hero thought.

⁶⁵ David Bowie (1971) "Oh you Pretty Things" *Honkey Dory*. Song.

“All the strangers came today, and it looks as though they’re here to stay”

what if we are the strangers?

“Oh you pretty things, don’t you know you’re driving your mommas and papas insane”

Is it our parents? Or our family in a much broader sense that we’re driving insane?

“Let me make it plain, got to make way for the Homo Superior”

Homo Superior? No, make way for something like homo-symbiosis... That was the next stage of human development he was aiming for. Homo superior is a good way to characterize the last few hundred years of humanity.

“Look out at your children, see their faces in golden rays, don’t kid yourself they belong to you, they’re the start of a coming race”

What if this refers not only humans, but all children? Our siblings in the deepest sense.

“We’ve finished our news; the humans have outgrown their use”

Hero paused— now sitting up in bed.

If our lineages survive into the future for anything close to the amount of time they have survived in the past, we might look back at this era of human development as not only causing mass extinction, but also as the beginning of a new era.

We are both the cause and consequence of novel selection pressures. Consciously or not, we choose which species will have a place to live. We select wild animals through conservation projects and land use changes, and domesticated ones as either pets or sources of food. It’s the difference between weeds and crops, pets and pests, endangered and invasive species. Would

the Pigeon Paradox bring about a new era of conservation?⁶⁶ An era that drew connections between the species occupying urban and wild environments? Hero certainly hoped so. But it was all too easy to imagine how we drive our family — in the *Life on Earth* sense— insane.

Putting on some pants, his slippers and sweatshirt, Hero went to the kitchen, put some water on to boil, and went to work grinding some coffee beans on an old hand crank coffee grinder purchased at an antique shop a few months back. It was a nice physical wakeup exercise before the caffeine kicked in. The kettle boiled. He poured the water over the grounds and watched the steam rise off the top as the coffee dripped below. The smell was intoxicating. Hero could feel the anticipation growing.

When it finished, he grabbed the filter full of ground and caught himself halfway to the trash can with the thought, ‘Wait! This is food for the worms.’ Pausing awkwardly for a second in the middle of the kitchen, Hero changed direction, grabbed an old yogurt container from the cabinet, poured in the grounds, and placed it in next to the sink. Getting a Sharpie from the drawer, he wrote “WORM FOOD” in really big letters on the side of the container.

Grabbing his coffee, Hero returned to his bedroom and typed “how to make a worm bin” into YouTube. After watching a few videos Hero understood the basic idea. He was a bit surprised how easy it would be. He just needed to drill a bunch of holes in three of the four buckets, and one of the lids. Hero only needed one lid, so the other three would end up in his own recycling bin. He would need bedding materials too—it seemed about 3/4 should be something carbon rich, like saw dust or coconut choir, neither of which Hero had. Another video suggested cardboard, or unwaxed paper. The paper could be printed in black and white, so long

⁶⁶ Dunn, Gavin, Sanchez, and Solomon. (2006) “The Pigeon Paradox: Dependence of Global Conservation on Urban Nature.” *Conservation Biology*. Journal Article.

as the printers used soy-based inks. Hero happened to know that the college's sustainability policy required it to stock all the printers on campus with soy-based ink and so he was struck by the image of feeding his old homework to the worms.

Of course, he'd need food scraps too, but he'd already started with the coffee grounds, and he'd ask Grace if she'd save the pulp next time she made a juice, which she had been doing almost daily since their community supported agriculture group started delivering the previous month.

Getting to work, he grabbed the buckets and washed them with soap and hot water in the sink. That proved to be the most challenging part of the whole process because the apartment sink was not designed to wash something that large. Still, he figured out a process, and was at the point of rinsing the last one when Grace walked in, and said,

“Good morning,” followed up a couple seconds later by, “That might be easier in the bathtub.”

“You're right. Wish you'd walked in here 20 minutes ago,” adding, “I'm just about done with the last one.”

“What are you workin' on?” asked Grace.

“I'm making us a worm bin.”

“Oh, that's exciting! I like Vermicomposting!”

“Really, I didn't even know it was really thing until yesterday,” said Hero.

“Well, my community college had like six million worms that ate our cafeteria food waste. It was like a little on-site recycling facility. I went through the

Sustainable Works program there and they were super into it. We used to joke that worms were our real mascot.”

“Wow, six million? How big was that worm bin?”

“It was about the size of the of small shipping container, maybe 10ft x 25ft...sort of looked like a giant tanning bed... Where are you planning on putting our new worm bin?”

“I was thinking the balcony. The Gardner—who gave me the worms—said she has one inside, and online there are definitely lots of other people who do too, but I don’t necessarily trust myself to get it right at first so I’m going to start out there and see how it goes.”

“Sounds good.”

“And I was going to ask also, will you save the pulp for them next time you make a juice?” Hero asked, gesturing to the container labeled “WORM FOOD” next to the sink.

“Sure—that’s what I came in here to do.”

As Grace made juice, Hero drilled, and ten minutes later they were done.

Grace was sipping on her juice and Hero was mixing the coffee grounds with the juice pulp in one of the buckets.

“How was that lecture last night?” Grace asked.

Hero thought back, the auditorium seemed so much further away than it actually was. It had been less than 48 hours ago that he'd tried to convince her to come with him. "It was kind of depressing to be honest," he replied.

"Hmm," Grace hummed in an empathic tone, "like depressing new stuff, or just the same old depressing stuff?"

"It's the same old depressing stuff," He responded, looking up from his concoction. "I asked a question; I probably didn't articulate it very clearly. I wanted to ask if people who had read her book ever started crying when they met her. I feel like *This Changes Everything* belongs in a genre of dystopian non-fiction. But in answering... she said something like, 'I don't understand why people think it's too sad, I only put like three pages of scary climate science in there because I didn't want to scare people' and there was something about that just got to me, and I don't think I heard much else."

"Yea, from what I remember of that book, it was pretty depressing. As I recall, it was about us knowing exactly how scary climate change was many decades ago—when we actually had a chance to stop it. But we gave the World Trade Organization the power to create legally binding agreements and made all of the Intergovernmental Panel on Climate Change accords voluntary."

"Yep, that's it in a nutshell," replied Hero.

"Well, you know the college probably videotaped it, you might be able to go back and watch it—that might be interesting," Grace said.

Pulling in, he was struck by the size of the parking lot. The building had the footprint of a Walmart Super Center, but it had a parking lot with like 30 spaces. Stepping out of the car, Hero was struck by an air, rich with a pungent, and yet interesting smell. Not nearly as strong as manure, but nonetheless definitely there.

As he walked in, a woman behind the desk caught Hero's eye... "We just spoke one the phone? You're here for the tour, right?"

"Yes." said Hero.

"Ok, you made it just in time—not that joining in the middle would be the end of the world but this way you'll get the full experience."

Standing, she walked out from behind the desk and gestured to a group of people on the other side of the lobby, "That's the group you'll be joining. I let them know you'd be coming when they arrived, and they seemed happy about it... Let's get you a name tag."

The receptionist handed over a clipboard with a bunch of 'Hello my name is...' stickers and a Sharpie. Hero obliged, hastily writing his name on one and sticking to his chest, before they went to join the group. The receptionist said, "Oh there's Alice," as a woman in a forest green uniform walked through the double doors near the group, lowering her voice as they got closer, "You're lucky, she's been involved with this project from the beginning. She'll never admit it, but I'm not sure this place would exist as it is without her."

As they reached the group she said, "This is Hero, he'll be joining you; and this is a local homeschooling group."

A girl who looked to be about 11 years old, piped up, “We’re actually *unschoolers!*”⁶⁷

It was the sort of blunt correction that only a child can pull off without coming off as snarky and rude.

“Oh, yes, *unschoolers.*”

The guide said correcting herself, looking as though she was happy to say it, but still not completely sure of what it meant.

“Oh, it’s fine.” Said a woman who, by sheer resemblance must have been the girl’s mother, which was followed by a silence just long enough to qualify as awkward... before it was broken by the woman in uniform jumping in to introduced herself and formally begin the tour.

“Welcome to Dillinger County’s Organics Management. My name is Alice, and I’m the facilities manager here at DCOM. We started planning this facility six years ago, and we opened our doors, or more appropriately our tipping floors, almost four years ago now, and we’ve already processed well over half a million tons of organic material! We are one of the most sustainable utilities in both an ecological sense and an economic one. That is to say, we make money on both ends, people pay us to haul away their ‘waste’ and then we transform that material into a product that we can sell. Before we had this facility, we were paying a private company to take the waste away, and then, too often paying them again for the finished product as fertilizer for our gardens. It might not be obvious, but we actually use a lot of compost in Dillinger county, and by internalizing the

⁶⁷ Unschooling is a very particular educational philosophy characterized by the complete lack of compulsory education. It’s worth noting the I unschooled from K-12th Grade: No adult forced me to learn anything until I started attending community college at the age of 18.

whole process we're able to sell ourselves what we need at cost, and sell the rest on the open market, which allows us to significantly offset the collection fees paid by the residents. Your bill went down, and our bills went down. It was really a win-win situation. There's such a high demand for this stuff, that all of our compost for the next year is already sold. If you're a resident, and you just want a yard or two, that's always fine, but if you're a farm that wants 500 yards, you've got to get in line."

"Two yards? Like a front yard and a back yard?" asked a boy with puzzled look on his face who appeared to be about 8 years old.

Smiling, the guide replied, "Oh no, completely understandable, but here 'yard' means a specific amount, like an inch, or a foot. A yard equals 72 cubic ft."

Looking around she added "It's much smaller than most front or back yards, I don't see a good reference in here, but as we walk through the facility, I'll try to remember to point one out."

"Other questions?" Alice asked.

When no one else spoke she continued, "Well, I usually like to start out these tours with a discussion about just what exactly composting is, because well, it's a little bit of a tricky term. It's tricky because while it does mean something very specific, there is significant diversity in ways of composting. Here at DCOM, we are constantly monitoring and testing to make sure our process is 'composting' material according to strict quality control standards set by federal and state agencies.... But for you, composting can mean any number of things.

I like to use the analogy of baking. When you're baking something, say a cake, you mix the ingredients together in specific amounts, and then you control for time and temperature and moisture, and at the end poof! All of your ingredients, under the right conditions have recomposed themselves into something tasty.

With composting we're generally doing the same thing with the opposite intention. That is to say, we're taking this raw material and mixing it together in specific ratios, controlling for time temperature and moisture, then poof! under the right conditions that material will have decomposed into something tasty for the plants. In this analogy, DCOM would be something like the Wonder Bread factory, operating at high efficiency and producing very large quantities of a homogenous product. But just as baking at home can lead you on all sorts of different adventures, so can composting.”

“What is ho-mo-genius?” the same boy asked.

“Oh yes, it means the same, or very similar. It's very important in business, especially when you're selling a lot of something. You have to make sure it's all the same quality. Does that make sense?”

“Yea, I think so.”

“So, if want to bake something, the first thing you need to do is find a recipe get the ingredients. The thing you will find in most composting recipes is the need to get the right balance between carbon rich and nitrogen rich materials—what we often refer to as the C:N Ratio. In the context of compost, the ingredients come in all different forms— but the basic thing that ties them together is that they are

organic material. And by organic, I mean that the material was derived through life; not organic like you'd find in the grocery store.

For us, this material basically comes from two sources: yard waste and food waste. We refer to these as feedstocks. Yard waste generally is much more carbon rich, and food waste is generally rich in nitrogen. Getting the ratio right is important if you want to optimize the process...Any questions?" Alice asked again, and when no-one else respond, she continued, "Okay right this way... On this tour, I'm going to show you our process, and then at the end we'll look at some other small-scale examples of other composting processes."

And with that, she led the group through a door, up a flight of stairs, down a hallway and into a second story room with a giant plate glass wall looking over the back of the warehouse. It was pretty staggering. One moment they were walking through a nondescript hallway that could have been any one of a million different businesses and then all of the sudden they walked through a door, suddenly overlooking a Costco-sized warehouse alive with little people and big machines. It felt a little like a scene from Star Wars, in the command room of the Deathstar, looking out over the flight pad. The room was filled with all sorts of complicated looking electronic equipment. Four different people sat at four different workstation stations with multiple big monitors in front of each of them.

"This is our initial processing area. This is as close as we're going to get to this part because it's too dangerous to take groups though that scene." Continuing, "Here are Matt, Krishna, Leo and Sam," she said gesturing to the people at desks who had turned briefly as the group came in before going back to the computer screen in front of them.

“They’re all working hard, so we’re going to try not to bother them.”

Pointing out the window to the far back of the warehouse where daylight shone through big rolling doors Alice went on,

“That’s the tipping floor, it’s where the trucks come in and dump the material.

The first check is just a visual analysis of the materials done by two employees walking the pile and looking it over for contamination. They're checking for a few things. First for large items that could damage the equipment and obviously don't belong there. Four days ago, someone pulled a microwave out of a pile on the tipping floor! They’re also checking for any hazardous wastes like paint or motor oil... So, they're always looking for things like that, but they are also making an overall judgment as to the relative contamination of the load. Any load we judge as over 10% percent contaminated goes right to the landfill.

Fortunately, we do pretty well, and we only have to landfill a couple of trucks per week, which is a relatively small number. We're hopeful that we can keep bringing that number down as time goes on.

After a load makes it past the tipping floor, an operator uses one of those big dozers, to load the material into this big shredder, it works like a giant blender.

The material goes in one side and it comes out the other all shredded up and mixed together.”

Moving towards one end of the room, Alice touched a giant TV screen mounted on the wall, waking it up to show a security camera style grid of live video feeds from around the facility. Touching one of the frames made it jump to full screen, showing a close up of a trash truck dumping out a load of organics on the floor.⁶⁸



After a couple seconds, she switched views to a bulldozer dumping the material in a giant machine.



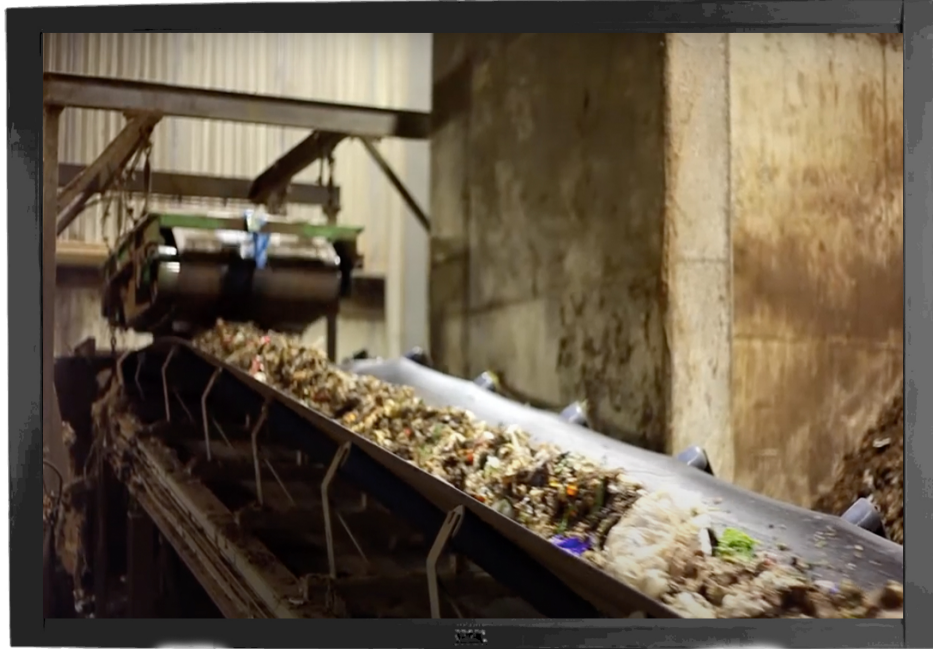
⁶⁸ The images that appear on DCOM's video screen are still's taken from a video titled, "Tour Hamilton's Central Composting Facility – Educational" which is posted on the City of Hamilton's official YouTube page in 2017. Ontario, Canada.

‘Feeding the robots’ Hero thought as the wastes dropped out of sight. Alice flashed quickly to a conveyer belt filled with raw material and said, “This is where the material goes into the shredder.” Before switching the video frame again, and letting her voice get a bit more animated, “This is where I think the really cool stuff starts.”



“This is the shredder...The video doesn’t really do it justice, those blades area lot more intimidating in person, but you can get the idea. It’s basically a giant industrial sized blender. This is an important first step in the process—by grinding up the waste into small pieces we maximize the area available for bacteria to colonize,” adding light heartedly, “if a tree falls in the forest, it will decompose much faster if you turn it into wood chips,” before switching to yet another view of the conveyor belt full of shredded material passing under some contraption mounted over the stream with large rotating belts the width of the moving belt.

Switching the video feed to a new screen she continued,



“Now look closely here; this is actually using magnet to pull out metals... Which is good because you don't want scrap metal in your compost. It's a safety hazard because it gets pretty sharp as it goes through the shredder. A good compost will probably have some trace metals just in much smaller particle form, and in very low concentrations. It's good because plants need the metals in trace element forms; Zinc, Copper, and Nickel all can be necessary for plant growth—and for that matter human health. If you could read the ingredients list in a compost, you'll see overlap with some of the things for sale on the supplements aisle.”

Adding, “Of course we also do batch testing to make sure there's nothing particularly harmful in there. We make sure our finished compost meets both federal and state agency standards.”

Switching to yet another screen, Alice went on, “I think this might be the coolest piece of technology.” The video that now showed a sort of waterfall for the stream of organics, where there appeared to be a thousand different little metal straws pointing toward the falling material.

“This optical sorter is an automated air-jet system that removes plastics, and a few other contaminants. Basically, it's a high-definition camera feed of the waterfall where the computer can identify contaminants and shoot them out of the stream with hyper targeted jets of air.”

Gesturing back to the screen it was clear that this machine was doing an inhuman amount of work. It was hard for Hero to track any one piece of contamination as it fell, but this computer seemed to be consistently identifying a dozen every second or two. Brightly colored chips of



plastic that moved fast, and scraps of plastic bag that had a much more meandering path down once they had been separated from the stream. It reminded him a little bit of that old arcade game Duck Hunter.

“After this, the material goes through a series of screens that separate the stream out by size. The largest materials get looped back around and put back through the shredder mixed in with the fresh stuff, and the smaller materials go out of the building on this conveyor belt, over to our outdoor section where we build windrows, and the *real* magic happens.” Flipping to a screen showing a conveyer

belt moving the material right out of the building, she added, “In the baking metaphor, everything up to this point has been preparing the ingredients, and now we move to the oven, so to speak.”

She led the group back down the stairs and out of different door to the side of building.

Outside, the group saw the conveyor belt coming right out of the building, near the top, and extending about 40 feet, supported by a welded trellis. It dumped the material over the side of a giant concrete wall into a huge pile. As they kept walking, their perspective changed, and you could see that there was a bulldozer scooping stuff up from the bottom of the pile and carrying it out of sight.

Alice brought them slightly further away from all the action, to a small shed that she now opened so that Hero can see it was filled with bright orange safety vests,

“Now that we’re outside, we’ve all got to put on one of these,” she said, waving everyone over to get a vest and pulling the radio off her hip, she said, “Safety Alert: I’m taking a school tour through the outside section, you know what to do!”

It took a second for everyone to get vests because the shed was only big enough for a few people at a time; Hero looked out over the scene. The covered area seemed the size of a football field, maybe more, and it was filled with long rows of composting material. You could see the steam rising off the compost piles even on a day when the temperature was in the sixties. There was some machinery on the far left, but for the most part this was just giant steaming heaps of compost.

After everyone had their vests on, Alice said “Okay let's go take a look.” She led the group over to the corner of the pad so that they can get up close to one of the big piles.

“Like I said, there are a bunch of different ways to do composting on an industrial scale. A lot of that facility design and process really depends on your particular situation. For example, if we were not in the Pacific Northwest where it rained so much, we wouldn't have had to build this roof...Efficiency was also really important to us. We wanted to be able to process as much material as fast as possible in a limited space. We operate on a 30-day turnover, which is about as fast as you can get in the industry, and we achieve this in large part by combining two commonly used methods, forced aeration and turning the piles, we've created a very efficient process.”

Gesturing to the ground she said, “Look closely at the floor and notice all these little holes? There is a 1' x 1' grid of 1/4 inch holes in the ground that spans this entire area's floor. The holes actually serve dual purposes. Do you remember from my baking metaphor there are four environmental factors that we need pay attention to when making compost: time, temperature, moisture, and aeration? These little holes what help us control both the moisture and the aeration.”

Bending down to touch one of them she continued, “These holes actually suck air in like a vacuum, so that when you put a big pile on top of them, they pull air down through the pile and over to that big bio-filter over there—” as she pointed to a large silo shaped thing with a vented top. “—where any foul odors are pulled out. It is basically just layers of wood chips and activated charcoal. And it might not seem like it now because we're standing so close to these piles, but it actually does a surprisingly good job.

I'm watching development of carbon sequestration technology and am hopeful for that at some point we will actually be able to run that air through some sort of carbon capture process. For now, it's way too expensive, and frankly, when we get there, we should outfit power plants and incinerators long before composting facilities...But it would be great because a lot of that oxygen we suck through the pile bonds with newly freed carbon atoms and becomes carbon dioxide. In a sense, the compost pile breathes— O₂ become CO₂ as a consequence of the biochemical interactions involved in just living.”

Alice paused to let that sink in for a moment before continuing. “One of the cool technologies I’ll show you later is what’s called anaerobic digestion, which is what happens when you decompose material in the absence of oxygen. The newly freed carbon tends to bond with four hydrogen atoms instead of two oxygen atoms, creating methane (CH₄) which we can capture and burn as you would ‘natural gas’. We looked into that for this facility but to do it on the scale required a bigger capital investment that we could afford...” Her voice trailed off as if lost in a memory.

“But,” she went on, “this piece about the difference between aerobic and anaerobic decomposition (that is with or without oxygen) actually gets at a really important point about throwing organic materials in the trash. Any ideas why?” she asked turning to the group.

Hero knew the answer. He knew landfills were a significant source of methane, although he’d never looked too closely at the organics in them. It was just another numeral on ‘landfills

are bad' clock Hero projected onto every trash can he saw. As Hero was busy not speaking up, one of the parents said,

“I’m going to guess there’s not a lot of oxygen in the landfill?”

“Bingo,” Alice exclaimed! “There’s not a lot of oxygen in the landfill. You can see what we go through here to keep the piles aerated, but in a landfill, material is just dumped, compacted, covered with something else, compacted, and on and on. Landfills have been known to spontaneously combust deep underground.⁶⁹ This is a big problem, because methane is about 25 times more powerful a greenhouse gas than CO₂⁷⁰, and landfills are responsible for about 12% of global methane emissions.⁷¹ New landfills are being designed with methane capture systems, and old ones are being retrofitted—which is good. But it’s still a little unclear exactly how efficient those retrofits are, and frankly I’m a little hesitant to fully endorse infrastructure that requires us to keep putting organic waste in the landfills. The point is, when you have organic material that you need to dispose of, the choice between landfilling and composting is the difference between sending a significant portion of that waste’s carbon up into the atmosphere as CO₂ or CH₄...and in the context of climate change that actually makes a big difference.”

⁶⁹ Shadi Y. Moqbel (2009) “Characterizing Spontaneous Fires in Landfills.” PhD. Dissertation.

⁷⁰ Intergovernmental Panel on Climate Change (2007). IPCC Fourth Assessment Report: Climate Change.

This number is worth elaborating on as there is some variance in the literature, and it is worth understanding how it is calculated based on CO₂^e which assumes the 100yr warming effect of a CO₂ molecule as its baseline of 1. My understanding is that CH₄ is closer to about 84 times more powerful a GHG than CO₂, but (and this is an important ‘but’) CH₄ being considerably more reactive than CO₂, persists in the atmosphere for considerably less than 100yrs. Thus, CO₂^e calculations must distribute CH₄’s warming effect over a time period longer than it is likely to actually be floating around in the upper atmosphere.

⁷¹ Paul Hawken (2017) *Drawdown: The Most Comprehensive Plan Ever Proposed to Reverse Global Warming*. p.100

After pausing for a second, she added, “I am hopeful that one day throwing organic waste into the trash will carry the same cultural taboo as throwing recyclables in the trash. I started out working in the recycling system, and I have a lot of respect for it, but I fear we missed the forest for the trees. Plastic, metal, and glass are very useful for us—don’t get me wrong—it’s good for us to re-cycle them. But *that* recycling system is entirely a human construction. It recycles the things that humans make. Composting, on the other hand, is the recycling of the things that make humans.”

Looking at the pile she said, “It is hard to see, but I promise you; this pile is filled with trillions of microorganisms actively recycling the materials that life is made of: calcium, nitrogen, carbon, phosphorus, iron, and zinc to name a few. This pile holds the building blocks for your DNA. You cannot access them directly from the compost, but you can feed the compost to the plants and eat those plants or feed the plants to animals and eat the animals, and in doing so, some of the elements in this pile of compost will become the elements in your body.

Composting facilities like this of course are human constructions, but decomposition functioning as an ecosystem level recycling system has been happening since long before even the dinosaurs walked the Earth.”

“That’s probably enough eco-philosophical rantings... I have a tendency to go off on tangents.”

“Oh, I enjoy your rants,” said Hero from the back of the group.

“Me too,” chimed in a couple of the others.

“Okay, well, where was I? Yes, the other function of all these holes in the ground is to help us maintain the appropriate moisture by draining off any excess water. Too much water and you end up with the same lack of oxygen problem that ends up creating methane. So, the excess falls through these holes and is redirected out that way— pointing behind the building—to where it’s run through another bio-filter — a densely packed bed of wood chips— and then eventually back into our retention pond, that feeds the sprinkler system. And so, when it’s too dry, we turn the sprinklers on and wet the piles down a bit.”

Looking up, Hero could see that there was vast sprinkler system running along the ceiling, kind of like the emergency sprinklers in an office building, but more, a lot more.

Alice walked towards a gadget on a stick poking out of the pile a little way down the row, “These sensors are all wirelessly linked to that control room we were in, providing hourly data on temperature, oxygen and water levels.”

As she pulled the sensor out, Hero noticed that the stick on the end was actually taller than he was. It was thin, and looked flexible, like a tent pole, “These take readings at two feet, four feet and six feet so we’re getting readings from different depths in the pile, and we can make adjustments as needed.”

She put the sensor back in the pile and walked toward conveyer belt coming out of the first building. The group followed. Hero pondered the difference between the recycling and composting in the American psyches, and, laughing to himself a little, realized it was quite simple. The tree didn’t have a corporate lobby maintaining propaganda machine. Hero knew the history, the emphasis on ‘consumer recycling’ in American culture was a well-organized and ongoing campaign funded mostly by the companies making the products people were being

encouraged to recycle.⁷² Recycling created the illusion that the downstream consumer was in the power position and in doing so absolved the producers of any responsibility. ‘It’s absurd!’ thought Hero. They successfully framed the issue as the consumers response-ability to fix a problem with a supply chain. It seemed an age-old trope: some humans invent something that has benefits, but also creates problems, and once they see the problems, they invent something else that solves the problem by making it somebody else’s problem. The dreaded Treadmill of Production!⁷³

Around the corner of the concrete wall, out of the pile of fresh material accumulating underneath the conveyor belt, came a woman on in a bulldozer. She looked up and waved as the unschoolers and Hero came around the corner.

“This is Titania, she’s building piles today,” Alice said as they walked over. “As you can see this is where all that freshly prepared material from inside transitions into the next phase of the process.” Asking, “Where are you building right now?”

“C4,” Titiana called back.

“Okay, we’ll follow you.” And then turning back to the group Alice said, “Step over here for a second, we are going to watch Titiana picked up a load, and then follow her over to the pile she's building right now.”

It was loud behind the front loader, but Alice yelled over the engine as they walked, “All of these piles are arranged in rows A through J, going this way” gesturing to their trajectory. “Each row has 6 piles, or at least space for them,

⁷² Andrew Boardman Jaeger (2018) “Forging Hegemony: How Recycling Became a Popular but Inadequate Response to Accumulating Waste.” *Social Problems*. Journal Article.

⁷³ Schnaiberg, Pellow, and Weinberg (2001) “The Treadmill of Production and the Environmental State.” Book Section.

starting at number 1 on the far left, and number 6 on the far right.” Adding, “The pile where we started walking was numbered A1, and we’re on the way to C4.”

Now that they were walking, the sheer size of the piles and rows of compost looming overhead felt a little ominous. Like a corn maze. Or better yet, a labyrinth. Maybe there was something magical inside. An image struck Hero and he was lost momentarily in a daydream, thinking there could be a sphinx — no, not a sphinx, a giant worm— lurking around the corner, standing guard to the circle of life armed with a riddle to test the seekers as they tried to pass. Thinking about it for a second, Hero settled on “*Who eats? When the fourth letter gets their meal on the house while trying way too hard to be cool?*” as the riddle his giant worm might ask would.⁷⁴

As they reach C4, Titiana dumped the load onto a half-built pile, waved and drove off, Alice started talking again,

“So we have 60 piles here, and we operate on a 30 day process, so, when everything is operating as it should, which luckily has been most of the time so far, we’re starting and finishing two piles a day. Over here you can see the beginning of the process. Take a close look at this material, you can see that it's freshly shredded, but you can still kind of make out a lot of different organic materials.”

“If we take a quick walk over to this pile,” she said while walking to the next one down the line, “you’ll get to see the pile we’ll harvest tomorrow. Take a look, it’s pretty striking how much the decomposers can do in 30 days.”

74 D (fourth letter) Comp (Getting a meal for free at a restaurant) Poser (the aesthetic quality of trying too hard to be cool).

Alice was right. It was almost unrecognizable as the same stuff. The only thing that was still recognizable was some little wood chips, although they had changed from the light browns of freshly cut wood, to the rich dark color of humus.

Hero thought about the groundskeepers he'd driven by the night before and wondered if all that 'food for the decomposers' being extracted from the environment was being brought here, to what seemed like a decomposers paradise? It seemed likely, and also sort of comforting.

Last night it seemed we were starving the soil, and now it seemed a little more like we were cooking for it, albeit it was perfectly capable of cooking for itself, and hadn't ask us to do this... but still, this seemed a far better system then Hero had been imagining.

Hero giggled to himself. Thinking this was something like a decomposer farm. He had dreamed for years about what it would be like to grow lots of food in urban areas. Looking at the huge piles Hero realized that food was growing all around Him, most of it just wasn't food for people, but food for the decomposers.

Alice was talking about temperature, but Hero was a lost in a vision. All those haunting clocks, those ticking time bombs of civilization. They seemed so easy for so many to ignore, and yet inescapable for Hero. The experience was actually quite straightforward. Hero had series of visions, except instead of the haunting doomsday clock, Hero saw the Word "FEED" projected over all the materials composting around him as he imagined them appearing in his everyday life, and the lives of the million or so people surrounding him. Those coffee grounds from this morning—still food. That pizza box from the other day wasn't just carrying food, the box itself was food! Food for the millions of organisms feasting around him. How many people realized that on the other end of that 'green waste bin' there are hundreds of millions of hungry microbes excitedly waiting to devour to feed on what you put into it?

“Any Questions before we move on?” asked Alice.

“Yea, actually” Hero said, his stomach tensing slightly, “This might be a little random, but, the people on the other end— the ones throwing this stuff away— how many of them do you think realize that the stuff they throw in the bins is about to become food for trillions of microorganisms living just outside of town?”

He continued, “Like, as opposed to thinking about this system from more of a non-biological perspective—we take this product, break it down and turn it into a new product kind of approach.”

Noticeably thinking about it for a second she said, “Hmmm, I would say most people have a pretty low-resolution understanding of what’s going on here. We do our best to educate people, but they have to be interested. I do think the way composting is framed can make a big difference. That reminds me of my granddaughter’s preschool—they have a composting system there— a backyard bin, and collection bowls all around campus. When my son arrived, the system wasn’t being used that much, the collection bowls would sit around too long, and emptying them always fell on the parent assigned to clean up duty. But my son, being *my* son, re-labeled all the collection bowls as “Bug Food” and started emptying them during the school day and making a point of announcing, “Time to feed the bugs!” every time he did it... and well, that’s one of those phrases that’s bound to spark some movement in a group of preschoolers.⁷⁵ Basically, nothing about the system changed except for the name, and the positive projection of one

⁷⁵ This little aside actually holds the genesis of this Novel. Sometime around 2013 while I was teacher at a cooperative play-based preschool, I relabeled all the compost collection bowls “Bug Food” and started announcing, “time to feed the bugs!” near the end of each day when I emptied them into the big compost bin in the back. It worked. I never forgot how effective that subtle linguistic reframing was at shifting the culture around composting. Years later I picked up on this idea in graduate school and ran with it.

individual that it was a fun and interesting activity. So yes. Consider what would happen if you change the labels of all of our official collection bins to read ‘Bug Food!’ I honestly think we would see a shift in the culture, and probably less contamination, but making that change is not exactly within my power... I’m only responsible for the material once it gets here. And, well, you gotta pick and choose your battles.”

Hero made eye contact for a second and nodded in thanks. The group kept walking for a while, a couple rows this way, a couple that way, and finally came around the corner of a pile to see a giant machine straddling one of the piles. It was bizarre looking, like something out of a Transformers movie, with tires about the size of Hero. Gesturing to the monstrous machine, Alice informed them it was that it was called “a windrow-turner” and went on to explain,

“This is a super special and expensive machine. It probably costs as much as most houses, and the routine maintenance on it costs about as much as a luxury car! We shut it down when we’re doing tours— it’s loud and the operator has pretty poor visibility, which makes it dangerous. But basically, it has a bunch of rotating blades that run between the legs—mostly buried in the pile right now, but you can see them in the ends over there. As it drives down the row, it mixes up all the pile really well, and provides extra aeration. Each pile will go through this machine three times—at 5, 15, and 25 days. The combination of this and the forced aeration through the floor makes our 30 day turn around possible. You could easily operate a facility using either of these methods exclusively, but it would take closer to 45 days for the material to fully decompose. For us,

investing in both was well worth it. This machine is a beast, I wouldn't want to be anywhere near those blades when this thing gets going”

Hero had a brief flash of himself standing in front of such a machine, the sheer proportion of such a thing felt like it was straight out of terminator movie—from the timeline after Skynet took over the world.

“Let's keep going” Said Alice, “I'm supposed to keep this tour to around an hour and we're pushing that now.” As she led the group all the way through the facility, and out the



back to where there was another giant machine. It had two different conveyer belts coming off it, going in different directions. The machine was running, building piles of compost under each of the belts.



“This is our final screening area, it's the last stop for compost before we send it out into the world.”

Pointing to the giant machine, she continued, “At this point we separate the material into two different streams. The fine stuff is our class A material that you would put in your garden or will get used on farms—Picking up a handful she said—You can also buy this stuff from us for \$5.35 a yard every Friday and Saturday from 8am- 3pm, just bring the truck and we can load it up for you.”

Walking over to the other pile She went on, “This stuff is our class B material, it’s much woodier, and it gets used a lot more in non-agricultural uses, like the sides of freeways, and parks, and stuff like that. Storm water management too. This stuff can slow runoff, improve drainage and mitigate soil erosion. We also take a couple scoops of this and put it back in the shredder. In doing so the finished compost acting like a starter culture that gets ground up and distributed throughout the all the fresh materials as they come into the facility. This helps keep the process on schedule by making sure that new piles are colonized ASAP by the species we're reintroducing— It’s like with a sourdough or kombucha, or Soy Sauce. We use the majority of finished product but mix a small portion back in with fresh ingredients to make more. This is a good practice for any home compost too! Mix some finished compost back into the fresh stuff and it’ll make a big difference.

I should be honest though; we also sell a lot of this class B material to the local landfill for use as alternative daily cover...” looking as though she knew she’d have to elaborate of that last sentence, she continued. “Basically, landfills are required to cover up all the materials they dump on a daily basis, and they use this class B material to do that. They need to use something, and we produce much

more of this class B stuff than we have market for. So, for the time being that's just a part of the system. Probably the part I'm least happy about."

After pausing again, Alice continued, "Let's see, I think that's about it for our main process, let's walk around this way and I'll show you a couple of the specialty processes."

As they followed her around the back of the facility, she shouted back, "Any more questions?"

One of the parents took her up on the opportunity and said,

"You mentioned using charcoal as part of the filter for the air and that comes off the pile, could you say a little more about how that works?"

"Yes! Of course, the charcoal we use is called activated charcoal, and its different then briquettes you would buy in the store. The thing about activated charcoal is that it is basically pure carbon. You make it by heating wood up to a really high temp in an environment without oxygen. It's called pyrolysis. What happens without oxygen is that instead of catching fire, a chemical decomposition occurs. And, well, everything gets transformed into gases except for a large portion of the carbon, which remains as activated charcoal or sometimes it's called bio-char. It's widely used in filtrations devices, if you have a home water filter, activated charcoal was probably a main ingredient. It's also used in agriculture to increase soil fertility and slow run-off... I was just having an interesting conversation the other day with a friend about the ancient use of biochar as way of increasing soil fertility in the Amazon rainforest.⁷⁶

⁷⁶ Shearer, Apfel-Margin, and Tindall (2017) Sacred Soil: Biochar and the Regeneration of the Earth. Book.

The metaphor I like is that of a battery. We're basically keeping most of the storage capacity by preserving the carbon structure, while removing the other elements, which leaves us with a microscopic lattice-like structure with a strong negative charge. When you push air or water through activated charcoal, any contaminants with a positive charge will bond with it and remain in place for quite a while." Adding, "in an agricultural context we can charge the biochar by mixing it with compost, or even synthetic fertilizers, where it will basically do the same thing, but then once mixed in with the soil, it can slowly release these nutrients over long periods of time... as well as minimizing fertilizer runoff—which can also be a big problem." Finishing with, "Does that make sense?"

"Yes, thank you," said the parent who'd asked the question.

"Hum, let's see," continued Alice, "I think I've covered it as far as our main process goes... Any more questions?"

Hero raised his hand, looking around first in case anyone else had question before saying, "I guess, just thank you, I really appreciate you doing this tour and that I was able to join last minute, this feels kind of magical how you take all the county's green waste and transform it into compost. I would have never even thought to reach out if my roommate hadn't been on a field trip here last year, so glad I did."

"Thank you" Alice said, "I appreciate your enthusiasm, but if you think this is magical, you really should visit the waste-water treatment plant, because they're the ones composting all the county's human waste."

“Yeah!” piped in one of the kids, “We went there last week, and it was really cool. The beginning smelled really bad, like a poop factory, then the rest wasn’t so bad. They had killer lights at the end. That was my favorite. Did you know the fountain in front of the Children’s Museum comes from toilet water? But, like, they clean it really well and stuff, with the killer lights too, so we can play in it!”

“No, I didn’t know that,” replied Hero. “I’ll definitely look into that...I had no idea.” Thinking that the recycled water in the fountain was intriguing, and he was a bit clueless about the ‘killer light’— although the idea of composting the county’s human poop was rather fascinating.

“Yeah, well, it can be a controversial issue.” Alice added, “Sewage treatment usually flies a little under the radar because generally people are happy with flushing it ‘away’ and really not that interested in the particulars of what ‘away’ actually looks like in that particular context—out of sight, out of mind, you know? Who wants to imagine where that stuff they flushed down the toilette this morning is now?”

Hero kind of liked the idea but could very well imagine people being disturbed at the practice of composting municipal sewage, he said, “Reminds me about how most toilet paper is made from recycled material, but if you look on the shelves, you’ll probably only find a couple of brands actually advertising the recycled content.”

“Yep,” said Alice. “Most people don’t want to think about wiping with a recycled product, just as most people don’t want to think of their poop as food for

something else. Personally, I find it kind of comforting, you know, eating plants and animals, digesting what you can, and then feeding the rest to the decomposers has been in our lineage for millions of years. The real change has been devising ways of *not* recycling our poop.”

“Are all waste-water treatment plants creating compost out of sewage sludge?”

asked Hero.

“Oh, no, not all of them. A fair number end up sending the biosolids to a landfill or incinerating them, but I think you’d be surprised, it’s not as rare as you might think.” Alice said, “But sewage treatment is always interesting... You will almost always find a waste-water treatment facility to be a collaboration between biologists and engineers. Almost all waste-water treatment plants will cultivate a specific microbiology in order to neutralize pathogens and homogenize the sludge. But it takes some extra steps if you want to meet the safety standards for producing consumer quality compost, and those steps can be expensive, so in addition to cultural taboos, that can make Class A Biosolids, colloquially known as ‘humanure’ a bit of a challenge. After all the primary objective of a waste-water treatment plant is cleaning the water. It’s been a while, but the last time I looked into the literature, something like 60% of the biosolids created in the U.S. were eventually applied to the land as a fertilizer⁷⁷”

Hero got a little lost in his thoughts as they continued their walk around the back of the facility.

⁷⁷ Erik Apedaile (2001) “A Perspective on Biosolids Management.” *The Canadian Journal on Infectious Disease*. Journal Article.

‘Human waste is food for the decomposers.’

‘Pooping is part of the circle of life.’

If making peace with the decomposers was the goal, then feeding them seemed like a worthy strategy. Was offering your enemy food not an effective way of initiating peace? Is there a more powerful gesture in conflict resolution than the gift of good food? What if we had spent a trillion dollars feeding people in the middle east instead of bombing them?’

It was kind of amazing. Two days earlier Hero felt like everything he ever did was causing harm—like humans were separated so far from nature that it seemed impossible to bridge the gap. But now, Hero was increasingly aware that he stood at just such bridge: truckloads full of human generated waste were being dropped at one end, biochemical transformation was occurring, and then food for the soil came out at the other end.

They arrived in front of a long slowly rolling tube that must have been eight feet in diameter. It looked like a grain silo laid flat and rotating like hot-dog in a gas station hot case.

“Can anyone guess what this is?” Asked Alice asked gesturing to the contraption behind her.

“Another kind of filter?” asked a girl with brown braids.

“Nope.”

“A worm bin?” suggested Hero.

“No again, those are good guesses, but this technology is called ‘In-vessel livestock mortality composting.’ It was developed on large scale factory farms as a way of dealing with dead animals. We end up using it for roadkill. Deer mostly. Some opossum, squirrels. It’s also available for deceased pets or farm

animals. Not too many take us up on that though. When they do, it's usually chickens. Lot of families have been getting chickens for the first time. That's great and all—I have chickens, too—love them—but every so often we get a panicked call from someone who woke up to discover an embodied experience of 'the fox in the hen house trope.' I'd say 95% of what we compost in here is collected by one municipal branch or another.”

“So you just put the bodies in there?” one of the parents asked.

“Yes, with lots of wood chips... Sensors monitor the temperature, aeration and moisture, and we adjust those variables as needed, and its kept separate from the rest of our stream because there are some added dangers we need to look out for when we're dealing with whole carcasses, but yes, everyone from farms, to meat processors, fisheries, to municipalities like us employ one version or another on animal mortality composting.⁷⁸”

“I read in the newspaper a while ago that there's a bill being considered in the state legislature that would legalize composting as a method for disposal of human remains. Would that be in be something like this?”

“Oh yes, you're right, I've got to start saying that! Our state just became the first in the nation to legalize human composting! The governor signed SB 5001 into law last May.⁷⁹ It's all so new at this point, that I'm not sure exactly what the process will look like, but I'd suspect it will be something like this.” She added, “It's been illegal, so nobody could really study it, but that's going to change fast

⁷⁸ Bonhotal, Schwarz, and Rynk (2014) “Composting Animal Mortalities.” *Cornell Waste Management Institute*. Article

⁷⁹ On May 21st, 2019, Governor Jay Inslee signed SB5001 into law which legalized the 'natural organic reduction' (composting) as a means of disposal for human remains making Washington the first state in the nation to legalize human composting.

now... I think they did a study recently,⁸⁰ with special permission as part of this new law, but I haven't read it yet... So, we'll see what emerges... I think it's got a lot of promise."

'Human composting' Hero thought as they kept walking. That's an idea with some serious implications. It was hard to wrap his head around exactly what they might be, 'my body could be food for the decomposers!' This seemed to have practical implications for nutrient cycling, but Hero didn't have much time to dwell because they had arrived at the next, and last stop on the tour.

He found himself in a large covered hexagonal area with picnic tables. A large built-in countertop wrapped around the back three walls, incorporating a rather large BBQ and a big double sink.

"This spot is one of my favorites," Alice said, gesturing around, "This whole system is really here for you! We knew there would be lots of school tours in particular, and we wanted to have a place for you to gather and eat, debrief, hangout, and stuff. And so we decided to use it as one last opportunity to show off the usefulness of composting." She said, pointing behind the picnic areas a little way back, to what looked like a big above-ground swimming pool. There were holes coming out of the top and leading to what looked like a giant propane tank, which then hooked up the BBQ. More hoses ran to the back of the sink. Alice continued proudly,

⁸⁰ Carpenter-Boggs, Lynne (2020) "The Environmental Impact of Death, and the Science of Sustainable Alternatives." *Annual Meeting, American Association for the Advancement of Science.*

“This is called a Biomeiler, or the Jean Pain method, after the scientist who invented it. It captures both the heat and flammable gases generated through the decomposition process.⁸¹ Water is pumped through that big vessel to capturing heat as it goes. That closed top also helps capture all the flammable gases generated by the anaerobic decomposition. Here we have hot water leading to the sink, and the gas fueling the BBQ. In the 1940s, Frenchman Jean Pain met all of his household energy needs through this process. He even converted his car to run off of the gas this device generates.

I felt it was important to have examples of both heat recovery and gas capture onsite because even though we don’t employ either of them in our main processes, but they are used on various scales in industries all over the world. I think they teach a tangible lesson that’s really important. Here, we really focus on decomposition as it relates to the material re-cycling, but there is also a lot of potential out there for decomposition as a means of heat and energy generation.”

“What kind of industries would be using this?”

“Really anything that producing a large consistent organics waste stream. I think I’ve mentioned waste-water treatment and landfills, but also breweries, factory farms, food processing plants... Although it would look different, this is sort of a niche way of doing that mostly compost geeks and green energy historian types appreciate. It’s the kind of thing you could build on a homestead for grand or two. In modern industrial use people would focus on the anaerobic digestion part,

⁸¹ Jean and Ida Pain (1972) *The Jean Pain Methods or Another Kind of Energy*. Book.

harvesting natural gas and then using it to heat water to a conventional hot water heater. One of the cool things about getting energy this way is that it actually favors decentralization. What I mean is that transporting organic materials is really costly— both in terms of money and energy— so companies or farms usually have these digesters on site, where the feedstocks are generated.

(Remember I mentioned feedstocks earlier?)

In some cases, facilities are constructed where those raw inputs have already been aggregated through some other system. These places also often have their own energy needs that can be met with the gas generated on site. Most large machinery can be fueled by natural gas.”

“Doesn't burning natural gas also produces CO₂?” asked a girl to the left of Hero.

“Oh yes, very good. But think back to where that carbon started, as a truckload of organic material. I see that CO₂ is part of the carbon cycle in the same way I see all the CO₂ coming off of these compost piles. Yes, it is a greenhouse gas, but, like I said before, carbon is literally the stuff life is made of, and it's been cycling from organic material to atmospheric particle and back to organic material for a long time, a really long time. The problem we run into with burning fossil fuels is that we liberate the carbon that has been trapped underneath the earth's surface for millions of years— not the carbon circulating in and out of the atmosphere. What's so interesting about anaerobic digestion is that it directly engages the carbon cycle. The other piece is that the composted material you end up with — called digestate— is also carbon rich. Digestate can be applied to the soil just like

compost, so that some of the carbon can be taken up into the biomass or stored underground as soil organic matter.

In my opinion, there's potential for biogas energy to act as a carbon sink if paired with local efforts to increase soil fertility and boost primary production." Alice said beaming.

"Could we produce all our energy that way?" asked the same kid who'd wondered about a yard earlier.

"Well, no. We're not going to replace the amount of energy we're currently getting from fossil fuels with energy from biogas. But I think in the coming decades we're going to look back at 'all our energy'—that is to say, the amount of energy each of us uses—as absurdly large. Biogas isn't going to produce *that* much energy... But we're going to have to get used to consuming a lot less energy. Once it really settles in that we're going to spend the next few thousand years living in the Anthropocene, I think the amount of energy that we are producing is going to become far less important than the ecological integrity with which we produce it." She said gesturing around with her hands. "Clearly I'm biased, but I think that using bio-chemical decomposition as a means of energy generation is fantastic."

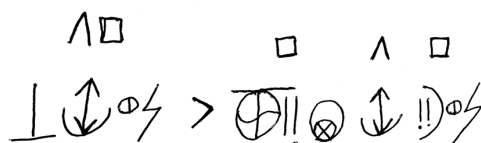
"It sounds really interesting." One of the parents interjected. "I didn't realize we had the ability to do that!"

“Yea, it's cool stuff. Typing ‘anaerobic digester’ into YouTube will send you down a quiet the rabbit hole!” Alice said, following it up with, “Did you bring anything thing to BBQ?”

“Yes, actually we did,” another one of the parents said pulling off his backpack, and pulling out a bag full of corn on the cob.”

Alice went on to unlock the BBQ, and they began grilling. Hero stayed for a while, munching on his cob on corn and having an interesting conversation about “unschooling,” which did turn out to be distinctly different home schooling.

As Hero walked back to his car, he felt that sense of hypocrisy for returning to one machine that contributes to climate change. Even in moments like this, perhaps most in moments like this—coming off of the high of visiting a place where ecological stewardship was valued— Hero felt the weight of turning that key, starting that engine, burning those fossil fuels



that had been trapped underground for millions of years.

But then, as he approached the car, a thought struck him, and he saw for the first time the connection between the piles of compost he'd just been walking through and the gasoline in his car. Fossil fuels developed when instead of doing everything you could to speed up the decomposition, organic materials got buried underneath the ocean floor, subjected to immense amounts of pressure, and heat, and well, time!

In some sense, he'd always known that his car— for that matter his civilization— ran off of energy that had been captured by plants and animals that died millions of years ago, but there was something about seeing all that energy radiating from the fresh compost piles brought *that* timeline to life somehow. It wasn't just a flat black line on a page. It had many dimensions.

He laughed a little bit realizing that the drug of choice among modern people was an ancient material that, through biogeochemical circumstance, escaped decomposition in its own time and had effectively been consumed by the Earth itself.

In some sense fossil fuels were a very particular kind of compost, or maybe a kind of anti-compost. The kind of compost so highly concentrated that you can light it on fire. Or it spontaneously combusts! Hero wasn't sure what to make of it, but there seemed something poetic there. He imagined a wine bottle labeled "Fossil Fuels" and "100,000,000 BCE" and smiled too himself, thinking it would be a fun art project to actually make those bottles. How many wine bottles full of gas would it take to fill up my gas tank? Maybe do that calculation and fill a bunch of residential recycling bins with them? Exploiting that trope—the alcoholic neighbors recycling bin. Seeing his car as a sort of ancient compost burning machine, he imagined, that maybe it would be best to have the back seat filled with the empty gas bottles.



Opening the door of the car and sitting down inside, he pulled out his phone and did some quick calculations:

$$((128 \text{ oz in a gallon}) \times (16 \text{ gallon gas tank})) / (25\text{oz in a wine bottle}) = ..?$$

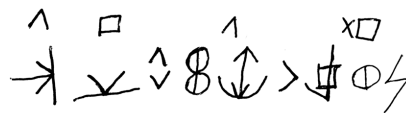
Oh god, he thought, putting his head in his hands as he realized that each time, he filled his gas tank he was putting nearly 82 wine bottles full of gas in his car. It was depressing, but it also would make the art piece all the more powerful.

Sitting there in the car Hero wondered about how much prehistoric plant matter got buried during the carboniferous period in order to create a gallon of gas? Again, realizing that his might hold the answer, Hero typed the question into the search engine, and found a magazine which made a claim so large he had to track down its source for himself. The article cited ‘Jeffery Dukes’ as the author of a new study aimed at answering this exact question. Hero switched over to the scholarly version of the search engine, and the name into search field... and sure enough, “Burning Buried Sunshine: Human Consumption of Ancient Solar Energy” appeared in the list of results. Clicking, Hero discovered he didn’t have access to the whole article, but the abstract was enough, it made two staggering claims, first that “Today's average U.S. Gallon of gasoline required approximately 90 metric tons of ancient plant matter as precursor material” and secondly that, “The fossil fuels burned in 1997 were created from organic matter containing [more than] 400 times the net primary productivity (NPP) of the planet's current biota.”⁸² He wasn’t ever sure which claim was more depressing, that filling his gas tank accounted for some two hundred thousand pounds of prehistoric plant material, or that globally were burning the fossil fuel equivalent of 400 times NPP annually. Hero knew the very nature of such research was imprecise, even Duke’s had been quoted saying as much in the magazine blurb, but there could be error bars of 80% and these numbers would still be absurd. It was hard to imagine the embodied energy of just one ton’s worth of organic energy—2000 pounds of material—being compressed down to a single gallon of gas.

⁸²Jeffery Dukes (2003). “Burning Buried Sunshine: Human Consumption of Ancient Solar Energy” *Climatic Change*. 61, p.31–44. Journal Article.

But, then again Hero thought, this is why fossil fuels are so addictive. They possess absurdly high concentrations of the active ingredient we're addicted to using. Something like the difference between a poppy seed and a poppy seed sized dose of Fentanyl... Would we ever break this addiction?

Maybe I am living through *The Last Hours of Ancient Sunlight*⁸³ he thought— before actually turning the key, firing up the engine, and pulling out of the parking lot.



Hero's next stop was the grocery store. He enjoyed walking through the aisles stacked head high with food, after just walking through the compost piles. It was funny to imagine that all this food was not just food for humans, but also food for the decomposers: people weren't necessarily the endpoint of this food system. Maybe I'm just another transition.

Hero also thought about the embodied energy necessary to achieve these food systems. Every single one of these products would have a unique supply chain that undoubtedly used energy in every step. The packaging, transportation, refrigeration, and harvest and processing were all energy-intensive processes. In a Life Cycle Assessment, the term 'embodied energy' described the sum of all these energy inputs along the supply chain. The numbers in most every case study Hero had read were pretty disturbing. There was an absurd ratio of upstream resource use to make the down-stream product.

⁸³ Thom Hartmann (2004) *The Last Hours of Ancient Sunlight: Revised and Updated Third Edition: The Fate of the World and What We Can Do Before It's Too Late*. Book.

Still, there was something else now; something underneath that vast energy infrastructure. Modern civilization runs on fossil fuels-- there is undoubtedly much truth to that. But walking through those aisles, Hero saw something for the first time. All of the food products themselves were filled with energy. It was that food energy—caloric energy—that actually fueled bodies. Although it may sometimes feel like it, *people* don't actually run off of coal or crude or natural gas.

Hero said under his breath “We are fueled with bio-energy! I fill my tank with proteins, fats and carbohydrates, vitamins and minerals too. We run off of the energy on these shelves, not necessarily the energy that brought them there.”

He looked around sheepishly. ‘I am to the grocery store what my car is to the gas station,’ he thought as he put some apples in his cart. He added cabbage and carrots, bananas and avocados too. He was struck by the thought that he knew much more about the externalities associated with these things than he knew about the intrinsic properties of them. ‘I know of the banana wars,⁸⁴ the thousands of miles this fruit must've traveled to get here, and about the fungus now threatening devastate global banana production.⁸⁵ But I actually don't know very much about the bio-chemical properties of this mysterious yellow fruit.’

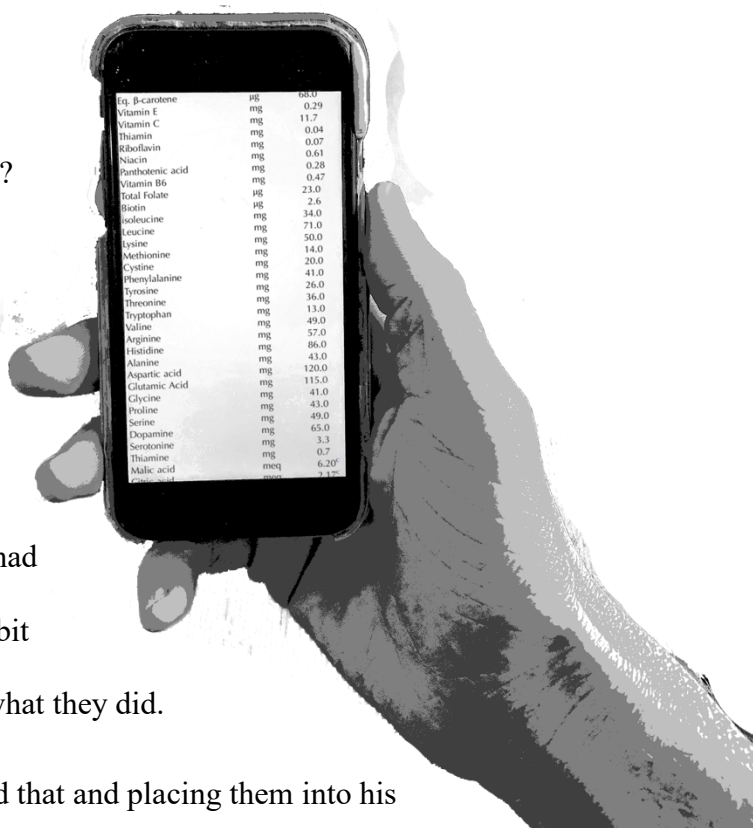
⁸⁴ Striffler, Moberg, Gilbert, and Rosenberg. (2003). *Banana Wars: Power, Production, and History in the Americas*. Book.

⁸⁵ Viljoen, Ma, and Molina. (2020) “Fusarium Wilt (Panama Disease) and Monoculture in Banana Production: Resurgence of a Century-Old Disease.” *The American Phytopathological Society*. p. 159-84. Book Section.

Then, realizing that he held a portal to the internet in his pocket, Hero pulled out his phone and typed “the biochemical properties of a banana” into the search engine. It linked him to an article on Research Gate with a table⁸⁶ listing no less than 39 different biochemical structures that could be found in a banana. They couldn’t even all fit on his little screen. A few of them sounded familiar — Carbohydrates, Ca, vitamin E, vitamin C— but the majority of were unfamiliar to Hero. What is Tryptophan? or Lysine? or Methionine?

Not wanting to spend an hour on his phone standing in the middle of the produce section, he placed the phone back in his pocket, thinking that he would return to this table when he had time to spend a couple of hours going down the rabbit holes each of these chemicals, trying to figure out what they did.

He kept walking the aisles, grabbing this and that and placing them into his cart. Then, there, on the canned food isle, Hero had a vision. He was looking at the wall of soups, when he realized that in some sense this grocery store, this wall of canned soup, was also a front line in the battle with the decomposers. The miraculous thing about these soups was not just that they had traveled thousands of miles to get here, on this shelf, but also that they had probably been cooked months ago and had not yet been eaten by the decomposers. The canning process kept them safe. Hero had spent a lot of time learning about all the problems associated



⁸⁶ Aurore, Parfait, and Fahrasmene. (2009). “Bananas, raw materials for making processed food products.” *Trends in Food Science & Technology*. Vol 20 p.82 “Table 3. Chemical composition and biochemical features of banana and plantain at different physiological stages, and after transformation, per100 g of fresh weight.” Journal Article.

with packaging, but somehow, he had never quite grasped that when it comes to food, humans had the power to create an impermeable barrier around the food in order to keep the decomposers out. He blinked, and in a flash imagined all the little bacteria and fungal spores floating around the store, waiting for a chance to break that barrier and find something tasty to eat.

It was strange to imagine the air inside a grocery store as full of microbial life. A little eerie really—the last thing Hero ever would have associated with a grocery shopping was the idea that it was a war zone in terms of microbes... He wondered under what conditions might society at large start really thinking about all the microbial life floating around in the air?



He had always focused on the absurd geographical distances that so much food traveled, but somehow, he had never quite appreciated the temporal dimension. If he could travel 1000 years back in time and show his ancestors this can of minestrone soup, would they be more impressed by the fact that it has ingredients from three different continents? Or by the fact that it had been cooked two years prior?

From an evolutionary perspective, it seemed to Hero that the ability to preserve food across time would have been incredibly valuable for our ancestors, especially as they moved away from the equator, and ventured into more seasonal climates. The ability to preserve food could have meant life and death in many circumstances. What would those early methods of preservation have looked like? Dehydration? Salting? And smoking? Could we even know what came first... Food preservation probably emerged independently across cultures... and well, and vast majority of evidence of these tactics would have been eaten by the decomposers.

He'd read a book last year all about the deep history behind the domestication of microbes in food cultivation, so he knew lots of ancient culture independently developed their own versions of fermented foods.⁸⁷ Kimchi, sauerkraut, beer, wine, and cheese are created by feeding raw materials to the right microbes in conditions that allows them to dominate territory—to the exclusion of any other microbes—effectively preserving the food by cultivating the right decomposers.

It was kind of beautiful how these foods exemplified what a symbiotic relationship with microbes could look like. In Asia, some soy sauce makers have been passing down their recipes, and the microbes that accompany them, on for many generations!⁸⁸ There are bakeries that have been using the same mother culture for 100 years!⁸⁹ Without microbes, our species would not know alcohol. Although passing by the beer and wine aisle, Hero wasn't entirely sure whether or not alcohol, on the whole, was good or bad for humanity.

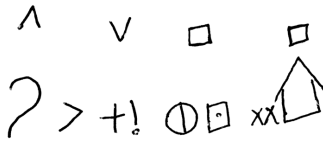
⁸⁷ Kathrine Harmon Courage (2019) *Cultured: How Ancient Foods can Feed our Microbiome*. Book.

⁸⁸ For example, the current head of Kamebishiya, Kanae Okada, is in the 17th generation member of the Okada family to run the soy sauce brewery... it's story much longer than a footnote, you can read more here: <http://kamebishi.shop>

⁸⁹ Boudin Bakery in San Francisco still uses the sourdough mother that Isidore Boudin first started collecting in 1849. I've had the pleasure of eating freshly baked sourdough from this Bakery and I must say it's fantastic.

Picking up a tub of yogurt, he thought this too was filled with life. It says so right on the label: “Live Probiotics & Cultures”. He flipped it over, read the ingredients on the back, and learned that he was holding “S. Thermophilus, L. Bulgaricus, L. Lactis, L. Casei, L. Acidophilus and Bifidobacterium.” He didn't really know what this meant but somehow felt comforted. The comfort was quickly replaced by a twinge of guilt when he thought about pouring it into the blender with the cabbage and banana later on for the smoothie he'd been craving. ‘What was the blender like for S. Thermophilus?’ he wondered.

Grabbing a loaf of sourdough bread and reminiscing for the days when he lived with a roommate who was an avid baker, he had a crazy thought: *A loaf of bread is kind of like a cooked compost pile.* To make bread we grind the grain into really small particles, then mix it



with water, salt, and microbes. As those microbes start to digest the flour and its sugars, they produce lactic acid which gives sourdough its taste, but they also off-gas in the process creating all these little air pockets in the middle of the dough. That’s why breads rise—at least the ones made with live microbes. It's like creating a compost pile with flour and water, kneading it to glutinous glob, and giving it just enough time to get going before we put it in the oven, killing everything and solidifying the structure of the loaf.

Smiling to himself and wondering if he’d ever be able to look at a loaf of bread and not see a cooked compost pile, Hero finally headed towards the front of the store and checked out.

In the parking lot he ran into his friend Esri. Hero was excited because in the minute or two that they had talked, she'd shared that she was in the middle of listening to a podcast called *S-Town*⁹⁰ that had been assigned for an environmental health class she was about to start.

“It’s good,” she’d said, “but I still can’t figure out what it’s got to do with environmental health.”

“Ohh its good, just wait!” Hero had replied, knowing exactly why it would be assigned for an environmental studies course, but not wanting to spoil the ending. They talked for another minute and made plans to meet the following day for lunch at the Casual Consumer downtown.

While driving back home, Hero reached to the center console and turned on the radio at what turned out to be precisely the right moment to get him headed down another rabbit hole.

"So, every surface, every bit of air, every bit of water in your home is alive. And every hour, every building we've ever studied all of those things are alive. So, the only choice you really get is 'which life?'. And so, when you study homes, different kinds of homes have life in different places, if you look in the hot water heater and there are microbes that have evolved to live in really high temperatures, if you look at your saltshaker you find bacteria Like the ones that live in salt flats in the desert. If you look in your attic, there are interesting bugs that you don't see elsewhere, in your basement, you see cave animals. and so, your house has habitats, and each of those habitats is little bit different. There are collectively across households hundreds of thousands of species, but the average house has thousands of species, and if you breathe in deeply right now Terry, just inhale—in that breath—what’s in your lungs at this very moment, are thousands of species...and a couple of them are bad news. Some of them you depend on; and most of them nobody has ever studied in any real way.”

⁹⁰ Brian Reed (2017). *S-Town*. Serial Productions. Podcast.

‘Thousands of species inside my house’ Hero thought as he heard Terry Gross’s now unmistakable voice go on to ask,

“Why are you studying them?”

“So, I started off studying rainforests. I was fascinated by the fact that you could turn over a leaf and every leaf seemed to have something new, and slowly my career drifted toward backyards. And then eventually I found myself in homes, with the realization that a lot of what I had done in jungles we could do under the bed, and in showers, and we were making the same kind of discoveries that I would be making in Bolivia or Ghana or Australia or somewhere. And so, it was this realization that there were these discoveries that people had overlooked right where I live, right where we all live. And that we could engage the public, in helping us make those discoveries, and once we figured that out it was hard to go back.”

‘Who was the guest?’ he wondered continuing to listen intently as what must have been an episode of Fresh Air⁹¹ kept playing.

“One of the things you have learned studying the micro-ecosystem of homes, is that there are microbes, that live in extreme environments outdoors—very cold temperatures, very hot temperatures— and our homes reproduce these conditions through things like the freezer and the boiler...”

“Could you elaborate on that?” asked Terry

“So, if you look at a traditional home from a couple of hundred years ago, it would've been relatively open to the outdoor environment, and the conditions in it wouldn't have been very much like the conditions outdoors. A little bit buffered, but very similar. But in our modern complex homes, we have actually built a whole bunch of little structures in the home that replicate really extreme environments from elsewhere on earth. Our freezers are kind of like the Arctic. Our ovens are kind of like really really hot deserts. And so, when we do that, we are actually creating habitat for species that like those conditions.

Scientists have discovered that many of the same micro-organisms found living in hot springs, could reliably be found in the hot water heaters of our homes. If you unscrew an American style shower head and look inside, you'll see a gunk, and that's a biofilm, and

⁹¹ Fresh Air (hosted by Terry Gross). “With Bugs & Bacteria Living in Your Home, You're 'Never Home Alone’” interview with Rob Dunn. WHYY. Radio Program.

that's a kind of apartment that the bacteria collectively excrete and then live in. That keeps them buffered from the flow of water. They live there and they eat essentially the nutrients that are in the water as it passes by on its way to you."

The guest (who was this?) went on to describe how a little bit of these bacteria trickled down on a person in the shower, but were almost entirely harmless, with the exception of some 'non-tuberculous mycobacteria' which we might be unwittingly selecting for by chlorinating the municipal water supply... Because these particular mycobacteria are chlorine tolerant, and when we kill everything else it leaves them with a wide-open territory, and it's a problem because these particular mycobacteria are associated with some specific lung infections.⁹²

He also talked about it as presenting,

"a really a great example of where we've gone too far, in trying to kill everything around us, and it's had unintended consequences. That's a story that comes up again and again. We get scared by the idea that there's life around us, we try to kill all of it, and in doing so we're more likely to make ourselves sick than well."

Such a wicked dynamic, Hero thought, 'We can't kill everything, but we try, and end up providing a wide-open habitat to whichever species is resistant to our attacks. Will we ever wake up and see that selection is an active dynamic that's also going to bite us in the ass?'

Terry went on to ask about "fungi in the house..."

"[Fungi in houses is a mixed bag] because if you open your refrigerator many of your food things have fungi in them that help to make the food themselves. And so you have these useful food associated fungi, in your beer, in your bread, but if you move away from your kitchen you also have fungi just sort of drifting in. And so we've found more kinds of fungi that drift into houses than there are named kinds of fungi in North America, which is partially just a reflection of how ignorant we still are about the biological world around us that there are more fungal life in house than we have associated with any name—let alone a good understanding."

⁹² Gebert, et al "Ecological Analyses of Mycobacteria in Showerhead Biofilms and Their Relevance to Human Health" *mBio*

‘They found more species of fungi in homes than there are named species of fungi in North America?! Could that possibly be real?’ The guest went on to describe how, through genetic sequencing, his team isolated thousands of different species of fungi in samples from homes all across the United States.

He then told a very interesting story about how the toxic black mold that claims so many homes appear to come prepackaged in the drywall. In a controlled environment, they found brand new drywall already had the spores inside of it. If the drywall stayed dry, the spores would remain dormant... But as soon as the drywall got wet, they sprang to life, and began consuming the house from the inside out.

Hero had lived in houses where black mold appeared, and this was exactly how it happened. It seemed to come from within the walls, and now he knew that in all likelihood that was indeed what was happening. It seemed a little crazy to hear that people would build homes using drywall at all in a place where it rained 200+ days of the year!

The guest then described how the wood in houses is often colonized with the mold spores in the lumberyard or during the framing process, and as long as it dries out completely those fungal colonies will go dormant. But once that wood gets wet again, they reemerge with a vengeance.

“That's one of the reasons it's so hard to study these things, the species that we find in homes might be heavily influenced by what happened to the materials 50 years ago...”

Hero was struck by the image. When you water the garden; it grows. When you water your house; it grows. In the war against the decomposers, we have already lost. They have already infiltrated our shelters, our territory. Our walls are filled with fungal sleeper cells just waiting for the signal to spring into action!

‘Just add water!’ He thought, the very simplest of instructions.

‘How many of our own food stuffs came with that printed on the box?’ It was funny to think about our walls in this way, as packaged food for the decomposers that would spring to life when wet.

The guest rambled on at length about what he called ‘the space station model’— which is when we basically get rid of everything except for the microbes associated with our bodies and our food. He’d said,

“If you look only at the microbial communities, it looks almost as if a human being has just decomposed.”

And then finally, Terry Gross finished with,

“Thank you so much. This has been an interview with Rob Dunn, author of *Never Home Alone*⁹³”

‘*Ah-ha!*’ That was piece he’d been waiting for—the keywords he needed to keep running down this rabbit hole in digital space. By this time Hero had arrived at his parking spot and was sitting there parked with the key turned halfway so that the engine was off, but the radio remained on. He turned the key the rest of the way and shut off the new voices now pivoting to traffic, enjoying the silence for a moment.

Although, that silence didn’t last long, because without the radio Hero noticed the squawking of a few crows, tearing apart a paper bag, and devouring what appeared to be a half-eaten hamburger and French fries near the dumpsters. Just a few days earlier it seemed that there was all the difference in the world between humans and all the other life on earth... But perhaps the line between humans and nature was fuzzier than Hero had previously imagined.

⁹³ Rob Dunn (2018). *Never Home Alone: From Microbes to Millipedes, Camel Crickets, and Honeybees, the Natural History of Where We Live*. Journal article.

It was so obvious once he saw it, but somehow, he had never quite appreciated that the built environment was not just a habitat for humanity. As he walked up the stairs, he thought to himself, ‘Maybe, just maybe, this is *where the wild things are*.’⁹⁴

⁹⁴ Sendak, Maurice (1963) *Where the Wild Things Are*. Book.

Feeding Whom

Day 4

"Dream is the personalized myth;
Myth the depersonalized dream"

—Joseph Campbell⁹⁵

"Healing more resembles the fluidity of storytelling
than the exactitude of puzzle assemblage."

—Chellis Glendinning⁹⁶

"Somebody's after me,
I can't pretend to be,
something I know I'm not."

—Cast⁹⁷

⁹⁵ Joseph Campbell (2008). *The Hero with a Thousand Faces*, New World Library. Book. p.14,

⁹⁶ Chellis Glendinning (1994) *My Name Is Chellis & I'm in Recovery from Western Civilization*. Book. p.146.

⁹⁷ Cast (1997) "Live the Dream" *Mother Nature Calls*. Polydor. Song.



Hero woke up with that awkward feeling in the center of her body. That feeling that inspired one to drag themselves — no matter how sleepily— to the toilet. It was there, sitting on the toilet, that Hero actually woke up. And in that moment, after letting go but before standing up, she had a flash of the previous day, and a vision of the sewage treatment plant with its billions of hungry microbes waiting on the other side of this massive underground sewage-system.

Just before bedtime the night before she had looked up the local sewage treatment plant's website and watched a short video that documented the entire process. It was the kind of educational video that reminded her of elementary school. She could still visualize those large vats of aerated sludge waiting at the end of the maze of underground pipes. What she had learned at the composting facility was indeed true—the Dillinger county water treatment plant processed sewage sludge into what they called “Class A Biosolids” which, as Alice had suggested, was the technical term for the highest quality of compost made from sewage.⁹⁸ On the website you could make arrangements to get the compost, but a little note had been added to the page that indicated they had a three-month waiting period.

Hero really wasn't sure how she felt about the contents of her toilet ending up in a garden. The toilet was really not the place where she had expected to find the circle of life, ‘But here I am, ‘feeding the earth,’’ she thought as she flushed and watched the water spiral away.

⁹⁸ In the United States, the production and distribution of Biosolids are strictly regulated by the Environmental Protection Agency. More interesting and fairly digestible information about biosolids can be found on their website: www.epa.gov/biosolids/basic-information-about-biosolids

Turning on the water in the shower she thought about the microorganisms living in the hot water heater, those creatures who until very recently had lived only in hot springs. Now they lived in little pockets of habitat scattered throughout human developments. How many of these symbiotic relationships with distant biological families were lurking in the shadows just out of sight?

The biofilms too, she thought, looking up at the shower head as the warm water ran down her body. She was pretty sure Rob Dunn had said something about how they could identify which part of the country you were from, and if you were on a well or city water, by examining bacterial distribution of the biofilm in *your* shower head.⁹⁹

She wondered, ‘When a new habitat niche is created— such as with the installation of a hot water heater or a shower head— how much time should pass before we consider those species that come to occupy the niche as native?’

In an established the ecosystem, the native species are the ones that have been living in a particular habitat niche for quite some time, while non-native ones have more recently entered the ecosystem and are competing with the established species for resources. When a new species turns out to be really good at outcompeting an old species, we call it an invasive species, and generally do our damndest to get rid of it! (unless, of course, the invasive species in question happens to be *us*).

But this question of non-native versus native species seemed a bit different in terms of the hot water heater because it was a new niche; *we built it*. The microbial communities in a hot water heater don’t compete with other microbial communities that have been established for

⁹⁹ Gebert, et al “Ecological Analyses of Mycobacteria in Showerhead Biofilms and Their Relevance to Human Health” *mBio*. Figure 4. Journal article.

thousands of years. The niche they're occupying only appeared once the hot water heater was installed. She thought, 'Perhaps a hot water heater should be considered a non-native environment?' Did such a term even make sense? Could a species be native to a novel environment?

It seemed to Hero that if people created niches with particular environmental conditions that would not otherwise be present, species that came to occupy those niches—in water heaters and shower heads, in freezers and ovens, in basements and attics— might be considered native species.

The hot water felt good as it ran down her body. As unnatural as it was, Hero loved taking hot showers. What a treat it must've been for her ancestors to find hot springs. She could understand why once they had mastered the technology; they would have put hot water heaters and showers in all homes. The hot water just felt amazing. Then, looking down, she realized that this water too, was headed to the waste-water treatment plant, and wondered if the soap she was using had any particular effect on all those bacteria on the living in the sludge ponds at the other end?

'It's all connected' she thought as she dried off, brushed her teeth and got dressed.

She made coffee and leisurely ate a bowl of yogurt and granola topped with sliced pear and a drizzle of honey, feeling particularly grateful for both the Bee that had pollinated the flower on the pear tree and ones that collected this pollen and transform it into this sweet golden liquid that she, like Pooh, had a deep affinity for. When she was done, she returned to the pear core on the cutting board, chopping it up into the smallest pieces she could comfortably manage, grabbed the coffee filter and grounds, and after adding them to her countertop collection bucket, went to feed the worms. It felt good.

On the little balcony, she thought about how—when it came to organic materials—the act of ‘taking out’ or ‘throwing away’ could also be understood as ‘feeding’ the decomposers. The former emphasized the *removal from* a human environment, while the latter emphasized the *addition of* food (life sustaining material) to a living population. Moving something away from, and often out of sight of, your body has a very different connotation than using your body to feed others. Feeding connects us; ‘taking out ’or ‘throwing away’ implicitly connects us. This subtle linguistic maneuver had the power reshape the story around a considerable portion of the human waste stream.

Feeding the worms felt a little bit like playing the archetypal God: making it rain food from the sky. How many worms could be fed with five loaves of bread and two fish? Having worm bin was like having a few hundred pets, or perhaps, even a little pet ecosystem. Something like a like a living altar to the soil. Hero drifted off, thinking about how she could probably build a worm bin in a repurposed aquarium so that the edges of the process could be witnessed. It would be cool to have a worm bin with clear walls so you could really watch the feeding happen. Like the ant farms she remembered from childhood.

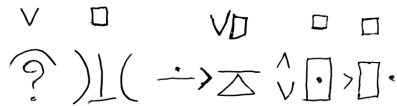
Hero woke up from the thought with a start when Grace walked through the room, excitedly calling out,

“The salmon are spawning! You should come to the river with me later after I get off work? — around 2!”

“Yea, very possibly. I’ll be downtown with Esri, call me when you get off.”

“Laaateerrr” Grace shouted as she rushed out the door.

An hour later Hero also headed out the door, having decided to walk the couple miles to The Casual Consumer where she was meeting Esri at 11:30 for lunch.



The walk was pleasant, and the air, crisp. Early fall flowers bloomed all around, and the oak leaves swirled down in the wind covering the ground with yellows, reds, browns and greens. A natural carpet that, if not swept away by some well-meaning person doing yardwork, would decompose over the winter and be unrecognizable by the time new leaves start budding out the following spring. But at the very least she hoped that if these leaves were swept away, they would be put in the right bin, and end up decomposing just outside of town at DCOM

She stopped for a minute at her favorite lookout just before crossing the bridge into downtown. It was underneath the roundabout at the bottom of the 4th Street hill: A little grassy park with a view overlooking the bay. Benches were positioned to optimize the view, but Hero always wandered just past the benches, to her favorite spot, and plopped onto the grass with her back against the trunk of a giant tree on the edge of the overlook.

Looking out at Capitol Lake to her right—the damned estuary now cordoned off due to the invasive New Zealand Mud Snail.¹⁰⁰ She saw the Port on her left, complete with giant cranes busily filling a cargo ship with dead trees, destined to float across the ocean to some far-off land. She looked out at the buildings comprising the downtown and couldn't help but remember the interactive map on the city's website that showed the consequences of sea level rise on the

¹⁰⁰ Kelly Stockton-Fiti (2018) "Recommendations for Capitol Lake New Zealand Mudsnaill Management" *KASF Consulting*. Report.

northern half of downtown¹⁰¹. Basically, everything north of 4th Street had been built on land created using fill from dredging the shipping channel for the port. This created problems now because the buildings sat at just over sea level and the land was pretty flat. As the sea level rises, a pretty significant area would flood on a regular basis. It was already happening once or twice year during king tides, but the projections suggested we could be looking at 50+ days a year in the next fifty years.

In some sense, the good news was that the area was home to so much crucial infrastructure—the port, the waste-water treatment plant, an electrical distribution center, the public transit hub, the children’s museum, and not to mention around thousand residents and hundred or so other small businesses—that the city had begun responding. She thought there was a good chance the city might succeed in fighting off sea level rise, but she was concerned for all the other coastal communities that lacked the agency, foresight and/or money to secure themselves against rising tides.

A duck swam into view underneath her from around the canopy of a tree. She watched for a while as another one appeared. They quacked and chased each other around in the water a bit—in what seemed to Hero stereotypical courting behavior. It was a nice juxtaposition.

Just watching.

After a minute a Blue Jay flew into sight, much closer than the ducks, and her attention shifted as it fluttered around in the trees. Eventually Hero’s attention shifted again to a group of seagulls swooping down at low tide and grabbing shellfish, carrying them up high in the sky,

¹⁰¹ Esri Story map produced by the City of Olympia modeling the impact of Sea level rise on downtown Olympia. Map can be found at: <https://arcg.is/LSyOO>

dropping them on the pavement, and then swooping back down to eat the tasty bits inside the now cracked-open shells. She'd puzzled over broken bits of shell strewn all over the ground a couple times, never quite understanding how they got there until one day last year when she'd heard the loud crack of an oyster hitting the pavement and watched a bird immediately swoop down and start eating.

Hero was watching the birds when she first became aware of the voices. It sounded like two men had stopped and sat on the bench behind her. Hero was sitting just out of sight, but well within earshot. This happened occasionally at *this* spot. Sometimes it was quite awkward. She tried to tune out the voices, but they were hard to ignore... and the first words she heard of this particular conversation only made it harder to ignore,

“But Michael, *We've Had 100 Years of Psychoanalysis and The World is Getting Worse*.¹⁰² Maybe it's time to look at that.”

There was a tone of exasperation in the man's voice as he went on:

“We still locate the psyche inside the skin. You go inside to locate the psyche, you examine your feelings and your dreams, they belong to you. Or it's interrelations...between your psyche and mine. That's been extended a little bit into family systems and office groups— but the psyche, the soul, is still within and between people. We are working on our relationships constantly, and our feelings and reflections, but look what's left out of that...”

Hero couldn't see but could imagine the man gesturing out to the world around them, before going on.

“What's left out is our deteriorating world. So why hasn't therapy noticed that? Because psychotherapy is only working on that "inside" soul. By removing the soul from the world and not recognizing that this soul is also *in* the world, psychotherapy can't

¹⁰² James Hillman and Michael Ventura (1992) *We've Had a hundred Years of Psychotherapy and the World's Getting Worse*. Book.

This conversation was synthesized from these two sources, with the bulk coming from the opening chapter of “We've Had 100yrs of Psychotherapy and the World's Getting Worse” which is a transcript of a conversation between James Hillman and Michael Ventura that occurred as they sat on a bench, upon the bluffs overlooking the Santa Monica pier, sometime in the early 1990's while I was enjoying life as a toddler some 7 miles south.

do its job anymore. The buildings are sick, the institutions are sick, the banking system is sick, the schools, the streets—the sickness is out *there!*”

The other voice muttered,

“That sea out there is diseased. We can't eat the fish.”

“There is a decline in political sense. No sensitivity to the real issues. Why are the intelligent people so passive now? Why? Because the sensitive, intelligent people are in therapy! They've been in therapy in the United States for 30, 40 years, and during that time there's been a tremendous political decline in this country.”

“How do you think that works?”

“Every time we try to deal with our outrage over the freeway, our misery over the office, and the lighting and the crappy furniture, the crime on the streets, whatever—every-time we try to deal with that by going to therapy with our rage and fear, we are depriving in the political world of something. And therapy, in its own crazy way, by emphasizing the inner soul and ignoring the outer, supports the decline of the actual world.”

“I'm not sure it's causal, but it's definitely a pattern. Our inner knowledge has gotten more subtle while our ability to deal with the world around us has, well, deteriorated— is almost not a strong enough word. Disintegrated is more like it.”

“Yes, and there's another thing that therapy does that I think is vicious. It internalizes emotions.” After a pause and he went on with a subtle inflection change, “I'm outraged after having driven to my analyst on the freeway. The fucking trucks almost ran me off the road. I'm terrified! I'm in my little car and I get to my therapist's office and I'm shaking. My therapist says, '*we've got to talk about this*'. And so, we do, and discover that my father was a son of a bitch brute and this whole truck thing reminds me of him. Or we discover that I've always felt frail and vulnerable, there have always been bigger guys with big dicks, so this car that I'm in is a typical example of my thin skin and my frailty and vulnerability. Or we talk about my power drive that I really wish to be a truck driver. We convert my fear into anxiety—an internal state. We convert the present into the past, into a discussion of my father and my childhood. And we convert my outrage—at the collusion or the chaos so whatever my outrage is about— into rage and hostility. Again, an internal condition that started as *outrage*; an emotion. Emotions tell us something about the world. We are learning to make sense of our emotions as if they only cover an

internal territory— without understanding that they connect our interior with exterior worlds.”

She could hear the speaker took a deep breath, and his companion took advantage interjecting:

“A therapist once told me that my grief after seeing a homeless man my age was really a feeling of sorrow for myself.”

“And so, you directed that emotion you felt inward. You decided that the important part of that experience was what was going on inside you.”

“Yes, it's also, in part, a way to cut off what the therapist would call Eros, the part of my heart that seeks to touch others. Theoretically, Eros is something therapy tries to liberate, but here's a person on the street that I'm feeling for and I'm supposed to deal with that feeling as though it has nothing to do with another person.”

“The principal content of American psychology is developmental psychology: what happens to you earlier is the cause of what happens to you later.¹⁰³ That's the basic theory: our history is causality. We don't even separate history as a story from history as a cause. So, you have to go back to childhood to get it why you are the way you are. So, when people are out of their minds or disturbed or fucked up or whatever, in our culture, in our psychotherapeutic world we go back to our mothers and fathers and our childhoods. No other culture would do that. If you're out of your mind in another culture or quite disturbed or impotent or anorexic, you look at what you've been eating, who's been casting spells on you, what taboo you've crossed, what you haven't done right, when you last missed reverence to the gods or didn't take part in the dance, broke some tribal custom. Whatever. It could be thousands of other things—the plants, the water, the curses, the demons, the gods, being out of touch with the great spirit. It would never, *never* be what happened to you with your mother and father 40 years ago. Only our culture uses that model.”

“Well, why wouldn't that be true? Because people will say... OK, I'll say, that *is* why I am as I am.”

“Because that's the myth you believe.”

“What other myth can there be? That's not a myth, that's what happened”

“Ahh ‘that's not a myth, that's what happened’. The moment we say something is “what happened” we are announcing to the world,

¹⁰³ I would distinguish here between developmental psychology (DP) as framework for understanding/supporting human development applied in the present tense (especially in childhood). I consider this Piaget branch of DP as distinct, and considerably more useful, than the more Freudian branch of DP Hillman and Ventura are riffing on here.

“this is the myth I no longer see as myth.” Or “this is the myth that I can't see through.” That's not a myth, that's what happened’ suggests that myths are things we don't believe. The myths we believe and are in the middle of, we call them ‘fact’ or ‘reality’ or ‘*science*’.” The speaker let that last word hang in the air.

“I can hear a voice and me saying, ‘but this thing happened, it's not mythological, god damnit!’ Yet at the same time, any journalist or cop can tell you, if you talk to several different people about an event they all witnessed or participated in, you'll have several different recollections of that event. I know in my own family, if you ask me and my sister to describe our mother, you'll get two totally different mothers, and neither one of us is lying. Memory is a form of fiction, and we can't help that. So, we are very much the creation of the stories we tell ourselves. And we don't know we're telling stories.”¹⁰⁴

“[Exactly. You cannot live without story. But you also have some interpretive power when it comes to understanding or framing stories. For better or worse, the stories we tell ourselves impact our lived experience. And stories are particularly important in response to our own emotions; they give us direction. If we are disturbed by homelessness, and our response is to retreat into our own psyches to discover what exactly it is about bearing witness to people sleeping in the street that is so triggering, we have consciously or unconsciously, made the decision that the problem that needs to be solved, the work that needs to be done, exists within our own psyche. At the very least we must be aware of that decision to move inward, and understand that in doing so, too often, we're retreating from the outside world.”

“You can spend your time and energy and money trying to figure out why homelessness is upsetting, and develop strategies to deal with this upsetting feeling, or you could direct your time, energy and money toward understanding why homelessness is occurring, and what you can do about it!.]”

“[Yes] I'm saying that the concentration on ourselves is part of our neglect of the world. Part of the reason the forests being cut down and the fish are going belly up. It's more important to think about those rivers and those fish, than to always worry about you and relationship to your son and your daughter or your mother or your father's father. Maybe. In other words, the concentration on personal relationships has narrowed the focus of the citizen to being a patient, a victim, a survivor; instead of being a citizen.”

“You really think we can solve society's problems?”

¹⁰⁴ Break in direct quotations, followed by excerpts of an interview on public radio Hillman did promoting *We've Had a hundred Years of Psychotherapy and the World's Getting Worse*.

“It doesn’t matter if we solve the problems.” He interjected rather fiercely. “We need to try. You fight not because you’re going to win; you fight because there is something to live for that is important. The fight is what gives your life meaning.” Chuckling a little bit, the man added, “or, you go to therapy and talk about it.”

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They were silent for a minute or two, before the second man stood up and said,

“Well, right now, I have to pee, and I’m going to do something about it.”

Chuckling the other man said, “I’ll walk over there with you. I could lose some water weight myself.”

And just like that they were gone.

Hero was alone again, thinking about what she’d just overheard, and frankly she wasn’t sure what to make of it. Could this be why our society was so screwed up: because the people with money and power had their feelings about the state of the world redirected into narratives of their own historical trauma and personal growth? And, in doing so, they were unwittingly redirecting that energy away from civic engagement?

She thought to herself, ‘Maybe we just need to find the right balance between *inward* and *outward*.’ She couldn’t help but feel that, among her generation, so much emphasis was placed on fixing things at the systemic level that the notion of working on oneself had become lost—not in the inner workings of the psyche, but rather lost in the superstructures of society. Maybe this was just the generational pendulum swinging back and forth. One generation locates all their problems and solution within the psyche, while the next generation locates all their

¹⁰⁵ James Hillman (1993) - *A Deeper Look* (hosted by Martin Wasserman). Radio program syndicated by KCSM-FM, San Mateo, CA.

problems and solutions on the societal level. Each generation reacting to the last... she wondered if it would ever balance out?

She'd grown wearing of her generation more recently, reading too many critical deconstructions, always seemed to leave Hero feeling powerless, ineffective and cynical. But more often than not it didn't lead anywhere... Like, okay, you've torn apart my conception of wilderness¹⁰⁶, now what? Once you've deconstructed my foundation, I'm left just sitting here amongst the rubble trying to figure out how to fit the pieces back together again... but nothing fits together anymore. It's all jagged edges and awkward corners.

And suddenly it hit Hero that there was all the difference in the world between deconstruction and decomposition. The decomposers break things down into basic elements in such a manner that cultivates fertile ground for rebuilding. The deconstructionists just smash things as fast as possible, leaving heaping piles scrap in their wake. The academic might have the power deconstruct a particular piece of literature— analyzing all the themes, characters, and plot points— assigning motives and offering commentary. But perhaps, Hero thought, it is the author—who first consumes such a story, decomposes it down to its basic elements, and picking out the most useful parts proceeds to produce something new—who genuinely welds powers.

She smiled to herself as she realized that perhaps that the trophic levels a nutrient cycle through could be analogous to the path of a meme traveling through the body of an artist.

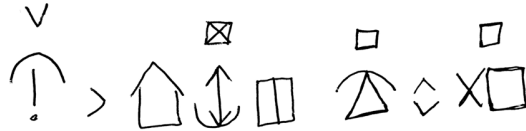
Feeling good about her new insight, and reflecting back on the men's conversation, Hero remembered and thought 'damn, developmental psychology too!' She'd never heard someone talk about it like that... It was so foundational to her understanding of what humans *are* that she

¹⁰⁶ Cronon, W (1996). "The Trouble with Wilderness: Or, Getting Back to the Wrong Nature." *Environmental History*. Book Section.

couldn't dismiss it, and yet it did seem the two old men on the bench were onto something because *It was* the myth that she didn't think was a myth.

Hero spent some time searching, trying to find other stories that she didn't expect as myths because she knew them to be true... and found herself swirling around this question about the difference between humans and nature. She'd never found a particularly satisfying articulation of that difference, but the possibility had never occurred to her that maybe there wasn't meaningful a difference. Was this another myth of her people; that humans are separated somehow from the rest of life on earth?

Checking her watch, she realized it was time to get going, so she crept out from behind the tree, feeling a little relieved now that the men had moved on. It would have felt a little awkward to reveal herself after eavesdropping.



Walking across the bridge into downtown, Hero thought about first meeting with Esri many years ago. They were in class together. It had been Hero's first class at this new school: *Operating Manual for Spaceship Earth* (OMSE). OMSE had been a year-long interdisciplinary program loosely based on Buckminster Fuller's 1969 book of the same name. The metaphor was elegant. We are astronauts on Spaceship Earth—but instead of understanding and maintaining the life support systems that keep our planet habitable, we're steadily dismantling or disregarding them in order to make our lives more comfortable.

Hero always thought about it like a car— being much more familiar with the inner workings of a car than those of a spaceship. In essence, people have taken the lug nuts off the

tires in order to attach a bigger navigation screen to the dashboard. We've been living with the pedal to the metal for so long that everything under 4th gear seems useless. And so, we've dismantled the transmission to be able to use the gears to make a more adjustable driver's seat.

It had been amazing year; the 50 or so students had worked on their own 'operating manuals' with wide ranging topics that covered the whole spectrum of sustainability studies. Hero's take away had been both inspiring and disheartening. Going in, she really thought humans just needed an operating manual. After that class she'd realized the problem was much more pernicious than that. We had the manuals; we just weren't using them!

Esri's presentation had been particularly inspiring. She had researched cases from all over the country where the library model had been expanded into realms far beyond books. She'd presented examples of how the model of collective ownership and equal access could be applied to many areas of our consumer economy. She showed examples of tool libraries and toy libraries that were already up and running. The images were striking. The toy library looked like a toy store except without the price tags. It was like a dream come true for a younger Hero!

Hero had been in awe a couple months before when on vacation she had seen a hand painted sign along the side of the road reading "Vashon Island Tool Library"¹⁰⁷ with a big arrow pointing down a side street. Hero insisted they go check it out—and it was well worth it. After a couple turns, they found themselves walking into a warehouse in the back of a nondescript industrial complex. Rows of large shelves overflowed with tools organized into different sections; something like a cross between a Home Depot and a thrift store. The place seemed to have everything you could need, from lawn mowers to table saws, paint guns to drain snakes. It

¹⁰⁷ This is based on my experience visiting the Vashon Island tool library while on vacation there in 2019. Explore more here: <https://vashontools.org/>

was like a dream come true! It was the kind of place that made Hero want to move into the neighborhood.

She had have fallen in love with an old set of wood carving tools that looked like they were older than her with worn wooden handles and a deep patina on the blade that faded smoothly into the polished steel of the working edge. She'd imagined the hands that must have held them before...

One of the most surprising and endearing aspects of the whole thing had come as Hero spoke with the tool librarian about where the tools came from. The librarian shared that although they received some small donations, the bulk of their resources came from entire workshops whose contents were donated by heirs, or increasingly, were donated by people who have reached an age stage in life where not using them. For those people, the librarian shared, who had built tool collections over a lifetime, the tool library was a good option. It made a lot of sense to Hero too; someone who spends a lifetime building a collection of tools would want to donate them to the tool library; making their collection accessible to the whole community. In some sense, the tool library offered the serious collector of tools an opportunity let their collections live on after they die.

As she reached the bottom of the bridge, the thought occurred to Hero that the library model might just be the best resource use model for things that don't decompose. That structural model allows for the maximum possible use value distributed across a community. Basically, anything that you own that is reusable could be circulated through a community with the library model.

Esri's work had been inspiring, and yet again, emblematic of the whole situation; we had the library model, we just rarely applied it. The operating manual existed, for the most part we just didn't use it.

'Who actually reads the instruction booklet?' Hero mutter aloud in exasperation as she crossed into downtown.



When Hero got to The Casual Consumer, she found Esri sitting on the other side of the room, drawing in one of the sketch books shop kept stocked at each table like salt and pepper. Hero enjoyed paging through these sketchbooks; it felt a little bit like time traveling. She could get a sense for the people who had eaten here before, a little glimpse into the shared history of her table. Esri was so engrossed in what she was doing that she didn't look up until Hero said, "Hey stranger" as she pulled out the chair and sat down across the table.

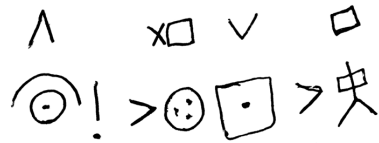
"Hey! Good to see you Hero, I got us a pot of green tea, help yourself."

Hero obliged and was pouring herself a cup as Esri continued,

"Oh my god, I finished S-Town this morning. That's one of the craziest, most bizarrely disturbing podcasts I've ever listened to!"

"Yeah," Hero agreed in an exaggerated manner and went on to discuss the details of the story, which eventually turned to gossiping about mutual acquaintances – as so often is the case with old friends. Where was Jean-Luc? What ever happen to Trinity?

Hero described the dissolving of her last relationship, her graduation from college, and all the anxiety and excitement that brought... eventually recounting (as best she could) the conversation she had just overheard between the men on the bench.



“That last bit about going inward is interesting,” Esri replied. “I can’t help but think of it through my own filter, and, well, I have spent much of the last couple of months going inward through a completely different frame of reference. I mean, they might be right when it comes to the psyche, but when it comes to your body, a lot of what’s on the inside isn’t necessarily you.”

“What do you mean?” asked Hero.

“I mean your microbiome. ‘The human body contains trillions of microorganisms — outnumbering human cells by 10 to 1. Because of their small size, however, microorganisms make up only about 1 to 3 percent of the body’s mass.’¹⁰⁸ But still, I mean that’s 90% of the cells that make up your body are actually non-human. It sounds crazy; I know. But I got sick after I came back from Ecuador last year—I got some kind of stomach bug, we never figured out exactly what it was—but my doctor had me get my microbiome tested, and long story short, in trying to figure out what was going on in my own gut, I stumbled into this crazy

¹⁰⁸ National Institutes for Health (2012) “NIH Human Microbiome Project defines normal bacterial makeup of the body: Genome sequencing creates first reference data for microbes living with healthy adults.” Press Release.

field of research around the human microbiome. Researching this stuff has really forced me to rethink what a human being is. *What I am.*”

“Ohh, tell me more. How do you think of a human now?”

“It's crazy.” She prefaced again, “Well, I suppose I used to think that there was all the difference in the world between humans and nature. I mean, I live here within my skin and nature lives there outside of my skin. But when you start looking at the world through the perspective of the microbiome that boundary gets very, very blurry. Like you and I are not just walking, talking manifestations of genetic code. We are also walking and talking microbial ecosystems! We have diverse organisms living in niche habitats throughout our bodies. These microorganisms literally share our body space; your mouth alone probably harboring over 700 species of bacteria.¹⁰⁹ You have a hand microbiome,¹¹⁰ and there's microbiome that changes throughout your respiratory tract.¹¹¹ In your bladder too,¹¹² and of course you have an epic microbiome in your gut that can have impacts on health in what are often rather staggering ways.¹¹³”

“For example?”

“Well, there's so many examples. I mean, there's a lot coming out about the ‘mind-gut connection.’¹¹⁴ Research is basically showing that your gut microbiome can have direct impact on your mood regulation and other issues like depression

¹⁰⁹ Nimish Deo and Deshmukh (2019) “Oral microbiome: Unveiling the fundamentals” *Journal of Oral and Maxillofacial Pathology*. Journal article.

¹¹⁰ Edmonds-Wilson, et al. (2015) “Review of human hand microbiome research” *Journal of Dermatological Science*. Journal article.

¹¹¹ Santacroce et al. (2020) “The Human Respiratory System and its Microbiome at a Glimpse.” *Biology*. Journal article.

¹¹² Thomas-White, Brady, Wolfe & Mueller (2016) “The Bladder Is Not Sterile: History and Current Discoveries on the Urinary Microbiome” *Current Bladder Dysfunction Reports*. Journal article.

¹¹³ Patrice D Cani (2018) “Human Gut Microbiome: Hopes, Threats and Promises” *Gut*. Journal article.

¹¹⁴ Emeran Mayer (2016) *The Mind-Gut Connection: How the Hidden Conversation Within Our Bodies Impacts Our Mood, Our Choices, and Our Overall Health*. Harper Collins. New York, NY.

and anxiety¹¹⁵. It's crazy... and not always so subtle, researchers are drawing significant connections to serious mental illnesses, like schizophrenia and bipolar disorders¹¹⁶. There's even an emerging subfield called of "Psychobiotics" that's exploring the possibility of introducing specific bacteria into the gut microbiome as a means treating a whole host of cognitive issues.¹¹⁷

"Whoa!" Said Hero, feeling a bit overwhelmed with information... which of course didn't stop Esri from continuing.

"On some level it's strange to think about your gut having such a direct influence on your thinking," Esri paused for a second as if for dramatic effect, then added, "but then when you really start thinking about it, you realize that there are so many different things we can eat or drink that affect our thinking: eat the right mushrooms or drink too much alcohol and it's very hard to deny that what goes into your mouth can ultimately affect your brain."

Laughing a little bit Hero replied, "Yea, I never really thought about it like that."

"I take it you're familiar with the sense of having 'a gut feeling 'about something?"

"Of course!"

"In recent years, scientists have begun to map the underlying biological structures that might inform such a feeling! We have what's been described as a 'second

¹¹⁵ Peirce and Alviña (2019). "The role of inflammation and the gut microbiome in depression and anxiety" *Journal of Neuroscience Research*. Journal article.

¹¹⁶ Nguyen et al. (2019) "Gut microbiome in serious mental illnesses: A systematic review and critical evaluation" *Schizophrenia Research*. Available online, as corrected proof.

¹¹⁷ Bermúdez-Humarán et al. (2019) "From Probiotics to Psychobiotics: Live Beneficial Bacteria Which Act on the Brain-Gut Axis" *Nutrients*. Journal article.

brain' or 'little brain' or 'Gut-Brain-axis' distributed throughout our digestive system. And well, in the way that our big brain is constantly mediating our interactions with the outside world through an active sense-response feedback loop, our second brain that surrounds our gut mediates our relationship with the world in a similar way... but it's the parts of the outside world we choose to put inside us." Esri said, before going on,

"And it's not just mental— on the trajectory from one end of our body to the other, that food passes through a series of diverse microbial communities that are effectively eating the food too. The microbes in your gut eat by releasing enzymes that break down organic molecules into bioavailable forms that then become accessible to both the micro-organism releasing the enzyme, but also the super-organism (us!) that has effectively contained the whole process. Every time we eat, we are feeding ourselves, but we are also feeding the billions and billions of organisms that share our bodies."

"It's like compost!" Hero exclaimed, with a flash on insight finally knowing where to jump in "This is kind of crazy. For the last couple of days, I have been on this kick thinking about composting as a way of reconnecting with the natural world. I have been thinking about food waste and yard waste, and frankly even human waste. You know, thinking about composting as a way of reconnecting with the natural world, of making peace with decomposers." After pausing for a second she continued, "I have been tripping out on all the different places where it's possible feed the decomposers, and I guess, what I'm hearing now is that perhaps it's actually impossible to separate feeding us from feeding our

decomposers. We all go through life with a special kind of compost pile in the center of our bodies!”

“Composting is powerful,” agreed Esri, “And yeah, being human--scratch that--being a mammal, in some sense means that, by definition, you are powered by an anaerobic digester filled with microbes located in the center of your body.”

“I was touring the county’s composting facility yesterday, and the raw energy that was just radiating off of the piles really impressed me. I was walking back to my car and I had this vision that fossil fuels were what happened when that energy couldn't escape through decomposition and instead those materials were subject to immense pressure and heat for millions of years. And now, I guess I'm seeing that it's that same kind of energy radiating off of a steaming pile of compost that fuels my body...” Hero’s voice trailed off, and then finally she added, “Maybe we made peace with these decomposers a long time ago, and then we forgot all about it.” Those words hung in the air for a while before either of them spoke again.

Eventually Esri went on “Some of the interesting research that I found was an ongoing debate around the what called the “Bacterial Baptism Hypothesis” that relates to the passing of the microbiome from mother to child during birth.¹¹⁸ It’s a bit unclear what the long-term health impacts of children born via cesarean section versus those experiencing vaginal births are, but there is evidence that the infants gut microbiome is effected by its method of birth.¹¹⁹ The they found that

¹¹⁸ Stinson, Payne and Keelan (2018) “A Critical Review of the Bacterial Baptism Hypothesis and the Impact of Cesarean Delivery on the Infant Microbiome” *Frontiers in Medicine*. Journal article.

¹¹⁹ Hoang, Levy and Vandenplas (2021). “The impact of Caesarean Section on the Infant Gut Microbiome.” *Acta Paediatrica*. Journal article.

although the womb near sterile, the birth canal is very much not, so that when the child is born vaginally, they are immediately covered in their mother's microbiome. Children born through cesarean section skip the trip through the birth canal and often then are colonized by the microbes in the hospital room instead... there is a practice called "Vaginal Seeding" that is being used after C-sections in an attempt to counter act this phenomenon and reintroduce vaginal microbiome—basically as soon as they pull the baby out it gets vaginal fluids smeared all over it. It makes perfect sense to me, and I've been surprised by how controversial an issue it has become in the literature. Frankly I think it has a lot to do with the fact that more and more mothers are requesting it— because it make's intuitive sense— and well, doctors who 'know what's best' don't want to take orders from their patients... focusing their concerns on the risk of transferring infection to the newborn and the lack of evidence that the practice is effective. But it's such a new concept, that it hasn't been adequately studied. And there are a few confounding variables.

Nursing seems to also play a big role in the development of the infants microbiome too, turns out breastmilk also has a microbiome that's transferred the from mother to child during breastfeeding— not to mention the skin microbes transferred from the areola.¹²⁰ The observation that breast milk is a means of passing microbiome from mother to child makes a pretty strong case that we figured out how to make peace with our gut microbiomes a very long time ago."

¹²⁰ Pannaraj et al. (2017). "Association Between Breast Milk Bacterial Communities and Establishment and Development of the Infant Gut Microbiome" *The Journal of the American Medical Association: Pediatrics*. Journal article.

After pausing momentarily Esri continued, “Maybe we've gone beyond peace and into the world into the realm of symbiosis. There are many places where our relationship with our microbiome is characterized by much more than non-aggression — it’s more like mutual aid. Symbiosis. We both help each other. Just by living we support them, and just by living they support us.”

“The bit about breastmilk is fascinating.” Hero said, “now that you mention it, somebody was just telling me about a disease—I can’t remember the name right now— where in recent year they’ve discovered fecal transplants to be something like a miracle cure.”

“Yes! Crazy right! It sounds like some medieval medicine type shit!” Esri laughed with a look in her eyes that said *pun intended*. “I don’t know about a miracle cure, but seriously, who would have thought that one person’s poop could be another person’s medicine?”¹²¹

Moments later the waiter showed up with that impeccable sense of timing that left you wondering if they had overheard the conversation they were about to walk into. Esri ordered a kale salad with poached eggs and Hero opted for a classic: two eggs, potatoes and toast.

After the waiter left the two kept talking, touching on pesticides and preservatives, and wondering if our attempts to stop the pests from eating our food in the fields, by poisoning them, might also be poisoning the microbes within us.

Esri commented, “It’s so funny you know... that we have an ‘organic’ produce section in grocery stores. It's kind of absurd! The word ‘organic’ already meant

¹²¹ Voth and Khanna (2020) “Fecal microbiota transplantation for treatment of patients with recurrent *Clostridioides difficile* infection.” *Expert Review of Anti-infective Therapy*. Journal article.

something that applied to all food, so deciding that just *this* food can be labelled organic is a non-sensical claim. It's Orwellian. We take a word that has a broad meaning, then redefine it to mean something specific—a nuanced sliver of that original broad category. It creates an inherent tension in the word because if you use that specific interpretation— in this case food grown without synthetic products— you are, by definition, excluding a large number of the cases that would easily have fallen within the old category. The broad definition of organic is import and it gets confused when we use it to mean ‘made without synthetic poison’ colloquially.”

“And you would think that a message that appears to be as important as ‘made without synthetic poison’ being shortened into a word so seemingly innocuous as ‘organic’ would have set off some alarm bells in someone’s head.”

“I’m sure it did. I mean, unfortunately we don’t seem to have the linguistic equivalent of a fire alarm to pull in the case of our words definitively combusting,” Esri said, adding, “And look at what ‘meme’ has come to mean... It’s but a fraction of what Dawkins defined.¹²²”

“Yep—same thing,” Hero replied.

"And why did we come to name this particular kind of cultural transmission with the same word that refers to ‘all units of cultural transmission’—it just seems so self-defeating to me. The concept of ‘memes’ is really important. It’s the damn

¹²² Richard Dawkins (1989) "11. Memes: the new replicators", *The Selfish Gene* (2nd ed.). Book section. p.368.

bridge between the social constructionists and the evolutionary theorists! And we need that bridge more than ever.”

“If only we could figure out how to market ‘Organic Memes’ to the world, maybe we could save it,” Hero said jokingly.

Esri buried her head in her hands, shaking it with exasperation, “Ideas without synthetic pesticides or fertilizer?”

“Something like that. Pure ideas—nothing toxic.”

“I’m not sure... there isn’t much that scares me more than a group of true believers armed with ‘pure’ ideas, convinced they’re going to save the world.”

“You’ve probably got a point... but somethings gotta give? It feels like we’re pushing up against hard limits, something’s going to start pushing back. The atmosphere doesn’t care about our language”

“I think linguistically speaking we already are hitting the limits... I swear, we’re living through the Tower of Babel; except it’s digital — like seriously — something is interrupting our ability to communicate with each other at the precise moment when we have built the best communication tools the human species has ever known. We built this thing,” Esri said, holding up her phone, “and we all started using it, and now it’s harder to understand each other than ever... but it’s so addictive and contagious that we can’t put it down... And it’s increasingly the place we turn to seek definition and meaning in our lives. It’s strange... and I don’t think it’s going to end well.”

Smiling as she saw the opportunity for a good quote, Hero jumped in, “Wait a minute, Juanita, this thing your describing, is it a virus, a drug, or a religion?”¹²³

Esri shrugged, playing her role perfectly. “What’s the difference?”

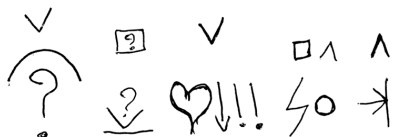
Their shared love of Neal Stephenson had been one of the first things they really bonded over, when they had both been reading *Seveneves* on that first field trip together.¹²⁴ Of course the scene they had just enacted was from *Snow Crash*; but Hero knew that Esri, like her, had read them all.

“Kale Salad with poached eggs?” interrupted the food runner who’d just appeared with plates in hand. Esri raised her hand a bit and nodded, and he put the plate down in front of her.

“Eggs potatoes and toast?” asked the runner as he slid the other plate down in front of Hero who asked for ketchup and Tabasco. Moments later he had come and gone with condiments, and the two of them were busy eating while occasionally throwing out memes that have made the world better.

Eventually Hero’s phone buzzed in her pocket and pulling it out she saw a message from Grace, “Hey, I’m off, Going to the river. Should I swoop you?”

Esri was into it too, so an hour later, after stopping back by Hero’s to drop off Esri’s car, the three of them were driving to one of the many rivers that drain into the Puget Sound.



¹²³ Neal Stephenson (1992) *Snow Crash*. Book. p.406

¹²⁴ Neal Stephenson (2015) *Seveneves*. Book.

On the drive up they listened to a fascinating RadioLab about Facebook censorship.¹²⁵ The show exposed a particular dynamic none of them had ever thought of before: the psychological experience of the censors spending their workday (every workday) looking at flagged images and trying to determine if they violate Facebook’s community guidelines. It’s a twisted dynamic, because the very act of flagging a post conveys the judgment ‘not appropriate for viewing in my community’ but in flagging a post you’re just sending it to another feed— of only flagged posts—that someone else, in a different community must look at. Someone sitting in-front of a screen, in a non-descript building in a far-off land processing 1000s of flagged posts a day. The sensors sending the censors material for censure. There’s quite the debate about censorship in the social media space, but it all seems to focus on the users who either want more, or the users who insist there’s already too much. It’s mostly free speech debate... between the sensitive and censored, with little regard to what’s happening *Behind the Screen*, to the actual censors, in the shadows of social media.¹²⁶ Who scrubs all this toxic shit we dump into the waste stream? Who are *The Cleaners*?¹²⁷

The three agreed that they might be able to do this job for a day, maybe a week, but it would drive them crazy eventually.

Grace pointed out the parallel to some of the worst recycling systems, “Oh my, it’s just like the e-waste streams flowing from the richest places and converging into rivers that eventually flood some of the poorest populations with the ‘job opportunity’ of sorting through all our toxic crap...”

¹²⁵ Adler and Hunte (2018) “Post No Evil” *Radiolab*. Radio program.

¹²⁶ Sarah T. Roberts (2019). *Behind the Screen: Content Moderation in the Shadow of Social Media*. E-book.

¹²⁷ Block and Riesebeck (2018) *The Cleaners*. Independent Lens. Documentary film.

“Yea, that primary literature is pretty depressing,¹²⁸” Esri added. “They make us feel better about ourselves by creating a ‘proper’ place for disposal— just bring it to the right place and it will go ‘away’. But too often ‘away’ means transporting the material to places with few economic opportunities so people will accept the negative health outcomes associated with processing the material just to gain access to an income stream.”

“And we keep doing it...” added Hero, saying “I was just reading a report a few months ago where a non-profit hid like 200 GPS trackers in old electronics and then disposed of them properly in 2016, and watched as like 30% of them still ended up going overseas, the report had a map and everything¹²⁹... and then, the same group did it again in 2020 and found 4 out of 6 LCD monitors they donated to the Goodwill in the U.S. eventually ended in Guatemala City illegally.”¹³⁰

“It really is bizarre to think of social media as generating waste products.” Grace replied, “Like with e-waste you have something physical, but this digital stuff just seems so... well, *not* physical!”

“I really want to see a picture of one of these censorship factories.” Hero said, “I keep imagining them like the psychological equivalent of the e-waste slums.”

And then another question struck Hero and she asked, “Where might decomposition fit into this social media system?”

The trio didn’t make much progress on the flagged images, because it seemed dangerous to give AI editorial power over speech. Child porn and extreme violence maybe, but speech

¹²⁸ Brett H. Robinson, “E-waste: An assessment of global production and environmental impacts” *Science of The Total Environment*. Journal article.

¹²⁹ Basel Action Network (2016) “Disconnect: Goodwill and Dell Exporting the Public’s E-waste to Developing Countries.” Public Report.

¹³⁰ Basel Action Network (2020) “GPS Trackers Reveal Dell Reconnect via Goodwill Exporting E-Waste to Guatemala.” Public Report.

seemed dangerous... and well very challenging because laws around speech were different depending on what country you were in.

The conversation turned to another social media problem. People on social media were getting dogpiled on for something someone dug up deep in their social media history. In just an instant, your worst moment could go viral and a life could be canceled.

“It’s sort of bizarre,” Hero said, “that default social media settings are *preserve everything*. It’s the opposite of the natural world—where decomposition is sort of the default and preservation generally requires, specific and conscious effort.”

Grace asked, “What if everything you posted on social media began to decompose after a year or two unless you were intentional about going back and hitting something like a ‘Pasteurize post’ button?”

Esri added, “It’s not just big brother watching you—everyone can watch you! And somehow, we’ve gotten caught up in a competition, where the more people ‘like’ watching you, the higher your status. I’m not sure that’s healthy. I don’t want 100,000 people evaluating my outfit, I do my best to not give a shit what the 100 people I might see in a day think of what I’m wearing.”

Hero jumped in, “We’re increasingly moving through the world with an eye focused on curating those bits of our life that we wish to broadcast out on our social media feeds.” She added, “But what exactly is it that we are feeding?”

“We’re feeding our social networks,” Grace responded, “or maybe they are feeding us?”

“Yeah” said Esri. “I think the most generous interpretation is that we’re feeding our friends and family, we’re maintaining our social networks across large distances. But I can see what you’re getting at... We’re also feeding governments, and corporations, and frankly, maybe, the scariest is that we’re feeding the algorithms. The machine learning revolution in seems to be bringing us closer and closer to a world where artificial intelligence wins. It’s almost as if our social media feeds are entering into a digital ecosystem where they are consumed multiple times—something like trophic levels of big data.”

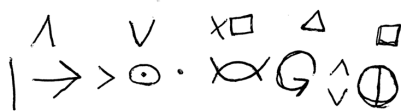
“And we’re the autotrophs,” added Hero.

Esri quipped back with, “We photo-synthesize the world around us!”

“It’s eerily like *The Matrix*,” said Hero.

“Except voluntary,” replied Esri.

“For now,” finished Grace, with a rather resigned inflection in her voice.



As they parked and got out of the car, Hero couldn't help but notice the strange new cultural landscape they had just entered. The parking lot was rather full, and just down the road from them was a group of about 25 people who arrived just before them and appeared to be on a field trip—they were mingling outside three white passenger vans with notebooks and cameras in hand. Hero noticed a tree inside a chain link cage in the middle of a mowed lawn. Across the park she could see people gathered by the river's edge. Even from the parking lot there was an

atmosphere of spectacle. It was a different energy than would have been present on a normal summer day— when people were burning in the sun, hiding in the shade, and floating in the river.

Today there was something happening...

“You know there’s something special going on when people flock to a place that smells this bad,” Grace noted as they walked across the park in the direction of both the crowd and the stench.

“Reminds me of the foliar days back at the farm when we use to spray down everything with liquified fish fertilizer.” Esri offered. “The stuff smells awful— but the plants sure did love it” She added, “You could see them perk up in the space of hours.”

“Yeah,” said Grace. “I read somewhere about how effectively a similar thing is happening here. These ecosystems where salmon spawn get a huge annual dose of organic fertilizer in the form of hundreds or thousands of decaying fish—”

“*The Salmon in the Trees*,¹³¹” Esri interjected. “They found deep sea minerals in the trees around these streams as I recall. The idea was that animals, birds in particular, feed on these decaying salmon which have spent a lifetime traveling the ocean— and then move into the surrounding environment and poop what remains it out.”

“Where it becomes food for the decomposers,” Hero added with a smile as they arrived at the river’s edge, they saw no shortage of birds swooping in and out

¹³¹ Peter Wohlleben (2019) *The Secret Wisdom of Nature: Trees, Animals, and the extraordinary Balance of All Living Things*. Greystone (English translation) Book Section. p.22-34

gorging themselves on the dead fish. “It’s funny to think about bird poop being so valuable.”

“Yea” Grace added, “bird poop—well, bat poop was one of this continent’s first major exports... it’s random to think about now, but it played a significant role in the early colonization of the Americas.”¹³²

After a couple of moments of reflection, and then awe at the scene in front of them, Hero went on, “It’s sort of magical... We’re watching as energy and nutrients are being transferred from the ocean to the forest.”

Silence returned until Grace eventually broke it: “To me it feels magical just to bear witness to a species that has such a different relationship to death than our own. When I try to imagine this from the salmon’s perspective it looks like a nightmare.” Gesturing out to the scene in front of them, “It looks like there are more dead salmon than living ones, and the living ones are persistently fighting upstream, dodging other bodies in absurdly shallow water. I mean, this is a mass grave. It would be a tragedy for so many species—a signal screaming at us that something was wrong! Most species do not die together of their own doing. If you came across 1000 dead birds, or 1000 dead mammals, you would be pretty freaked out, because it would suggest that there was something very dangerous around. But for the salmon, this is the fulfillment of their destiny. These are the salmon who have lived their entire lives successfully and have now returned to

¹³² Gregory T. Cushman (2013) *Guano and the Opening of the Pacific World: A Global Ecological History*. Book.

the place where they were born to reproduce and die. Just as their parents before them did. And hopefully as their children after them will do.”

“We, on the other hand, fight death with pretty much everything we've got,” Hero replied.

“Exactly,” added Grace. “While the salmon offer up their bodies as fertilizer for the environment that will raise their offspring, we actually embalm our bodies with preservatives that poison the environment and anything that might eat us.” She paused then added, “or we get buried in cement lined graves, or get cremated. We do our damndest to put up a barrier between ourselves and the rest of the natural world even after we die.”

“We fight the decomposers even in our own death,” Hero said solemnly.

Esri chimed in, “Did you know Washington State just legalized human composting?”

“Actually yeah,” Hero responded. “The tour guide at the composting facility the other day mentioned it briefly while she was showing us the composter they use for roadkill. But I forgot to look it up when I got home. I ended up going down the sewage treatment rabbit hole instead. What do you know about it?”

“It's pretty remarkable—someone in my conservation biology class did a project on it last year. As I recall there was one main company about to start doing it that was really cool.¹³³ One of the things I remember were the renderings of what the facilities would look like, and they were very beautiful. I remember the woman

¹³³ Recompose Inc is the first company in the united states to offer Human Composting as a mean of natural body disposal. Started by death care advocate, Katerina Spade, this is a fascinating company operating an innovative model. Learn more: www.Recompose.life

who started the company had a past career as an architect, and that really came across in the designs of the spaces. They're awe inspiring. The kind of place that was befitting a funeral. I mean, you could have a service, and then place the body in the composter, where would decompose for eight weeks, during which time there were hours where you could visit the tumbling remains and eventually you could have an opening ceremony during which the compost would be distributed to loved ones, or donated to local conservation lands.”

“That’s powerful,” said Hero.

“What do the composters look like?” asked Grace.

“A bit like an oversized side loading commercial washing machine or dryer. Except without the glass window—so you can't actually see the composting taking place,” Esri replied.

They watched the river and the salmon for a while in silence. Hero focused on one fish in particular who was trying to navigate a very shallow patch of rocky water that left a good third of its body exposed.

A few minutes passed in silence.

Esri eventually went on, “You know, one of the other things that always stuck with me from the presentation on human decomposition was a point the guy made about the clash between religious narratives and narratives of evolution. We had read this book for class called *Last Song of the Dodo*¹³⁴ which had a section that went over the origins of evolutionary theory and the way the tension with

¹³⁴ David Quammen (1996) *Song of The Dodo: Island Biogeography in An Age of Extinctions*. Book. p.15-115

creationism played out in society. And while there is no doubt that creationists still exist, evolution has effectively won *that* debate. The guy's point was that religious narratives answer three questions:

1. Where we came from?
2. How should we live while we're here? and,
3. Where do we go after we die?

While evolution through selection does present a direct challenge to the question of where we come from, it doesn't tell us much about the second or third question—at least in a personal sense. The answers to the question of what happens after death is better answered through the lens of nutrient cycling. He pointed out that we have cross-cultural canons about the afterlife of one's spirit or soul or consciousness that date back thousands of years, and yet while so many have speculated about what happens to these intangible parts of one's being after death, we don't have any clearer an answer. Scientists who really wanted to understand how ecosystems work have started mapping what can happen to all the tangible parts of you. They have developed a clearer and clearer picture of how nutrients and energy move through ecosystems after death. Still, they haven't really worked out that tension, they haven't incorporated those data sets into the way we think about death culturally. I'll never forget his last PowerPoint slide; it was a big image of tomatoes on the vine with blossom end rot and he said something like,

“Look... I have no idea what happens to your spirit or your soul after you die, but the near ubiquity of these stories about something happening that appear across human cultures suggests to me that they are important, we seem to need stories about the afterlife. But I would suggest that those stories need to account for the fact that this tomato plant is suffering from a calcium deficiency, and the fact is, that if it was growing in soil that was amended with your composted remains, this wouldn't be happening—because the tomato plant could be re-consuming the calcium that was once in your bones. I don't know how to interpret that? What meaning to make of it? But just as the history of life was held to account for evolution, perhaps, the future of death should account for nutrient cycling.”

“That's an interesting way to think about it: never occurred to me before,” Grace commented. “Whereas evolution gave us a new foundation upon which to build our updated creation narratives, nutrient cycling offers new evidenced upon which reviewing, we might choose to redraft our stories about death.”

Hero couldn't stop thinking about the salmon, the composting tour, the circle of life. Holding up her hand in front of her face— as if really seeing it as if for the first time— she said in a rather slow voice “I'm recyclable” and then, and a second or three, “Maybe this is something we can learn from the salmon. As we die, let us offer up our bodies as fertilizer for the habitats our offspring will occupy.”

“What does it mean to be eaten?” Grace asked in tone suggesting she wasn't quite comfortable with the idea.

“It seems like most of our stories about being eaten are terrifying!” replied Esri.

“I mean, it makes sense because the idea of being eaten alive is terrifying. But it does seem like maybe being eaten *after* you die holds the seed of an entirely different story.”

“It’s funny,” Hero said after some thought, “I think you could interpret some of the traditional stories as metaphors for decomposition.”

“How so?” asked Grace.

“As you decompose parts of your material body are released as gasses, which can float up into the sky. Other parts of your body break down into the smallest of pieces and stay below us in the soil... And frankly, now that I say that out loud, I think you could take it even further if I anthropomorphize the molecules that make up my body. When I think about life as an N₂ or a CO₂ molecule floating around in the atmosphere, I imagine it’s a rather blissful experience —something *like* heaven. Whereas those pieces of you destined for the soil will be eaten, eaten again and eaten again, by a series of nightmarish creatures that when viewed at scale, clearly belong in dystopian sci-fi — Something *like* hell.”

“That is certainly an interesting way to think about it,” Grace responded, eyebrows raised. “I’ll bet there are lots of examples of different ways that various after death cultural narratives could be read as metaphor for nutrient cycling and other natural process. I wonder if anybody has written that book?” adding “I’d read it.”

“Me too!” responded Esri and Hero simultaneously.

“Jinx!”

The three of them laughed.

Hero thought about something the gardener had said about how it's not just that we fail to understand decomposition when we're looking directly at it, but more like when we don't focus on it directly, we don't see it lurking in the periphery. If you look for decomposition, you can almost always find it. And if you can't, Hero realized, that might tell you something important about the system in question.

She wondered aloud, “What would decomposers look like in the context of capitalist economy? Where does money decompose?”

At first her friends gave Hero quizzical glances... But, eventually embraced the seemingly obscure question.

“You know it's funny,” Esri said. “In a class we once read about the major developments in the field of ecology —when scientists discovered that some of the analytical tools developed in economics could be used to better understand how ecosystems worked. Of course, there's a lot of work being done in the vein of ecosystem services: attempting to quantify the specific monetary values that individual ecosystems (or aspects of those ecosystems) offer to the broader community. It's righteous work. But I always kind of felt that it was half the picture. We're using tools of economic analysis to assess and value ecosystems, but, the other side of that, why don't we use ecosystem analysis to assess and value our economic systems?”

“Yea,” said Hero, “*Exactly!* What would it look like if our economy understood that decomposition was just as crucial a structural element as production and consumption?”

“Maybe, something like a universal basic income?” Grace asked.

“How so?”

“Well, the government collects taxes from both production and consumption of goods, and in my mind, a universal basic income might be the equivalent of breaking that money down into its most assessable units —cash— and redistributing it to the whole population.” She took a breath, then added “You know there's a guy running for president who wants to give everybody \$1000 a month.”

“That's an interesting thought,” said Esri. “Universal basic income as a sort of systemic analog to the function of the decomposers in an ecosystem... I can't help but think of generational wealth, and the absurd amount of money that gets passed down. Like when a big old tree dies... wait, scratch that—when anything but a mammal dies— it doesn't get to decide ahead of time where of its resources go after it's dead. Only we do that.” She added, pausing for a second, “I might return to that, but” glancing back at the salmon, “I keep coming back to this other thought about nutrient cycling, death, and religion. I mean, maybe the phenomenology of nutrient cycling as it relates to decomposing bodies transferring nutrients into the soil is related to the origins of bodily sacrifice as a religious practice... You know, for the longest time I could understand why on

earth we would think that killing animals, or even people, would somehow please the gods. But I just had another thought..."

"Say more," said Hero, interested but unsure because she also had always thought of bodily sacrifice as a bizarre practice.

"Well, for instance," Esri continued, "in organic agriculture, blood-meal is often used as a fast-acting high nitrogen fertilizer. Today we get it as by-product from slaughterhouses, it's just dehydrated animal blood. I know, it's gross, but the blood from the cows in your hamburger was very possibly dehydrated and sold to farm where it was used as a fertilizer... while we don't drink blood, plants kind of do."

Hero's mind could help but to conjure up an image of the vampire plant, with leafy green arms and blood dripping fangs— straight out of 'Little Shop of Horrors.' But Esri went on,

"And before we had slaughterhouses, when we killed an animal, especially a big one, all the blood would effectively fertilize the spot where it died. Would it not? It would probably be too hot and kill the plant in the short term, but would this not make the grass grow a little greener next season? After observing this for generations, does it not make some sense that we would draw the conclusion that animals dying somehow pleases the gods?"

"Whoa!" exclaimed Hero, "I've never thought about it that way."

Grace added, "And early burial sites as well..." fading off in a distant tone. "If people decided to begin burying their dead in a particular location, how long would it take before the nutrient load from those bodies could be reliably

observed? Wouldn't we also expect the grass to grow back a little greener over a grave? Over generations, would that not make a traditional burial ground distinctly special—not just in a spiritual sense, but in a phenomenological one as well?”

“Yeah!” Esri said. “But I think a lot of cemeteries around the world have become ecological time bombs of sorts. I wouldn't drink the ground water near a cemetery.¹³⁵ When we started embalming our dead, we effectively added synthetic poisons to the mix, turning grandma into a problem for the earth instead of a fertilizer.¹³⁶ But what you say about ‘the grass grows greener’ makes perfect sense to me in a natural burial context.”

“Last year's death becomes next year's life,” Hero said, reflecting back on the wisdom of the Gardner.

The three of them stared at the salmon for a while longer in silence before walking back to the car. Grace and Esri went to the bathroom, and Hero walked over to check out the tree in the chain-link cage. It was sort of a bizarre sight: a tree inside a cage. It wasn't all that uncommon to see fencing around trees to protect them from deer, but this cage was particularly intense.

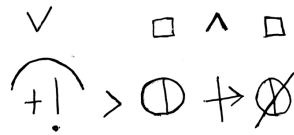
It made more sense once Hero got close enough to read the plaque, which explained that the apple tree had been grafted from an apple tree that had been planted by the first white people to settle here some 150 years ago—but which had recently died. Smiling, Hero thought that in some sense, this was a monument to our capacity to deny death. We can see that an apple tree is

¹³⁵ Józef Żychowski (2012) “Impact of cemeteries on groundwater chemistry: A review.” *Catena*. Journal article.

¹³⁶ Chiappelli and Chiappelli (2008) “Drinking Grandma: The Problem of Embalming.” *Journal of Environmental Health*. Journal article.

sick and dying, so we cut off a limb, and propagate it by grafting it onto a strong root stock, effectively creating an upper body clone. Then we put a cage around the tree to make sure that nothing else tries to eat it until its branches grow out of reach of the animals that roam the forest floor. She noted it would have been unbearable to live in that cage as a human... but the tree didn't seem to mind.

After Hero had been pondering the caged apple tree for a few minutes as if it were a piece of contemporary art, Esri and Grace returned and the three of them piled into the car for the drive back into town. They sat in relative silence— each integrating the experience in their own way.

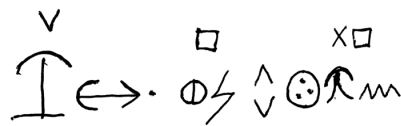


Once home, Hero sautéed some vegetables and tofu and made a pot of rice—feeding the scraps to her worms. Eating, she reflected on the trajectory of the week and took stock of making peace with the decomposers. What had started as an opportunity to feed food scraps and yard waste to the decomposers, had quickly expanded to include her own bodily waste. The conversation about the gut microbiome had instilled in Hero the vision that all people are powered in part by the anaerobic digester located in the center of their body. It was not just that Hero had fed the scraps from her cooking to the decomposers, or that later on she would feed the leftovers of her digestive process to the decomposers, but that right now— and every other time she has eaten something— Hero was feeding what she came to think of as the decomposers in her gut.

She thought that it became harder and harder to maintain clear boundary or distinction between humans and nature when looking at the relationship through this lens. Or maybe it was just easier to see the interconnection between humans and nature when you focused on the

decomposers. Either way, she was happy with where she was now. In some sense, she felt that she had found herself in the circle of life, and having seen it, she had the feeling that she wouldn't be able to unsee it. Her home was an ecosystem, and she was embedded within it, whether she liked it or not.

Today she had realized that even in death, one can become food for the decomposers. Hero could not imagine a more intimate set of narrative plot points for understanding oneself as part of the larger life around them than spending a lifetime feeding the decomposers with activities like cooking, eating, and using the bathroom, with the understanding that when the time comes, the body through which I have spent a life time feeding the decomposers, will itself become food the decomposers.



Hero had realized some years ago that, for her, jumping on a skateboard was the quickest path to something like mindfulness.

Nothing cleared her head like applied physics.

On a skateboard there is an implicit —and occasionally painful— feedback loop for anyone who lets their attention slip from that which is directly in front of them. This time was no different. As soon as she started picking up speed going down the hill, the decomposers disappeared and all she saw was crack, crack, rock, curb cut, no car, driveway, crack... and so on until she got to the park, where it switched, and she spent the rest of the night trying tricks while dodging kids on scooters.

Reunderstanding

Day 5

"I Tell them that I'm doing fine, watching shadows on the wall"

John Lennon¹³⁷

"When we try to pick out anything by itself, we find it hitched to everything else
in the Universe."

John Muir¹³⁸

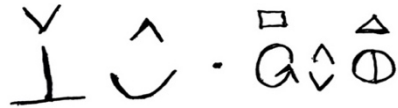
"Holy shit, I'm the holy shit; I'm God's manure."

Lil Wayne¹³⁹

¹³⁷ John Lennon (1981) "Watching the Wheels" *Double Fantasy*. Song.

¹³⁸ John Muir (1911) *My First Summer in the Sierra* (Sierra Club Books 1988 ed). Book. p.110

¹³⁹ Lil Wayne (2015) "Glory" *Free Weezy Album*. Song.



Hero woke up early the next morning. Early enough to lay in bed and watch the sun rise and transform the sky. There was condensation on the window; and lying there in bed, Hero thought about the chemical reactions occurring through the night that had pulled this water out of the air. He thought about how with each breath we exhale water vapor into the air, and wondered ‘how much of that H₂O was in his body the night before?’

He looks down at the Philodendron underneath the windowsill and thought about its respiration cycle and how it paired so well with his own. Each consuming the gasses created by the other. He’d always been fond of the plant but thinking about it this way gave him a new kind of appreciation for all the plants in his room. Looking around at the few of them, he imagined that this was indeed *How to Grow Fresh Air*.¹⁴⁰

Hero cringed a bit while brushing his teeth, thinking first about the war zone in his mouth from the perspective of the microbes living in there, followed shortly after by the vision of the casualties of this particular battle disappearing down the drain. Another activity that could be understood as a point of connection to the circle of life. Another place where Hero could feed the decomposers...

Standing over the toilet watching the stream of yellow liquid filling the bowl he flashed back to a childhood memory of his friend Fritz’s dad who would encourage them to ‘fertilize the plants’— which was his euphemism for peeing outside. Flushing Hero wondered what the N-P-K Ratio of human urine was? Reaching for his phone and realizing it was still plugged-in on the

¹⁴⁰ B. C. Wolverton (1997) *How to Grow Fresh Air: 50 Houseplants to purify your home or office*.

bedside table: his pajamas didn't even have pockets. So, he made a mental note to ask google later before stripping down and jumping in the shower.

Soaping up he realized that it wasn't just dirt he was cleaning off his body, but that this was yet another assault, this time on the microbes colonizing his skin. Looking down he imagined all those dead and dislodged bodies embarking on the journey to the decomposer's paradise in the bowels of the city.

An hour later, while cooking he thought about the cycles that brought about the ingredients he was preparing. With coconut oil sizzling in the pan, he imagined how the kale was connected to the world: to the atmosphere through respiration, the solar system through photosynthesis, and the soil system through roots. He thought about all the grains and grubs that fed the chickens that produced the eggs. He envisioned the carbohydrates stashed in the soil now appearing as potatoes in the frying pan, and the carbohydrates packed into seeds that were ground up and transformed into bread.

These ingredients were all plucked from their respective places within the circle of life... A week ago, Hero probably would have felt alienation at this realization, thinking of himself as a thief, stealing the food stuffs. But today, somehow, he felt more at peace with his identity as a consumer. He'd found some deeper meaning in the term, a sense of consumer identity much deeper than capitalism... He now understood himself as a consumer in a trophic sense. Always. If he felt lost or disconnected from the natural world, he could orient himself as a consumer—through his relationships with the producers and decomposers.

Eating plants and animals while feeding bugs, bacteria, and fungi offered a consumer identity even deeper than humanity. Being a consumer in this way *was* something shared with *that* Squirrel.

While eating Hero thought about how he fit into the natural world... and felt pretty good about it. The atmosphere was in every breath, and every breath was in the atmosphere.

The water in the ocean, was the water in the sky, was the water in the coffee.

It was these simple things like eating, and pooping, breathing, and feeding that provided this sense of integrity, of connection, of identity.

He'd spent so many years working hard to find such a sense, but somehow the sense of integrity he'd now found was in the behaviors that could hardly be considered work.

How many times had he taken a break from doing homework about climate change to sit on the toilet and contribute directly to the carbon cycle?

How many conversations about the problems associated with synthetic nitrogen run-off, and algal blooms had occurred without mention of the fact that the people engaging in the conversation have bodies that produces a nitrogen rich liquid that must be drained multiple times a day?

Have we missed the forest for the trees when it comes to relating ourselves to the natural world?

After thinking for a bit, Hero decided that regardless of what *they* were doing, he'd found the forest, so other's projections weren't going to get in the way. They simply couldn't. He'd seen things in a way that he couldn't unseen.

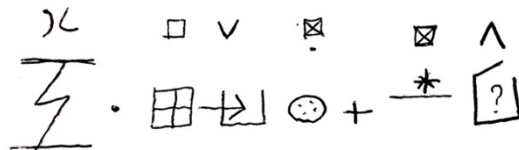
Indeed, it occurred to him that for the first time in years, he was more concerned with finding his place in civilization than the natural world... and that thought just made him laugh, out-loud and alone for a few good minutes.

He had genuinely thought this day would never come. But here it was.

On to the next great adventure, time to figure out where he fit into the working world; Hero needed a job.

After all, those years of searching in college had earned him a degree, but also a hundred-grand in student debt... It was time to get back on the traditional trajectory for a recent college graduate. Time to update the resume, to start the job search, to find a place in the working world. This thought brought a creeping sense of anxiety flowing over his body.

Hero decided to walk down to the cafe and work on his résumé there— being in public view, always helped hero stay focused on his computer. Being a social animal, he'd always found it easier to do something when surrounding by people doing the same thing, using the herd mentality to one advantage. And in this town, the easiest way to immerse yourself in a crowd of people on laptops was to go to the coffee shop.



The words floated around in his head as he stared at the screen trying to figure out how to arrange them so as to convey his personality, skills and work history all at once, in a single page. Writing a résumé felt like distilling one's value down to a single page— an activity that always left Hero feeling a bit insecure. It seemed so arrogant to tell the truth and say 'I'm trying to help save the world'— even though that is the thread weaving together the last five years of his life— it's an absurd claim to put in writing. Felt a bit like greenwashing but personal, the last thing Hero wanted was to present himself in 'Green-face'.¹⁴¹

¹⁴¹ Green-face is like greenwashing but applied to the individual—as opposed to the corporate—identity.

Feeling the need for structure Hero googled “résumé templates” and spent 20 minutes looking through different layout designs, eventually deciding to hybridize two of them. Once he had the format set, he began to fill in the details first draft style (with emphasis on getting it out there coherently rather than making it pretty and grammatically correct).

Hero made it through work history and was listing his skills when his attention started to wander again, not out of some inner sense of procrastination but instead because there was something going on in the cafe that was rather interesting...

An older man was sitting a few tables away hunched over the planter box that encased the patio peering through a magnifying glass at something that was exciting him. It was a bit out of place to have someone peering through a magnifying glass on a patio and half a dozen other people all focused on their computers, but what really caught Hero’s attention was the man’s body. He had the energy of a kid, or sports fan watching the game. One who’s watching something so intently that you can feel the energy in their posture...

Hero watched the man watching...and looking around, he saw that he wasn’t alone in watching the watcher. There was just such a kid of about eight gazing from across the patio standing by his mother’s side. The mom was engaged in conversation with a man who’d also been sitting at a table alone on his laptop...

When the man with the magnifying let out a little ‘yeeep’ and started shaking the littlest bit in what was clearly excitement, the boy started to cross the patio—approaching the man somewhat transfixed. He was just feet from the man’s table when the mother noticed and called him back loud enough that the man with the magnifying glass looked up, read the situation in a second or two and said,

“Ohm oh please. He’s fine. I’d be happy to show him. I was just watching these ants carry this ginormous breadcrumb back home across this planter.”

“Oh, no, that’s fine, thank you,” the mother replied. “We need to get going. Got to pick up your sister—come on now” she said gesturing to kid who looked a bit crestfallen yet resigned—showing no sign of fighting the order.

After the mother and son left, the man with the magnifying glass sat there looking a bit crestfallen himself. His eyes eventually caught Hero’s and with a shrug he said, “Well, you win some, you lose some.”

Hero matched the shrug and said, “I’d kinda like to see the ants— you make it look fun! I’m not surprised you caught the kid’s attention.”

The man smiled and said, “By all means,” holding the magnifying glass out over the planters in a gesture that welcomed Hero over to take a look. Shutting his laptop and momentarily forgetting about his résumé, Hero walked over, the man handed him the magnifying glass and pointed to a spot in the planter saying, “There’s some serious gathering going on down there.”

“This is quite the spectacle,” Hero said as he peered through the glass and saw the little group of ants carrying the breadcrumb. “The difference in scale is crazy!” he noted. “I can’t help but imagine three humans trying to carry something that large in proportion to their bodies. It’s like of us carrying home an elephant for dinner.”

“The ants are pretty impressive,” the man agreed. “I think I let out a squeal earlier when they managed to get it up onto the rim and push it over into the

planter... two of them pushed it from below while the others climbed up, reaching over and grabbing it from the top and pulling.”

“I heard you, so did that that boy,” said Hero. “It’s so dramatic when you watch on this scale.”

“Make no mistake, there’s a never-ending story all around, and the right piece of glass offers a window through which we can witness the endless drama unfold.”

Smiling Hero straightened up and said, “Well you’ve got me wanting a magnifying glass of my own” as he tried to hand it back to the man.

“Well, you could have that one if you’ll promise to use it?” putting his hands up in the air, in an expression that communicated ‘It’s yours: if you want it.’

“Really?” asked Hero, adding “I’m not sure I feel good about taking your magnifying glass.”

“Oh please” he said, brushing his hand aside. “I have plenty. I try to give away one every day.”

‘Give one away every day,’ Hero thought, this was getting more bizarre by the moment. The idea of taking possession of the magnifying glass was exciting, but it still just didn’t quite feel right to accept a gift from a stranger, so he asked the man the only question that did seem to make sense, “Why?”

“When you get to my age you start thinking about your legacy. What you’re leaving behind. I started thinking about my legacy— both in a personal sense and a generational one— and well, I felt compelled to do something I felt good about leaving behind—other than my kids of course...”

I played a minor role in the creation of this digital universe we all spend so much of our time living in, and, well, this worked out great financially, but being my own worst critic, it also put me in a position watch closely the ways in which digital technology is reshaping our relationships to the world. People don't realize that the early internet was fueled in part by a vision of digital utopianism... now don't get me wrong, I don't think it's all bad. But It went *From Counterculture to Cyberculture*, and I fear we're losing our awareness of the world around us.¹⁴² We're all splitting our attention between physical and digital space. And as time has passed were spending more and more time in the latter, and I think we're losing sight of the former. We're living in ways that don't feel healthy— for us or the planet.

I was sitting in the park one day and I noticed that almost everybody seemed to be dedicating the very minimum amount of attention necessary to navigating the physical world around them, and virtually no one seemed interested in exploration. My own nieces and nephews would spend hours getting lost in digital ecosystems, but for the life of me, I could not hook their attention long enough for them to get lost in the bark of a tree for five minutes! ... This haunted me, and then, one day, it just hit me, magnifying glasses!"

"Magnifying glasses?" Hero echoed back.

"Yes," the man said. "The message I wanted to communicate was something like 'Don't forget to look closely at the world around you' and what better way to say

¹⁴² Fred Turner (2006) *From Counterculture to Cyberculture: Stewart Brand, The Whole Earth Network, and the Rise of digital Utopianism*. Book.

that than looking through a magnifying glass? You see, with age I've come to see that ultimately *the Medium is the Message*.¹⁴³

So I bought a magnifying glass and started carrying it around in my pocket, and using it. In public. And, if I'm honest, especially when I was surrounded by people looking at screens," gesturing around at the patio's occupants, "I enjoy the juxtaposition."

"Hmm" hummed Hero, intrigued but still not sure what to make of this eccentric.

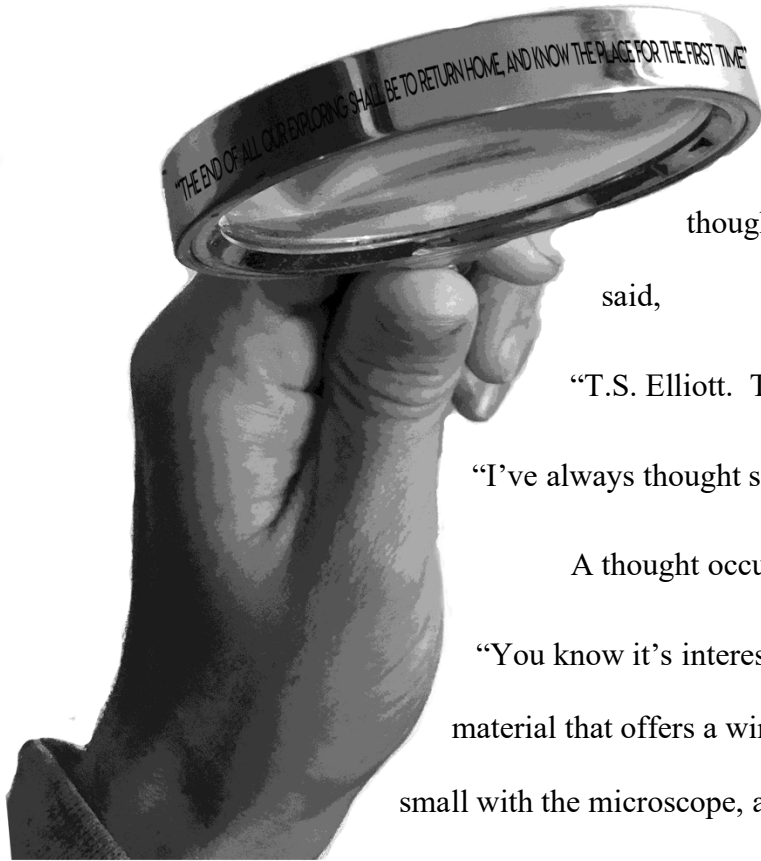
"The Medium is the Message—I like that, but why did you start giving them away?"

"Oh well, because it worked. People noticed—usually children, but not always—and after parting ways with a few people who got genuinely excited about what they saw, I realized that if I wanted to do it right, I should be sending them away with this little window into a bugs world... and well, like I said, I had something to do early on" he said gesturing around the patio again at the people sitting with screens in front of them, "so I can afford a few grand a year in magnifying glasses for the privilege of being able to give them away. I even found a place last year that'll engrave them. See here," he said pointing to the metal band holding the glass in place.

Turning it sideways, Hero read the words inscribed along the band encircling the glass,

¹⁴³ McLuhan and Fiore (1967) *The Medium Is The Message: an inventory of effects*. Book.

“...But the end of all our exploring shall be to return home, and know the place
for the first time.¹⁴⁴”



Smiling because he
recognized the quote and
thought it was rather well placed, he
said,

“T.S. Elliott. That’s a good one.”

“I’ve always thought so” said the man.

A thought occurred to Hero, and he said,

“You know it’s interesting to think about glass as a
material that offers a window into scale; both incredibly
small with the microscope, and absurdly large with the
telescope... and I guess, the thought I was having is that there is

some sort of cosmic parallel in the material itself. My understanding is that glass
is naturally occurring when lightning strikes sand... and well, that moment, that
point of contact—direct energy exchange from the sky to the earth should create
just such a material that once shaped could offer a literal window into both the
depths of the earth and the vastness past the sky... is well, kind of poetic.”

¹⁴⁴ T.S. Elliott (1943) *The Little Gidding*. Poem.

“Wow” the man said, “I’ve never thought about it like that before, that’s a nice vision... thank you for sharing *that*. I’m going to have to ponder it for a while, but I think your right, there is something poetic there.”

“Thank you for the *This*” said Hero, holding up the magnifying glass.

“Oh, trust me, the pleasure is all mine” said the man.

Ten minutes later the man was gone and Hero was back at his table trying to refocus his energy on his résumé, but the new magnifying glass in his pocket weighed heavy on his attention. The urge to explore was strong. And after a little while hero gave in, closing the laptop and wandering out of the café with magnifying glass in hand with the intention of using it.



The first thing that caught his attention was a was a little bunch of feathers that auspiciously blew across the sidewalk like tumble weed. He chased it down into a corner, squatted down and got really close.



Next, he noticed the littlest new buds on a pine tree and stood up close for a look at them.

And so, on and so on... Hero spent the rest of the afternoon getting lost in exploration of the world around him, with the magnifying glass.











...And then suddenly it just hit him, like a ton of bricks, as he was watching this little roly-poly with its babies... It was so simple, and yet, somehow, he had never quite seen it before.

You can trace any leaf on the evolutionary tree of life back to the base of the trunk!

Back to the very beginning: *Life is a lineage.*

What we find in the present as circles of life, overtime through reproduction become

links in a great chain of life. Just the fact that this roly-

poly was here, in front of Hero, meant that it was the embodiment of an unbroken chain of life that went back to the beginning.

This wasn't just true for *this* life—but for life in general.

To notice a tree, or a bird, or dog, or

bug, or bacteria is not just to see life in the present, but to know that

life is here because it is part of a lineage that has persisted over unthinkable periods of time.

If he had a time-machine and could travel 1 million years back, both his and these roly-poly's ancient ancestors would be there. Of course, it would be nearly impossible to actually locate them, but theoretically, they would be there none-the-less. Just the fact that something is alive today means that if you could go back 16, 32, 64, or 128 million years ago—the lifeforms you're looking at in the present would have living ancestors in the past.

Perhaps the story was even larger than the circles of life... Maybe all those circles of life formed links in a great chain of life.



He walked for a while after that trying to integrate this new thought. He'd found himself in the big park on the edge of downtown with its seemingly endless trails, meandering somewhat aimlessly. *There* was life. *There was* life. *There was life*. He thought to himself as he walked.

Hero had become so distracted looking at all the life on the ground, that he walked right into a little tree branch hanging down over the trail.

After recovering from the shock of knocking one's head, he refocused, and brought the magnifying glass up to inspect the branch, and yes, just as he suspected, there was life there *too*.



He was looking at the branch, wondering if impact of his head had triggered any particular response in any one of the three species he could see, when he heard a familiar voice say,

“Hello Hero! Fancy running into you here!”

Startled a bit, Hero turned and saw Rachel, the gardener, walking along the path toward Hero, “Oh hello Rachel, you startled me a bit, I was lost in a bugs world,” he said rather sheepishly.

“Oh, that seems like a fine place to get lost to me,” said Rachel, “Are we still on for Sunday morning at the Garden?”

“Yea, definitely,” said Hero. “I’m looking forward to it”

“Me too. Yesterday I finished spreading out the compost around the back orchard with a couple other people, so on Sunday we can get you all set up with your own plot if you want?”

“Oh yea, I’d love that,” said Hero.

“What are you up to this evening?” asked Rachel,

“Oh, nothing much, just been walking around looking at things through this magnifying glass I got earlier from this eccentric guy at the coffee shop... I’ve got nothing else in particular planned.”

“Well, it’s sort of serendipitous running into you here and now... I was going to talk to you about this on Sunday, but I’m actually on the way to a support group of sorts that’s meeting over on that side of the park pretty soon?”

“What kind of support group?” he asked

“Well, it’s not official in any particular capacity, there’s no formal organization, just a score we organize around... I know a couple people think of it like a secret society, but I think of it like a support group. It’s really just a group of people sitting in a circle around a fire listening to each other, really listening— without casting judgment or jumping in to fix things.

It’s a safe space for sharing your experience—which, maybe I should point out, often means it can be pretty dangerous listening¹⁴⁵. But we came together around this idea of building support structures that help us live with the existential crisis

¹⁴⁵ It’s worth highlighting this difference between ‘a safe space to’ and ‘a safe space from’ because there is an inherent tension between these two kinds of safety that in my experience, too often goes unacknowledged.

of the Anthropocene. It's support group for people working on recovery in the broadest sense of the word. I was reflecting on our conversation in the garden, and I think it might be helpful for you too.”

“Oh cool, yea,” Hero said, feeling caught off guard but resonating, and intrigued.

“I would be interested in checking that out, I had no idea such a group existed around here.”

“Well, we don't advertise, it's sort of invite only, and one of the few rules is not talking about what happens in our meetings... So, in that way we are a bit like a secret society.” She added with a chuckle “Or fight club.”

Smiling at the reference, Hero asked “Why the secrecy?”

“Because it's about us; not them.”

“Isn't that kinda selfish?” Hero said. “I mean, no offense but...” and sort of shrugged.

“Yeah, maybe, but *this* is something we really do for ourselves. We do grow numbers, but it's always initially through personal connections—as I am inviting you— that way the groups grow slowly with a curator's eye. We also meet in public, so sometimes people just happen upon us too. Once groups get big enough that everybody can't comfortably sit around a fire and still hear each other, we'll split up, and become two groups. Some people move and bring the process other places, or visitors come through town sit in on a meeting of two and then bring the experience back with them. That's how our group started, someone

from our town visited a friend in another place, got to sit in on a meeting, and brought the score back with them.

So yeah, maybe it's selfish, but we're building a different kind of foundation—not a 501c3, a level slab, or a primary text—the foundation we're working on is decentralized...autonomous... and well, self-organized. It's a fundamentally different model. More like a fractal than a pyramid...but also, "she added circling back to the beginning before finishing with, "sometimes being selfish is okay."

"Well, I guess, thanks for inviting me," said Hero.

"So, do you want to come?" asked Rachel, adding, "If so, we should probably start walking over there. I'll give you a run down on the score while we walk."

"I'm in. Sounds good" said Hero, quickly adding, "what's a 'score?'"

"Well, I use the term as you would in music or dance—it's something like a set of instructions that are acted out or performed."

"Like a script?" Hero asked, as they started walking.

"Kind of" said Rachel, "but a script has lines—a score has movements"

On the way over Rachel began to explain, "We'll go to the fire pit and mingle around getting settled, while a person or two stage the fire. Once we're all sitting in a circle, on the ground, someone will light the fire and well sit in together in silence while it catches... Once the logs get going the first person—that is whoever acts first— would grab the talking water and b—"

Hero interrupted, "Talking Water?"

“Of yes, of course, there will be a water bottle that is place near the fire before we start... and well, have you ever heard of a talking stick? Or rock? — you know, some object that’s passed around a group to signifying who’s turn it is to speak?”

“Oh, yes” Hero said, “I am familiar with such a practice”

“Ok. Good. So, yea, we use a vessel containing water as our talking piece... because, well, actually for a few reasons, for starters your body is mostly water, water carries sound and absorbs energy, and so in some sense the idea is that your words can resonate within it.” Pausing for a moment on two as they walked before continuing, “And well it’s also part of a deeply human trinity, you know, starting fires, holding water, and sharing thoughts aloud are some of the earliest behaviors that set us moving on the trajectory to where we are now. In other words, it’s an homage to our ancestors.”

“Fire, water and language,” Hero said. “I like that.”

“Me too,” answer Rachel. “So where was I, yes. We sit in silence while the fire catches... Once it’s really going the first person —any person— grabs the Water and begins sharing with ‘My name is _____ and today I’m feeling _____’ in a sentence or maybe two. The water is then passed to the left, where the next person follows suit, and so on until it goes all the way around the circle. Then, on the second and third time around the circle you can share whatever you want, and we’ll listen... to whatever you want to be heard...

While nobody interrupts the person speaking, there are some hand signals some people use to demonstrate active listening throughout the gathering,” Rachel said,

and continued to model each signal as she explained it. “Raising your hands and waving your finger was something like applause, a positive reinforcement, good news. A clenched fist showed that anger was resonating. A limp wrist with fingers hanging down communicated a milder negative judgment— like bad news, or stupid people. Finally, the hands cupped in a bowl signaled the offering of emotional food, something like a warm bowl of empathy.

After the water had gone around the circle again giving each person the opportunity to speak three times, there would be an open floor where the bottle got placed by the fire and anyone could go pick it up and say more... Once it sat there for over a minute, someone would get up, open the bottle and pour it on the fire— releasing the captive water (with all its embodied emotions) back into the atmosphere and putting out the fire. Or at least dampening it... at which point the gathering was technically over, but usually followed by an hour or two of hanging out, sharing food, and decompressing.”

Partially pulling out two foil wrapped bars from her bag, Rachel had said, “At the very least, I think we should all have a little bit of chocolate afterwards...”

And then just as they approach the group gathering around the fire pit Rachel added “Its fine to share as much or as little as you want,” and reminded Hero " But this is all privileged information, it's confidential, so please don't repeat anything you hear in the circle around the fire. Before and after are open discourse, but what happens in the circle, happened in the circle, and it stays there”

And so, as they joined, Hero obliged and filed the experience under ‘confidential’ within his memory library.

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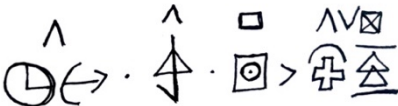
[Redacted text block 2]

[Redacted text block 3]

[Redacted text block 4]

[Redacted text block 5]

[REDACTED]



He stood there; fourth in line. Watching. He was watching as another member of the group had turned one of the adjacent picnic tables into a little screen-printing studio and started making shirts with the same triangle inside the earth insignia, he’s seen on a bumper sticker the other day. As he stood in-line, Hero listened to the printer described,

“I know! It’s a fascinating technology... I like to think of it as one of the things hiding behind the emerald curtain. You know, one of the technologies that Nike has behind the walls in their factories that empower them to imprint clothing with the significance of their own logo. The tool that gives them the power to offer people the privilege of exchanging their own labor for the opportunity to dress themselves up in corporate identity... and frankly I find it offensive, that the most powerful icons of our time are no longer used communicate one’s values,

but rather confer value onto products. I think the artists have a responsibility to society, we're the ones who inherited the visionary's toolkit... and we've lost sight of that responsibility. We've made a deal with the devil. We've traded our ability to project cultural identities in favor of projecting corporate identities—and I think we're living out the consequences of that shift...

Of course, those corporate products are mass produced on an assembly line and have what I would characterize as a distinct lack of soul— that's just me—but the point is, when it appears they're doing magic, if you look, back there, behind the emerald curtain, more often than not you'll find it's just a nifty tool that some artist is wielding.”

“But how does it work?” asked the next person in line, gesturing to the frame the printer was holding.

“Well the principal is actually pretty simple” he said— holding up what Hero could now see was clearly a repurposed picture frame with the earth-triangle image in the center, “Think about like a window screen and how it's mesh constructed out of interwoven strings, and how it creates spaces in between that allow air to pass through— well if you look closely here,” holding up the screen, “you'll see that there's a much more tightly woven mesh that I have stapled around the edges and pulled tight to fill the frame. Next, I coated the mesh with a photo emulsion in a dark room — basically a light sensitive paint that fills in all those holes in the mesh. Once it dried, I exposed it to light while using a high contrast image printed on a transparency to block light from curing the emulsion in the exact pattern of my image, so that when I rinsed the screen out with water right

after exposing it to light... all of the uncured emotion just washed away, while the parts exposed to light hardened to the point where it would need special chemicals to be washed out again.”

He put the screen down, and pulled out a shirt from the pile, and laid it out on the table—brushing out all the wrinkles with his forearms, “And once you have the screen made, you put ink on top, put the screen in place, and use a squeegee like this to push the ink through and onto the tee-shirt—or whatever else your printing”

He demonstrated— eventually lifting the screen to reveal the iconic image now emblazoned over the heart. Picking up the shirt carefully so as not to fold the wet ink back on itself he continued,

“I’m using a water-based ink, so they’ll dry pretty in a couple minutes if you go hold them up close to the fire, and maybe a half hour if we leave them sitting here.” He finished and left the shirt on the adjacent table.

“That’s the process! Now it’s your turn—just find a shirt, something you like, and then print it” He said, gesturing to the pile of clothes.

The few people in front of Hero started picking through the pile, while one of them asked, “Where did you get all these?”

“Oh, some combination of garage sales (I have to stop at everyone I see) and friends who know me, and that fact that I’m obsessed with this process of reclaiming clothing, that they give me their old ones.”

“Why are so many of these shirts inside out?” asked someone else.

“Because most of them already have things printed on them. Flipping them inside-out is a fast and easy method of recycling... It’s almost so simple that recycling isn’t the right word, maybe reappropriating or reclaiming is more fitting”

As the printer helped the first person print their shirt the second person asked, “Do you ever use new shirts?”

“Rarely” answered the printer. “And if so, only because they’ve found themselves in post-consumer waste stream without ever actually being consumed in the first place... which unfortunately happen more than you would think. Honestly, I do my best to stay away from virgin stuff in general, things just feel better to me the more of a history they have. So long as it’s still functional, I’d prefer to have something that’s been used by someone else for a decade.”

Holding up the screen as the first person finished printing, he continued,

“Look, you know 99% of screen printers would use a brand-new frame built specifically for screen printing, but I’d prefer to use this picture frame I got at a garage sale— not just because it’s cheaper, or saves resources, but because I like looking down and imagining the life it had before. This vessel that once held an image, perhaps a family photograph or a children’s piece of art, has grown up into a tool that reproduces images.” He shrugged, “I’m sort of a romantic when it comes to these things.”

“Ahh what we could learn from the hermit crabs,” said the next person in line as they laid down their shirt, and the four of them all laughed a little.

Hero was now second in line and was up to the pile of clothes— sifting through, first holding up a blue one that turned out to be too big, then a grey one that was too small, and eventually settling on a white one with a pocket.

The person in front of him asked, “How did you get into doing this?”

“Well, I used to make a lot of art that I put up on the walls—occasionally I still do—but after I came across this process, and realized how easy it is I just got obsessed... I tend to think the medium chooses the artist, and not the other way around... And, well frankly, I think if there’s one thing we pay more attention to then the images on the wall, it’s the images we choose to wear. I just like the story of clothes better... they move through public and private spaces.

You know, in the graffiti world it’s a big thing to throw up on trains and, well, part of that is knowing that those trains effectively take your piece on tour around the country where thousands of people get to see it. I would argue the same is true for clothing. If you put an image on an article of clothing, it can find its way into all kinds of interesting venues that would otherwise be inaccessible. You can’t just put up a poster in a grocery store, or a classroom, or restaurant— but if your medium is clothing it can be all three places in a day. Sometimes I wonder if my work has ever been arrested, I mean, hope not, but you never really know...

And also, how do I say this... one day I realized that I was done making work about change and was, well, ready to make work that *was* change.”

It was Hero's turn now, and he laid out his shirt on the table, using his forearms to flatten out all the wrinkles and asked, "Can we print over the pocket?" wanting the image to cover his heart.

"Yea, the line might get a little funny right at the edge, but I'd say go for it and see what happens," said the printer.

Gesturing down Hero asked, "What does it mean?"

"What does it mean?" The printer repeated to himself aloud as if thinking, "I'd say it's an image without an official definition, but I would say it signifies a story, and it connects people who have faith in that story. It's just a symbol. One simply uses the symbol to reveal oneself to other believers— in the hope that they might help one with the quest."¹⁴⁶

¹⁴⁶ J.K. Rowling (2007) "Harry Potter and The Deathly Hallows" *Scholastic* (US ed.). p.404-5.

Hero had just pulled the squeegee across the screen and was still a little unsure what it meant. Pulling up the screen and handing it back to the printer, Hero carefully picked up his newly printed shirt, holding it in front of him with both hands and asked, “But, what *is* the quest?”



Smiling the printer said, “Recovery: *in the Whole sense of this world.*”

The End.

Semantography Key

The pictographic sentences that appear throughout Hero’s journey are written in the language of Semantography, which is also commonly known as Bliss Symbolics, after its creator Charles K. Bliss. This language and its creator have a long and complicated story. The “Mr. Bliss” Radiolab segment provides a great introduction to the complexities of this language’s origin, development, and contemporary use¹⁴⁷. And today the Blissymbolics Communication International is a non-profit, charitable organization that holds the perpetual, worldwide rights for the use and publication of Blissymbols.¹⁴⁸

For the purposes of this thesis, I’m just going to touch on a few aspects of the story that drew me in...

Charles Bliss, a Jewish survivor of both Dachau and Buchenwald— He became obsessed with the idea that a structural flaw in the way we use language enabled the perpetrators of the holocaust to convince themselves that what they were doing was right. He saw that the interpretative space between the signifier and signified could be manipulated to justify evil. By changing the meaning of words already in common use, people could be persuaded to go along with drastic changes to society without an awareness that of what they were actually doing. Like the doublespeak phenomena Orwell described in 1984; *the Ministry of Peace is constantly at war*.







After the war, as a refugee— first in Shanghai, then Australia— bliss became obsessed with the idea that if we just had a pictographic language, it would be much harder to lie and mislead people in writing, going so far as to imagine that such a language could end oppression and rid the world of evil... He devoted the rest of his life to crafting a pictographic language.

I’m skeptical of such a claim, but I do believe he stumbled onto something profound. Bliss was trained as a chemical engineer, and so when he set out to draft such a language he turned to the periodic table of elements for inspiration. Basically, He set out decompose all human communication down to its most simplistic and basic elements and then created a visual symbol element. These elements could then be arranged in different combinations to represent a whole plethora of messages we might want to communicate. In Bliss Symbolics, the position, orientation, size, combination, and the indicator symbol all get analyzed together to derive meaning. Often what appears a simple change can change the meaning of the whole pictogram. For example:

A CHANGE OF INDICATORS MAKES ALL THE DIFFERENCE

377
(1965)

The practicability of these two new indicators shall be demonstrated on a few examples. Let us take the liquid water. We can water surfaces. They were then watered. But not all surfaces will become wet. Waxed surfaces are not wettable, just as certain surfaces are not paintable with certain paints but can become painted with special paints.

					
water	watery	to water	watered	wettable	wet

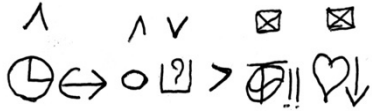
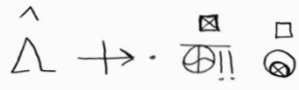


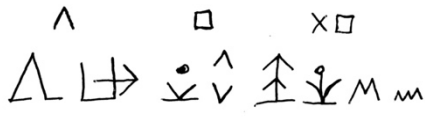
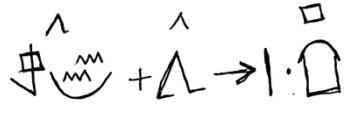
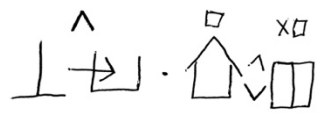

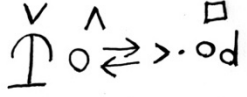

In 2016 I was lucky enough to get my hands on a copy his nearly 900-page volume *Semantography: A Logical Writing For An Illogical World*¹⁴⁹ and too this day it is one of my most prized possessions. Charles Bliss is one of my favorite eccentrics whose work I love introducing people to. I wanted to give Hero’s journey a mythic feeling. I’m hopeful that interspersing symbolic sentences was a way of doing both.

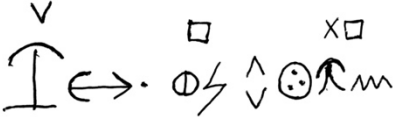
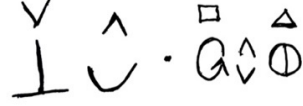
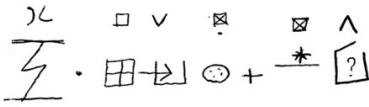
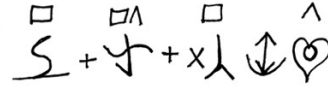
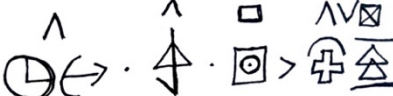
The following table offers rough English translations to the Blissymbol sentences used throughout this narrative particular.

¹⁴⁷ Tim Howard (2012), “Mr. Bliss” *Radiolab*. WNYC studios. Radio program.

¹⁴⁸ For contemporary use of Blissymbolics, I suggest the Blissymbolics Communication International website: <https://www.blissymbolics.org/>

¹⁴⁹ C.K. Bliss (1965) *Semantography: A Logical Writing For An Illogical World*. Semantography (Blissymbolics) Publications. Book.

Page Number	Blissymbolic Sentence	Rough English translation
3		Waiting to ask a question about climate change negative emotions.
12		Walking past the climate change machine
14		Walking into the place where many things tree, flower, animal and insect.
19		Open to receive language about all things beginning
28		Walking out of the place with many things tree, flower, animal and insect.
38		Holding worms and walking back to the house of knowledge
50		The self, entering the House of Many Books
65		Leaving the house of many books holding language and many thoughts
71		The self—having a conversation with a song.
77		“departing to the place where the opposite of useful things arrives”

169		I will become life energy for the decomposers
172		I hold the circle of life.
175		When lightning connects sky and earth a window into many things bacteria and many things stars might open.
194		Fire on the ground, holding water in hand, many people exchange speech from the heart
202		Waiting in line to make an image of medical care in the mind for all things meta-natural between earth and sky.

On Hero's Identity

By now you've probably realized that Hero's gender appears to change on a daily basis. There are a couple of ways to interpret such a change. One might imagine Hero as a gender fluid individual whose pronouns change daily, however, that wasn't exactly my intention. I had my own reasons and think it is worth taking a moment to explain my thinking on Hero's identity...

First, I don't actually see Hero as an individual character at all. Instead, I think of Hero as an archetypal person—one who is not identifiable through a consistent bodily identity but rather through a sort of generational positionality and a particular internalization of the socio-ecological problems of today. Hero is somebody who lives in an industrialized modern society and struggles with the emotional weight of knowing how to find oppression, degradation, and pollution nearly everywhere. Hero was an empathetic child who listened and took seriously the preposition 'it's gonna be your generation's responsibility to fix this!'...and so, in my mind, Hero is an archetypal representation of this subset of the living population who took on the weight of the world's problems.

This is an experience I *know* well. I spent years in *that* place. Those who identify with such an experience *are* my target audience. It was only through hitting rock bottom that I was able to trace a path back into a coherent self-narrative—one where I wasn't the villain or victim but simply playing an active role in the circle of life... and *this* is the story I am attempting to tell through Hero's journey.

One might wonder, '*what's this archetypal Hero has to do with gendered pronouns?*'

Relatively little. That's, in part, why I choose to use both masculine and feminine pronouns. I wanted as many people as possible to be able to see themselves in this character... and, well, at the same time and somewhat paradoxically, I wanted to challenge the readers ability to hold a static image of Hero in their mind as they read.

'Anything in particular about Joseph Campbell, mythology and gender?'

Yes, actually. I find his work fascinating, and *this* Hero's journey was heavily influenced by *The Hero with a Thousand Faces*¹⁵⁰ and *The Power of Myth*¹⁵¹ interviews he did with Bill Moyers... However, the one place I found myself continually disagreeing with Campbell was that the hero was nearly always male, and when the female appeared it was mostly either in supporting or hostile roles... It's unclear to me to what degree this centering of the man comes from Campbell himself, or if it's just an accurate representation of his source material. Both actually make sense to me, but that's another essay.

The point here is that I Consumed a lot of Campbell's work, decomposed it in my own, and produced something new that was very intentional about trying to weave together the masculine and feminine into one story—without giving power to one over the other. I would argue that just as the foundation of our bodies is a genetic double helix composed of both maternal and paternal lineages, the foundation of our societies is a mimetic double helix like structure composed of both masculine and feminine cultural lineages.

Let's dance.

¹⁵⁰ Joseph Campbell (1949) *The Hero With a Thousand Faces*. Book.

¹⁵¹ Joseph Campbell and Bill D. Moyers (1988) *Joseph Campbell and the power of myth* with Bill Moyers. Television.

On Mushrooms

A keen reader might notice a rather conspicuous absence of the fungal kingdom in a narrative that is ostensibly about the decomposers. All I can I say: *Mushrooms are the missing day*. Originally, there was an entire day dedicated to exploring the wonders of fungi... but somewhere along the way I cut it. Not for lack of interesting material, but quite the opposite: I didn't have the time to do it justice. The field of mycology, much like the microbiome, has spawned across a wide range of fields...mushrooms are popping up everywhere!

There's a scene near the beginning where Hero awakes from a deep history dream with a sensation as if she 'had terra bytes of vision downloaded directly into her consciousness.' My intention was to employ some creative license by imagining Hero was 400 miles SE and making a plot point for the mushroom day the discovery that she had been sleeping on top of the largest known organism on earth; an 'Armillaria' or 'Honey Fungus' that has been living in Malheur National Forest for an estimated 8000yrs, occupying about 3.5 square miles..

On the evolutionary tree we are more closely related to fungal kingdom than that of plants, bacteria or archaea... and what's more, in *Food of the Gods*, Terrence McKenna makes the case that our ancestors eating lots of psilocybin containing mushrooms was a significant contributing to the unusually fast (by evolutionary standards) growth of the human brain.¹⁵²

In *The Sacred Mushroom and the Cross* John M. Allegro, suggests that early Christianity has deep roots Pegan shamanic rituals involving psychedelic mushrooms.¹⁵³ I, along with quite a few others, find the most interesting parallels to be between the celebrations of Christmas and the Amanita muscaria, which is today still perhaps the most iconic mushroom with its bright red cap speckled with white spots. It emerges in early winter under the bows of pine and birch trees and is toxic to humans until dried out—traditionally done by hanging on the mantel over a fireplace. Once dried, Amanita Muscaria are *Alice in wonderland* level hallucinogens.

Paul Stamets (in my opinion, is one of the world's most interesting people) makes the argument in *Mycelium Running* that "mushrooms are nature's internet" pointing out not just the similarity in physical patterns of growth, but the active sense-response mechanisms that carry data, nutrients, and minerals across significant distances to the places where such things are useful.¹⁵⁴ In other words, mycelium do not just decompose material enzymatically in place, but can actually transport such materials in bioavailable forms delivering them within reach of the plant roots. And more often than not, these roots are actually home to mycorrhizae fungi which live symbiotically—actively feeding each other—on their host plant.

Myco-remediation is another emerging field of study that cultivates specific fungi as a means of cleaning up toxic pollution... myco-pesticides offer promise as safer alternatives chemical pesticides, and myco-forestry could drastically improve our reforestation and afforestation efforts... and all this without even touching connections between mycology and human health.

So I will leave you with this advice, Mycelium is a rabbit hole well worth diving into.

¹⁵² Terence McKenna (1993) *Food of the Gods: The Search for the Original Tree of Knowledge A Radical History of Plants, Drugs, and Human Evolution*. Bantam. New York, NY.

¹⁵³ John M. Allegro (1970) *The Sacred Mushroom and the Cross: A Study of the Nature and Origins of Christianity Within the Fertility Cults of the Ancient Near East*.

This book was highly criticized at the time of its publication for making such claims as 'Jesus never existed as a historical figure but was a mythical representation of psychedelic experiences' and 'the Eucharist is meant to be psychedelic' which are understandably offensive to many and not claims I would make...But I do find the overlap between Amanita Muscaria and the aesthetics and mythology of Santa Claus vary hard to dismiss.

¹⁵⁴ Paul Stamets (2005) *Mycelium Running: How Mushrooms Can help Save the World*. Ten Speed Press. Berkeley, CA. p.2-12

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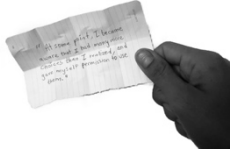


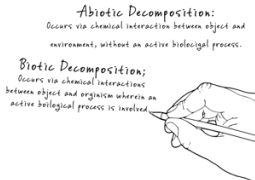
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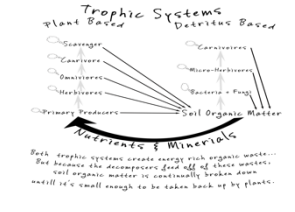



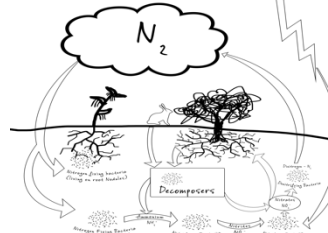
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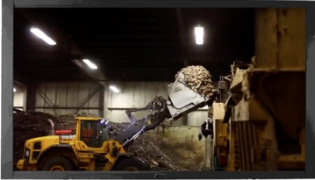




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Illustration Key







Unless otherwise noted, all images and visual components thereof, were made by the author (Jesse Dotson) using Photoshop. All base photographs were taken using an Iphone 7.




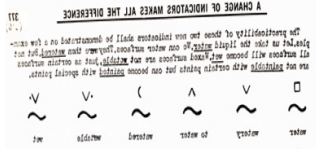
Page #	Image Thumbnail	Title	Inspired by	Direct Source:
29		Community garden sign.	The various community gardens I've had the pleasure of visiting.	Earth globe image sourced from website: https://pngpart.com/png/globe-vector-9.html Attribution: https://pngpart.com
50		More choices quote.		Charles Bates (1991) <i>Pigs Eats Wolves; Going Into Partnership With Your Dark Side</i> . Yes International Press. St. Paul, MN. P.51 The hand in the image belong to Gloria Hernandez.
52		Chemicals Recycle.	Mark B Bush (2003). <i>Ecology of a changing planet 3rd ed.</i> Prentice-Hall inc. New jersey. P.67	Hand drawing, sourced from— https://pixabay.com/vectors/drawing-hand-human-line-art-4067546/ Earth sourced from: https://dlpng.com/png/3953547
52		Energy Flow Through Earth.	Mark B Bush (2003). <i>Ecology of a changing planet 3rd ed.</i> Prentice-Hall inc. New jersey. P.67	Earth sourced from: https://dlpng.com/png/3953547
53		Abiotic & biotic decomposition.	Reading multiple sources and writing definition in my own words.	Hand drawing, sourced from— https://pixabay.com/vectors/drawing-hand-human-line-art-4067546/

54	<p>The Decomposers; Fungi, Bacteria, Algae, & Detritivores. The organisms that sustain themselves through consuming organic wastes and in doing so breaking that material down into smaller and smaller components that are eventually reconsumed by plants. Thus completing a cycle in the circle of life.</p> 	Defining the Decomposers	Reading many sources, writing a definition in my own words.	Hand drawing, sourced from— https://pixabay.com/vectors/drawing-hand-human-line-art-4067546/
55		Redrawing Trophic Dynamics	After consulting many sources, drawing diagram and writing in my own words.	
56	<p>Trophic Systems Plant Based Detritus Based</p>  <p>Each trophic system creates energy rich organic waste... But because the decomposers feed off these wastes... all organic matter is continually broken down... until it's small enough to be taken back up by plants.</p>	Plant based vs detritus based trophic systems.	Largely informed by diagram in text book	Chapin, Matson and Vitousek.(2011) <i>Principals of Terrestrial Ecology</i> , 3 rd ed. Springer. 2011. P. 317
57		Trophic Triangle.	Trophic levels being formatted in a manner similar to the recycling symbol.	
58	 <p>...And how many more?</p>	Seed of life — nutrient cycles	Inspired by combining the seed of life and the various nutrient cycles.	
60	<p>The Carbon Cycle!</p> 	"the carbon cycle"	Consulting multiple sources, drawing from memory, descriptions in my own words.	
63		"The Nitrogen cycle."	Consulting multiple sources, drawing from memory, descriptions in my own words.	Same as above: I could find sources...

68		"Recovery in the whole sense of this world"	The triangle in a circle symbol from the AA, broadened to the whole world.	I made this image for the first in 2015 as part of a school assignment... it was the cover of the for a project where I rewrote the 12 steps of recovery in an ecological context.
84		"Composting tour: tipping floor"	My experience touring Silver Springs Organics in Yelm, WA... And, watching many a tour video of various composting facilities.	Screenshot from: "Tour Hamilton's Central Composting Facility – Educational" which is posted on the City of Hamilton's official YouTube page in 2017. Ontario, Canada.
84		"Composting tour: front loader"	My experience touring Silver Springs Organics in Yelm, WA... And, watching many a tour video of various composting facilities.	Screenshot from: "Tour Hamilton's Central Composting Facility – Educational" which is posted on the City of Hamilton's official YouTube page in 2017. Ontario, Canada.
85		"Composting tour: The shredder"	My experience touring Silver Springs Organics in Yelm, WA... And, watching many a tour video of various composting facilities.	Screenshot from: "Tour Hamilton's Central Composting Facility – Educational" which is posted on the City of Hamilton's official YouTube page in 2017. Ontario, Canada.
86		"Composting tour: Magnetic Removal"	My experience touring Silver Springs Organics in Yelm, WA... And, watching many a tour video of various composting facilities.	Screenshot from: "Tour Hamilton's Central Composting Facility – Educational" which is posted on the City of Hamilton's official YouTube page in 2017. Ontario, Canada.
87		"Composting tour: Conveyer belt"	My experience touring Silver Springs Organics in Yelm, WA... And, watching many a tour video of various composting facilities.	Screenshot from: "Tour Hamilton's Central Composting Facility – Educational" which is posted on the City of Hamilton's official YouTube page in 2017. Ontario, Canada.
99		"Windrow turner"	Some version of this Machine is in use at many composting facilities:	the model in this image is a KompTech Topturn X4500. Image Sourced from: https://komptechamericas.com/product/topturn-x4500-windrow-turner/ Also, an image of Me, taken by gloria Hernandez, 2020.

99		Final Compost screening.	Some version of this Machine is in use at nearly all composting facilities:	This particular depicts a “Powerscreen Chieftain 1400” The image was sourced from: https://powerscreencanada.com/screeners/chieftain-series/chieftain-1400/
112		“Fossil fuels: Extra-Extra Vintage”	The idea that wine gains value with age, and well, so do fossil fuels... just a lot longer.	
116		“Biochemical Properties of a banana”		Photo taken with my left hand of my hand holding my phone. Aurore, Parfait, and Fahrasmane. (2009). “Bananas, raw materials for making processed food products.” Trends in Food Science & Technology. Vol 20 p.82 “Table 3. Chemical composition and biochemical features of banana and plantain at different physiological stages, and after transformation, per 100 g of fresh weight”
117		“What’s floating around at the grocery store?”		Photo taken by me in a Grocery outlet, and then overlaid with basic Bacteria shapes in photo shop.
181		“Magnifying glass inscription”		Photo of my hand holding a magnifying glass holding a T.S Elliot quote photoshopped onto it. Quote from: T.S. Eliott (1943) “The Little Gidding” Four Quartets. Harcourt.
182		“Magnifying glass: feathers”		Image taken by Jesse Dotson, through a 40x magnifying glass

182		"Magnifying glass: Conifer buds"		Image taken by Jesse Dotson, through a 40x magnifying glass
183		"Magnifying Glass: Composite #1"		Images taken by Jesse Dotson, over the course of writing this thesis, with an iPhone, often through either a 20x 40x, 60x magnifying glass
184		"Magnifying Glass: Composite #2"		Images taken by Jesse Dotson, over the course of writing this thesis, with an iPhone, often through either a 20x 40x, 60x magnifying glass
185		"Magnifying Glass: Composite #3"		Images taken by Jesse Dotson, over the course of writing this thesis, with an iPhone, often through either a 20x 40x, 60x magnifying glass
186		"Magnifying Glass: Composite #4"		Images taken by Jesse Dotson, over the course of writing this thesis, with an iPhone, often through either a 20x 40x, 60x magnifying glass
187		"Magnifying Glass: Composite #5"		Images taken by Jesse Dotson, over the course of writing this thesis, with an iPhone, often through either a 20x 40x, 60x magnifying glass

188		“Magnifying Glass: Isopod with babies”		Isopod image sourced from: https://c2.staticflickr.com/4/3470/3726687288_ff7c83ef82_b.jpg
189		“Magnifying Glass: Branch to the head”		Images taken by Jesse Dotson, over the course of writing this thesis, with an iPhone through either a 20x magnifying glass.
207		Recover Shirt		An image of me holing up one of my Recovery in the whole sense of this world Tee shirts. Photo: photo by Gloria Hernandez.
210		Blissymbolics Example Page.		C.K. Bliss (1965) Semantography: A Logical Writing For An Illogical World. Semantography (Blissymbolics) Publications. Book. p.377