

II.

The Elephant in the Room



Imagine that you are in a dark room, feeling about with your hands. There is something in the room with you, and you can feel it, but only in bits and pieces. You are reminded of the blind mice in the fable of the elephant—one of the mice feels the elephant's tail and thinks she is a rope, and another feels her trunk and believes she is a snake. The third mouse feels her legs and argues that she is a great mountain while the fourth feels the leaves of a palm tree in her ears. They cannot agree on what she is.

Imagine making a map with your fingertips.

This thing in the room is genocide and extinction. She is a pulsating, insatiable body sucking in more peoples and more species—growing fat on information. She is growing fat on all of the words in thousands of lost languages. There is no one left to tell you of those words and what they meant. Outside of this room, there was a whole world that only those words could paint, and it is gone—extirpated to this dark and silent room. She has grown fat on all the accumulated evolutionary experience of the auk and the passenger pigeon. Not one of them is left to pass on the secret knowing encoded in their DNA and nowhere else. This thing in the room knows. She is getting bigger.

The elephant is not in the room yet, actually. There are still elephants outside under the sun and browsing the forests. Extinction has not tasted her yet, but she may—and soon. What will happen then to all that information that the elephant knows? What will happen to the story of the elephant? I think I may be able to tell you. I have been in this room too, and I have run my fingertips all over this thing many times, reading her like the mice in the fable. I have a picture in my mind now; I believe that I know what she is.

She is information.

Possibilities

Everything exists in the present moment as an arrangement of matter, and that matter could be arranged in many other different ways. The arrangement in the present moment is just one possible arrangement from a set of possibilities.

Imagine an elephant for a moment, but this time imagine that we are not blind mice, and that our knowledge is not limited only to the tail or the trunk of the elephant. Imagine that we know everything there is to know about her,

right down to the very last atom. There are this many atoms of carbon, so many of oxygen, and we know all of the arrangements of these atoms, how they are connected to each other, and their relative placement in the elephant. Imagine that we have all of the information that there is about the elephant.

Of course the configuration of matter in the elephant is always changing. The elephant is breathing; her blood is pumping; maybe she's gestating another elephant. The matter in the elephant is perpetually being rearranged, and each moment she is a new set of atoms. If we have perfect knowledge of every atom in her body at one very specific moment in time, this knowledge defines only one instant, and there is a very large set of other arrangements that would define the elephant at other times. There is a whole set of possible arrangements of matter that may define the elephant, and the elephant inhabits many of these possibilities, shifting between them from moment to moment to moment. This set of possibilities is called a *story*.

A *story* is a set of possible configurations that a system may take; only one of those configurations may exist in the present moment.

If we were to *completely* describe the elephant, we would need to describe not only the placement of every atom in the present moment, but also the extent of all possible arrangements of matter that the elephant may inhabit as she moves throughout her story. Every configuration of matter that the elephant inhabits is one instance of a set of possibilities.

Order

Every arrangement of matter contains information about how that matter is arranged. That information is the same as order.

If we were to randomly scramble all of the atoms in an elephant again and again, we would not ever see an elephant. This highly structured arrangement of matter is highly improbable and only achieved because the elephant—by whatever means—has the information that is necessary to create an elephant. She can arrange this matter into an elephant very reliably without ever getting a monkey instead (with some left over). This information that organizes the matter in the elephant is one form of order.

Order Again

There are two kinds of order: One kind of order (just discussed) exists in the present moment as an organized arrangement of matter that is otherwise improbable. The second kind of order exists in the set of other possible arrangements—that set may be either very large and varied, or it may be reduced and homogenous. A restricted, well-ordered set of possibilities is not the same as a highly organized and structured member of that set existing in the present moment. These two types of order are not the same; one is order in the instance, and the other is order in the set.

It is easiest to grasp this second form of order if we consider the ecosystem and the elephant in relationship. Let us say that our elephant is living in the Serengeti. Just as we have said that the elephant is an arrangement of atoms, we could define an ecosystem as an arrangement of species. For a frozen instant in time, imagine an omniscient description of every organism present in the Serengeti and their relative position to each other. This would completely describe the ecosystem as we have defined it. Just as with the

elephant, the Serengeti has a story; there is a set of possible arrangements that the ecosystem inhabits, shifting from one arrangement of species to another, and another. The Serengeti is a very complex ecosystem, so it manifests a very high degree of order in the present moment. If we scrambled all the species in the Serengeti into a random arrangement, we wouldn't get the Serengeti. There would be ecological collapse. It wouldn't work for the gut bacteria in an elephant to be scrambled up with soil mycorrhiza in the branches of an acacia tree at the bottom of a lake. Not without most of everything dying. Whatever came out at the end of all that couldn't be called the Serengeti.

So the Serengeti and the elephant are both manifestations of the first form of order we discussed: order in the instance. That form of order is a highly structured, nonrandom, and improbable arrangement of things in the present moment. The second form of order we must consider is located in the set of possible arrangements for the Serengeti. It is an ordering of the story.

If the elephant becomes extinct, the set of possibilities for the Serengeti will become smaller, because every possible arrangement of species that includes elephants will be eliminated. There will no longer be elephants in the story of

the Serengeti. Reducing the story in this way is a form of order. In fact, reducing the possible states of a system in this way is how order will be defined if you look it up in a physics textbook. You will not see two kinds of order in that book; merely a fudging of two separate things into one. It isn't good science to do that. It leads to extinction and genocide.

Sometimes it is helpful to consider extremes. In a GMO cornfield, most of the large organisms are engineered corn plants that are genetically identical. If we were to randomly shuffle the organisms in this ecosystem, things might not look so different. We could shuffle these plants in many different ways to produce essentially the same result. Certainly, if we compare this cornfield to the Serengeti, the set of possible arrangements of species is relatively small. In this respect, the GMO cornfield is a very ordered ecosystem, but it is not ordered in the same way as the Serengeti. The order is not in the present moment; it is not embodied in an improbable arrangement of species or matter. This form of order is in the set; the order is in the story.

	Instance (present moment)	Set (story)
GMO cornfield	Highly redundant and simple; requires little information to describe	Reduced number of possible arrangements
Serengeti	Highly structured; requires a lot of information to describe.	Large number of possible arrangements

Order is here

Order is here

Where is it?

It is not possible to have order or information without something to contain or convey that information.

The first kind of order, in an elephant or in the Serengeti, is clearly contained in their organized physical arrangements of matter, but there is no clear physical phenomenon that can be said to contain the second type of order. An elephant is a form of order, but if the elephant becomes extinct the Serengeti becomes more ordered in its story, and less ordered in its actual being. This order in the story is a real thing, by which I mean that it is a mathemati-

cally quantifiable phenomenon. Isn't that what we mean by real? Where is it then?

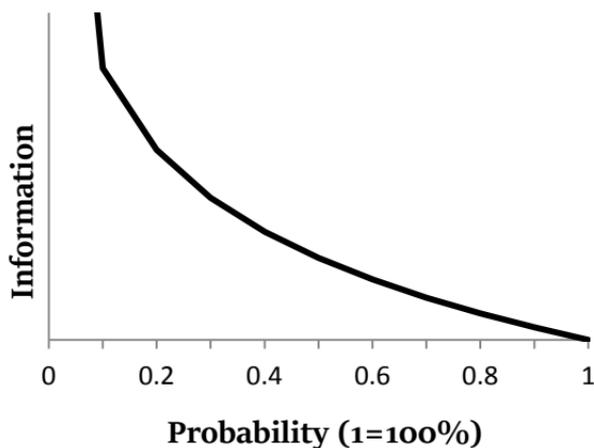
Equations that define the information contained in a set of data were developed by Claude Shannon in 1948. Ecologists also use these equations to quantify the diversity of an ecosystem. These equations use the language of order and entropy (disorder), such that a GMO cornfield is a highly ordered ecosystem with low entropy, and the Serengeti would be much more disordered (higher entropy). These ecologists are measuring the order in the story of the ecosystem.

Every organism carries a quantifiable measure of entropy or information. That quantity of information is a function of the probability of finding that organism in the ecosystem. One interesting thing about these equations is that they are logarithmic, so the information conveyed by an organism increases exponentially as the probability of finding it approaches zero. An extinct organism has zero probability of appearing, so if you saw a passenger pigeon today, she would convey an infinite amount of information. That would be one hell of a passenger pigeon, wouldn't it?

This is something that should make you raise your eyebrows a bit. Most of my work over the past year has resulted from this observation that I made while studying statistical ecology. (It's a hobby.)

This is not a rigorous scientific essay (nobody wants to read

those—not even my wife), but I'd like to point out that information should be carried by something. Here we find that an organism carries increasing information depending upon how close to extinction she is, but no physical characteristic of the elephant changes exponentially as a function of her prevalence in the ecosystem. She is not becoming more massive, nor is her temperature is increasing. What physical property could possibly change in this manner and thereby convey this information? Nothing.



Information about an ecosystem conveyed by an organism as a function of the probability of the organism's species appearing in an observation. Note that the information increases infinitely as the probability goes to zero.

I do not believe that any known physical phenomenon can be shown to contain or convey the information in story. This information is called *cybernetic information*, and is generally regarded as an abstract quantity with no concrete, physical embodiment, but I propose that this information exist concretely outside the known physical environment, in what I call the *story environment*. If we would like to understand extinction and genocide, then I propose that we begin with an understanding of story.

I propose that any real, complex, interconnected system such as an organism, a community, an ecology, or a culture has story. Story is real, physical mass that contains all of the information about the possible arrangements of that system. There is both theoretical and experimental evidence for this mass,¹ and I have developed a system of thought based upon this premise outlined in my book, *Quantum Justice*. The core of this system of thought is that our possibilities are shaped by story—for that is what story is—and the stories that we use to rationalize, coordinate, and understand our behavior are massive, physical objects contained in the story environment. We are a part of these objects in a very real way. While the bulk of these ideas will remain outside the scope of this essay, this system of thought is in-

timately linked to the crises of extinction and genocide, because these events are best understood through the lens of story.

If we would seek understanding of this mass extinction event and if we would like to respond to it in a way that is relevant and balanced, then that understanding must come through investigation of story. If we would appropriately respond to our culture of genocide and exploitation, that response will be informed by an honest and unflinching assessment of the stories we belong to.

We are Stories

We are physically integrated into and enveloped by the stories that we use to determine our own possible behaviors.

The mass contained in a story belongs to the entire system that the story represents. Human culture is organized by story. Languages are stories; money is a story; the United States of America is a story. By participating in these stories, we become a part of the set of possibilities that those stories define. We may choose whether we wish to belong to some of these stories or not. I do not have to authenticate

the story of money by participation in that story, nor do I have to identify as a U.S. citizen. I know people who do not do these things in spite of being born into these stories; they have chosen other stories.

All stories are physical matter in the story environment, and when we are part of a story, we are physically embedded in that matter. If the story of the Serengeti includes elephants, those individual elephants are all part of that story; the instance of the elephant in the here and now is an expression of her presence in the story. Even a simple conversation is a story, and all participants in that conversation are embedded in the physical structure of the conversation as a whole in the story environment.

When we apply this mode of thinking to the problems of extinction and genocide, we see that many of the stories that we belong to do not include elephants. They include ivory instead, and those stories will continue to convert elephants into ivory until there are no more elephants. If we use money we are physically part of that story. More generally, the predominant stories that organize civilized human behavior are sufficiently Cartesian that they do not include the possibility of any subjective experience outside a very narrow class of humans. The Cartesian story system errone-

ously reduces the world to a machine, and the world is not a machine—the world is a story. The Cartesian paradigm has been rapidly extending itself at the expense of other stories for the past several hundred years, but this story does not fit into the story environment—it does not lay flat against the other stories that are already there. The Cartesian story is not part of the universe story. The structure and nature of the universe is not mechanical; the Cartesian story is not included in the set of possibilities defined by the universe story. This represents a grave cosmological error on the part of the Cartesian paradigm.

When we view extinction and genocide from this perspective, we are presented with the question as to which stories we wish to belong to, and whether we will continue to perpetuate and participate in stories that do not actually reflect the nature of the universe.

The Cartesian Rift

At the intersection of the Cartesian story with the limitations placed upon it by the universe story, there is a place where the stories do not lay flat against each other. This creates an aberration in the story environment—a raw edge

where the two stories cannot meet—which grows larger as the power and extent of the Cartesian story expands. That aberration acts as a singularity that consumes material in the story environment. Extinction and genocide are an expression of this loss of story at the intersection between the Cartesian paradigm and the universe story.

We are experiencing the Earth's sixth mass extinction event. We are converting complex ecosystems into engineered single species agri-systems, and this moves order from the here-and-now into the story environment. Rather than having a complex and organized expression of present order such as a virgin forest, we have a reduced and ordered set of diminished possibility such as a chicken house and a bunch of two-by-fours. This is happening all over the world, and quickly.

Simultaneously, this is also occurring in the sphere of human culture, where we call it genocide. The process of genocide and the process of extinction are mathematically equivalent. Over the past five hundred years, classical civilizations have assimilated or destroyed an extremely diverse array of cultures, religions, languages, and people that once covered the greater part of the Earth. Genocide has homog-

enized human culture which no longer expresses so much diversity and structure in the present moment, and increasingly expresses the regimented order of reduced possibility. The stories of ecology and the stories of culture are becoming more ordered.

This ordering in the story environment is a loss of possibility and information that is embodied as mass in the story environment. Some phenomenon is tearing away at these stories and consuming their mass. I believe that this phenomenon acts as a singularity created at the intersection between the burgeoning Cartesian story and the universe story. Like a black hole, this singularity pulls in mass from the surrounding story environment and consumes it. This lost mass is lost possibility. It is extinction and genocide. It is this thing in the room that we are refusing to acknowledge or talk about.

I am tired of these old narratives that extinction, climate change, and genocide can be dealt with through rational problem solving. I am tired of half the people pretending that these stories can be swept under the rug if we will only elect Bernie Sanders or a few more woke representatives, and I am tired of the other half pretending that these problems don't exist or aren't theirs to begin with. I am tired of

these lies that science will save us or that we don't need to be saved. It is extremely awkward to tell you that our science is the problem as much as anything else—our science that refuses to lay flat against the world and creates this thing in the room with me. I am tired of people that make fun of flat-earthers and then draw equally flat maps that reduce climate change to so many parts per million of carbon dioxide and that exorcise genocide to a dull blur in a past that doesn't exist. These maps do not fit in this room.

Have you been in this room before? Here in this place where the stories are? This room is the dreamtime beyond the tick-tock-clock. This room is where languages and identities merge into metaphors older than words. This is where stars are born and die again. This thing in the room is the burning up of grinding edges of tectonic plates that forged the sky. In those places where the crinkled edges rise like the Himalayas, she comes and throws down the mountains and softens them again. She is like Kali, the destroyer. She is growing now, fat upon dodo birds, passenger pigeons, and the Arawak people. She will swallow all the stories that do not lay flat here. She will not choke upon Descartes. Not a bit.

I am feeling around now in the dreamtime, looking for a story that fits. I bring those stories back with me, and when I sit by the fire at night with my wife, we try on these other stories. When I sit with my daughter on the floor winnowing seeds to plant in the spring, I try on these other stories. I teach them to her as best I can, and she teaches them to me—these stories in the seeds, in the soil, in the dreamtime. These are the long stories of slow time. We try them on together and see if we can smooth out the edges so they will lay flat. We will not wear those other stories anymore.

¹ Dutch physicist Erik Verlinde offers a new theory of gravity in which cybernetic information would have weight in a gravitational field: Verlinde, Erik P. “Emergent Gravity and the Dark Universe,” in *SciPost Phys.* 2, 016 (2017). arXiv:1611.02269v2 [hep-th] (8, Nov 2016). <https://arxiv.org/abs/1611.02269>.

Japanese physicists, Shoichi Toyabe, Takahiro Sagawa, Masahito Ueda, Eiro Muneyuki, and Masaki Sano have also demonstrated that cybernetic information is interconvertible with energy in the laboratory: Shoichi Toyabe, Takahiro Sagawa, Masahito Ueda, Eiro Muneyuki, and Masaki Sano “Experimental demonstration of information-to-energy conversion and validation of the generalized Jarzynski equality” in *Nature Physics*. Vol 6. Dec 2010