# IV.

# A World Without Because

I heard the bowl break. I peered over the railing of the kitchen and saw it lying there in several pieces, but not all of them were on the ground. One piece sat there on the table, staring at me. Grinning.

I think I knew the bowl would break before it did, but it's been some time now, and these things have been happening to me long enough that I can't keep them all straight in my head. Sometimes I know, and sometimes I don't. This time, I think it was more of a feeling that something else had happened to break the bowl, and so I was trying to figure out what it was.

Of course the bowl didn't slide off the table and strike a rock. (There are plenty of rocks all about the kitchen, because the kitchen is outside.) If that were the case, how could one piece still sit on the table? Perhaps a stone fell on the bowl, but then we can only wonder how the stone comes to be falling from the sky. It could have been a branch, but there weren't any likely culprits lying about. (There weren't any branches later when the window broke out of the car either—although it *was* windy that day.)

Why? Why should this bowl spontaneously fracture?

I learned later that about the same time, in the other kitchen a lady had sliced her hand open while cutting an avocado. She wasn't used to sharp knives, and probably took too many prescription drugs. I found her shortly afterward, lying on the floor being bandaged up by a friend. Maybe that's what broke the bowl. I suggested it later to a friend, and told him I was looking for causes of things. He told me I was very human. He's been around some, that one.

We really do want to know why things happen. *Because.*

I'm on a train now, and my wife's arm is coming out of its socket. Terra is approaching the end of a year-long ceremonial retelling of her own stories. These are the stories she uses to define who she is—they are deeply ingrained in her body, and some of them are a source of pain. Some of the most tenacious stories are held in her back, where she was often struck as a child, curled up in a ball. She is exorcising these stories now—reaching back in time to pull out the old arrows where they pierced her so long ago. The purging of these stories is tearing her body apart.

Of course we didn't know this would happen on the train. We had a sense that something would be hard, be-

cause we read it in the candles and the I-Ching before we left, but we hadn't really figured on a soul-wrenching re-birth while on the way to Phoenix—laid out upon seat cushions stolen from other seats, squashed between the footrest and the wall of the train. At least we got the seats at the front of the row by the stairs. There's a little more legroom there.

At some point the train stopped due to engine trouble. We sat in San Antonio, Texas for several hours, and the lights were off. The other passengers began to get restless, and one of them confronted me when I got up to get some water. I hadn't spoken with her before, but I'd heard her side of a phone conversation with her grandson. He's doing good in school, and she cautioned him sternly to stay away from girls.

"Do you know why we're stopped?" she asked.

"No."

"We've been stopped for hours."

"Ok. Maybe you should ask someone who works here."

"There's no one here! They've left us alone on the train!" She acts like we're in the middle of the desert.

"Maybe look outside. I think we're at a station."

A little while later, a second passenger confronts me in the same way. This one's a man with a fur coat. I'm not sure why I look like someone who should know why the train is stopped.

"Why haven't they given us any information over the intercom?"

"Maybe because it's 2am and everyone's asleep?"

"Something's wrong."

Meanwhile, Terra is lying on the floor more grateful than not for the stillness as every movement pulses searing pain through her shoulder. I go to sleep.

When I awaken, we are moving again but slowly as the train limps toward El Paso, where the conductor tells us they will change engines. Hopefully they will not overheat again and have to stop before we get there.

The situation is worsening for the disgruntled passengers in our car. Apparently, one of them experienced enough anxiety about the situation to provoke an asthma attack, and a small contingent has formed around a plot to sue Amtrak for their negligence in leaving us all to die in San Antonio. "Something terrible could have happened."

The juxtaposition of Terra's pain and their conversations is comical, and Terra takes it as a lesson to lighten up and explore the power of laughter in healing. The group concludes their planning by exchanging Facebook messages so they can coordinate later actions. They say that they are "freedom riders" and "revolutionaries." I'm not making this up. These people believe that injustice is when your train is five hours late on a forty hour ride. One of them is on the phone with her lawyer. I am reading a biography of Harriet Tubman, and I leave it on the tray table at my seat when I go to lunch. I'm trying to be subtle.

The train breaks down again, and there is a certain eeriness to the whole experience; we are conscious of the metaphor drawn between Terra's breaking body and the wounded train. But of course that's just a symbolic leap. There could be no causal relation there. Once we get to El Paso, the train stops for a while as they change out the engine, and my daughter is reassuring me, "Mommy's not going to die. She's still young." She's saying it over and over. "Mommy's not going to die."

"No," I tell her, "Mommy's going to be just fine. It's just her shoulder." Of course it's not just her shoulder, but she's not going to die either. I'm not sure how to explain any of

this to our daughter, because I don't know what's going on myself. Terra probably doesn't even know. Suddenly, the lights go out, and the hum and drone of the air conditioning stops.

Zinnia says again on the now too-quiet train, "Mommy's going to be ok. She's not going to die."

I hear one of the Freedom Riders in the back whispering, "What's wrong with that lady?"

"I don't know. She doesn't look so good." Another responds.

"It kind of makes you think. We're back here freaking out about this train, and that little girl's mom might be dying."

"I think we were meant to hear that. She said it just when the lights went off, and it was so quiet."

"I think so too."

What do you think?

The alignment of all of these events is certainly very random. The other passengers' personalities were combined in just such a way as to amplify one another's outrage and frustration such that the lateness of the train became a story

of injustice and revolution. The engine could have broken down on any other train or any other day. That engine could have gone with the train to Chicago. Nonetheless, this arrangement of events seems tailored in a way that is almost surreal (if you accept the prevailing expectations of reality) in that we may find a rich symbolism in the interaction between the breaking down of Terra's body, the train, the conversations of the other passengers, and their overhearing of our own conversations. This sort of thing happens to me rather a lot.

Why is it that presumably mechanical or random interactions frequently seem to align just so? *Because.*

I have come to believe that our maps of reality are not accurate. We have been taught to interact with the world as an inanimate and largely mechanical clockwork, and that any random events or synchronicities are just that—random. However, I believe that our notion of randomness and what random interactions mean entirely misses the mark. Randomness in our mechanical worldview is essentially synonymous with meaningless. We believe that we can fully understand the world, and that anything outside our understanding—the breaking of a bowl, the failure of a train en-

gine—is just a random occurrence that has no bearing on our otherwise perfect understanding. We believe that random events are just noise that we should filter out so that we can pay attention to the important things—the things we understand.

I propose that this is exactly the opposite of what we should be doing if we want to pursue a greater understanding of the world and some measure of relevance in our interactions with it. I have come to interpret random events as messages, and I believe that the most useful way to navigate my relationships is to place most of my attention and focus upon random events. This approach is part of a larger system of thought that assumes the presence of a subjective mind in every complex system. I will shortly offer a concrete mathematical proof that this is the most appropriate way to approach complexity.

Anything real, whether that is a flower, a train system, or a human being, consists of many interacting pieces. Chains of cause and effect propagate throughout these systems amidst vastly interconnected feedback networks in such a way that it is not possible to reduce these systems to the mechanical clockworks that we believe them to be. The

entire network can only be considered in aggregate, but not as a mechanical system that can be objectively understood. All of the connections in a flower are best understood as a mind. She does what she wants to. All of the connections in the global economy are best understood as a mind. (A diseased one). I find any other approach hard to support in view of either my direct experience with the world, or my theoretical understanding of how physical systems are composed.

This approach is loosely animistic—and it's worth pointing out that every human society for 99.5% of our history has been animistic—in that we perceive everything to have a mind of its own. (This would be animism as defined by the "attribution of conscious life to objects in and phenomena of nature"—not so much as defined by a belief in the separability of spirit and body). A modern physical understanding of the world supports this animist worldview, but this has been largely overlooked, probably because it disturbs the foundations of thought upon which the modern physical paradigm was originally based. Animistic interaction with the world—in the sense of communication with conscious minds immanent in natural phenomena—opens us up to messages from all sorts of other beings, because we assume

that anything we don't fully understand—which is everything—may be communicating with us. We then perceive that there are messages from another mind in what the rational Cartesian observer would interpret as meaningless random events. This is an entirely different perspective on the world, and although this form of animism has been mostly eliminated from human societies through genocide, I believe that it is actually far more accurate than the objective Cartesian approach. Animism has served humanity for a couple million years, departure from it has led us to global disaster, and we now find that our physical models actually support an animist approach anyway.

The difference between our mechanical paradigm and the animist approach that I am proposing is primarily contained in the word *because*. If we are taught that other beings are machines that may be taken apart in order to discover the inner workings of their molecular biology, then we will perceive their action to be shaped by these mechanisms. We will believe that plants grow toward the sun under the mechanical forces of tropism, there's nothing more to be said about it, and never mind that sometimes they don't. Any departure from normal mechanical behavior is then believed to be random and meaningless. All of the meaning in

the behavior—if any—is contained in the mechanical description of the action. The belief is that this action occurred *because* of these mechanisms.

However, if we consider the subject of our observations to be a subject and not an object, departure from expected behaviors is no longer random and meaningless. In fact, most of the meaning in our observations is now contained in these random departures—exactly in the places where the Cartesian paradigm refuses to find any meaning at all! If we believe that a complex system like a plant is best understood as a mind, then when she does grow away from the sun (which they sometimes do) we might ask ourselves why she does that and what she is trying to say. Our attention is now placed on random events that are outside the reach of our mechanical models, and the belief is that these random events occurred *because* of mind.

So now, when a bowl breaks for no clear reason, or when passengers are combined on a broken down train in a way that feels surreal, I look for meaning. I think there is a mind behind it all, in the connections that link me to the train, to the bowl, to the ceremonies that we now use to navigate our relationships with all these things. I think that this mind is real, and if your rationality is so entrenched as

to balk at the thought of a worldmind, it should also be so forthright and energetic as to examine the following argument in support of the animist paradigm.

It is relatively simple to show that objective cause and effect do not exist in real systems. Objectively observable phenomena do not fully describe causality, so real systems must be considered subjectively. Subjective realities that determine cause and effect are best understood as a subjective mind. Here's why:

Two events may be swapped in time. This is uncommon knowledge because we routinely lie to our children and call it science class. However, according to relativity the order in which events occur depends upon our point of view. Or, two events could be simultaneous according to one perspective but not according to another. This is just how time is made; it's in any decent physics book (although rarely included in basic curriculum). We should teach this to children in school instead of lying about it by omission.

The time-swapping of events raises an interesting question to say the least. If events can be swapped in time, can an effect precede its cause? What would that mean? Fortu-

nately it turns out that it doesn't work that way. My old college textbook addresses this concern about causality:

> "It would be disturbing if some observer, with valid claim on 'reality,' found that cause and effect occurred in the reverse order. But there is no violation of causality....The only events that can have their time order reversed are those that are so far apart in space, and so close in time, that not even light can travel fast enough to be at both events. There is no way that such events can influence each other, and therefore they cannot be causally related. In a very real sense it does not matter which event occurs first, and indeed different observers will disagree on their relative time order." (Wolfson, Pasachoff. *Physics for Scientists and Engineers*. 1995)

This paragraph is really an extraordinary trick. You see, physics is entirely built upon cause and effect, so when the theory of relativity made a train wreck of mechanical physics, the easiest thing to do was to throw out that information because it didn't fit our mechanical maps of the world. This statement in my physics book occurs on page 1008. It deftly ignores the fact that objective causality has indeed been vio-

lated by relativity, and that this completely compromises the vast majority of the preceding 1000 pages.

We can't just point out with relief that an effect can't precede its cause and then act like nothing happened. This is a ridiculous conclusion based upon an absurd reduction of real systems. The argument being made here applies to single events with single causes, but such a thing does not exist except in abstraction. In real life every event is causally linked to many other events, and in real systems it is simple to show that objective causality is indeed violated by swapping the time order of events. In fact, it requires only three events to demonstrate the failure of objective cause and effect. For some odd reason, I've never seen that in a physics book. Maybe because it's "disturbing."

If an event has more than one cause (and of course every event does), the individual causes might not themselves cause each other, so their relative time order can be swapped.

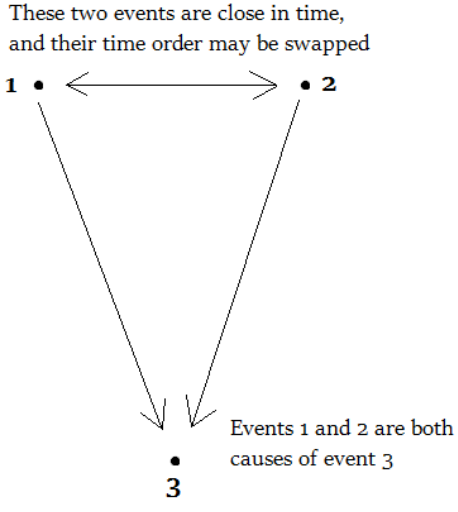


Figure 1: Time order of events 1 and 2 is subjective, but each is causally related to event 3.

In this case, as shown in the above figure, events 1 and 2 are not causally related, but both events cause event 3. There is no way to objectively say whether event 1 happens before or after event 2, because it depends on how you look at it. It's *subjective*. But the order in which things happen matters a lot. If information from event 1 and information from event 2 are both causes of event 3, it matters which piece of information arrives first. The outcome of event

three could be different depending on which piece of information arrives first. But the order that this information arrives is subjective, so—whatever happens at event 3—the cause of this event is subjective. For reference, all of the math for one concrete example of subjective causality is included in the appendix.

This argument shows that we cannot claim that cause and effect is objective, at least not in any system that contains at least three events. In this model of causality, the subjectivity of a system occurs as part the system's interconnections. No single event is subjective, but it is the subjective relationship between event 1 and 2 that produce the subjectivity.

Of course the immediate rational objection to this argument is that the effects of relativity only become important when you're moving near the speed of light—and that would be a very reasonable objection—except that more interactions occur near the speed of light than you might think. On the quantum mechanical level, very high speed is actually a requirement of interaction. If two particles are interacting, then they have to be close to each other. This restriction on the location of the particle requires that it have a high velocity. (This is a result of the Heisenberg indeterminacy princi-

ple, and further explained in the appendix.) We can therefore reasonably presume that, at least on the most reduced level, particle interaction quite often takes place at relativistic speeds—every particle is vibrating and whizzing about at speeds where relativity matters. When we aggregate large numbers of these interactions, we cannot presume that objective chains of cause and effect will be maintained, because the causality in these interactions may be subjective (as shown in figure 1).

Unfortunately, our prevailing quantum mechanical models do not admit this subjectivity. Quantum mechanics is an objective approach where all interactions are aggregated in statistical models, and the behavior of matter is constrained within certain probabilities. But probability is not subjective; there is no accounting for frame of reference or relativity in quantum mechanics. What I am pointing out is that our typical approach is to treat large numbers of quantum mechanical events according to statistical behavior, and that this is different than treating these events as subjective connections. The only meaningful way to relate to large numbers of subjective connections is to treat them as a mind—any real and complex system is best understood as a mind.

Of course when we start bringing in subjectivity and minds, this flies in the face of hundreds of years of scientific thinking—everything since Descartes at least—and there's no wonder that no one's talking about it. But the Earth is a mind; plants are minds; the global economy is a mind.

When we start looking at things on a larger level—like broken bowls and trains—we have to acknowledge that any departure of mechanical systems from their expected behavior has its origin in quantum mechanical behavior of subatomic particles. If a bowl on the table spontaneously breaks apart, the origin of that fracture is in the molecular bonds that bind the bowl together. If I find myself on a broken down train with an oddly arranged collection of other passengers undergoing a complex transition in my relationships with my family and the world, that position originated in the synapses of my brain where decisions were made about which train to take, and when to take it; it originates in the molecules that bind the seals together in the water pump in the engine such that these seals should fail at this or that specific time. Our circumstances in every instant arise from the hardware of the universe, which is inevitably beyond our ken, and which we already understand to be inherently governed by patterns that arise from random events. Our

statistical models of those events on the quantum mechanical level acknowledge their randomness as a fundamental aspect of the universe, but fail to incorporate the subjectivity that is a necessary aspect of these interactions.

In the end, this animist perspective must be extended to the global crisis that is—or should be—the center of our lives. When we ask ourselves what causes cancer, the only answer can be that this disease arises from the subjective experience of the cells in the body. If we would respond to gun violence in America, we must acknowledge that this is a symptom of a collectively violent subjective reality of which we are part. When physics admits subjective modes of inquiry, it becomes allowable to ask, "What does it mean for me to be a part of that mind?"

These issues can't be reduced and separated, because the subjective mind that creates these issues is contained in the connections that are immanent in the whole. We can't attribute extinction and climate change to so many parts per million of carbon dioxide, nor can we single out those responsible for gun violence and lock them up or vote them out. This does not mean that we can't hold people accountable for their actions—we certainly should—and we should be

aware that the nature of this crisis extends beyond the actions of any person. These people are acting out the requirements of a diseased mind—not their own mind necessarily, but the larger mind that human culture has collectively created. Anyone that we remove from office or imprison will simply be replaced.

I believe that this places us in a predicament where the only relevant response is to rework our paradigm and become aware of the other minds around us, whether these be the diseased minds of human production systems, or the collective minds of the ecosystems and organisms that support all life on this planet. We must learn to act upon messages that originate from beings we had previously considered inanimate or nonexistent—plants, ecosystems, soils—instead of acting upon the messages we receive from collective human stories. This will only be possible if we expect to find those messages in the first place. In the end, it is a matter of acknowledging that we are inevitably part of something bigger—that we are physically embedded in a subjective reality that is beyond us—but that we may choose how to interpret the messages we receive from that greater mind, and which parts of it should receive our focus and attention. I believe that our Cartesian attempts to section off

humanity from the rest of this greater whole have driven us collectively insane. Further, I suggest that consciously reacquainting ourselves via an animist perspective with the minds of other beings and with the worldmind is the most expedient remedy to this dysfunction.

# Appendix:

## Causality of Objective Observable Events Depends upon Subjective Interactions—An Example

*Abstract:*

A thought experiment shows that objective observables may be caused by subjective interactions and therefore the causality of such objective observables is not objective. This leads us to consider abandoning objective physical modeling and to consider subjective modeling of physical systems as aggregates of subjective interactions instead of through reduction of objective elements.

Consider three events to be viewed from two inertial reference frames S and S'. The events occur in S at coordinates (x1,t1); (x2,t2); and (x3,t3) respectively, and in S' at (x1',t1'); (x2',t2'); and (x3',t3'). Reference frames S and S' are synchronized such that x1=x1'=0 and t1=t1'=0. S' travels in the +x direction with respect to S at velocity v=0.9c.

We may select event coordinates in S such that events 1 and 2 are not causally related—that is, their time order is

subjective. In frame S, t1 precedes t2, and in S' t2 precedes t1. (t2 is positive, and t2' is negative). However, event 3 is selected such that a causal link is established between both events 1 and 2. The spacetime interval between event 1 and event 3 is short enough for light to travel between the events. Light may also travel between event 2 and event 3. This creates a causal link between 1 and 3 and between 2 and 3 that would not be dependent upon selection of the reference frame.

| Objective causality: | Subjective relationship: |
| --- | --- |
| 1 → 3<br>2 → 3 | 1 ←→ 2 |

It can be shown that for some set of events, the sequence in which information from events 1 and 2 will arrive at x3 is subjective. In frame S, information from (x2,t2) arrives at x3 *before* information from (x1,t1). In frame S', information from (x2',t2') arrives *after* information from (x1',t1').

For example,

$$x_1 = x_1' = 0\ light\ years\ (ly)$$
$$t_1 = t_1' = 0\ years\ (y)$$

We select two other events to occur in S such that,

Event 2 occurs at : Event 3 occurs at :

$$x_2 = 1.5\ ly \qquad x_3 = 2\ ly$$

$$t_2 = 1\ y \qquad t_3 = 2.5\ y$$

Note that light cannot travel from event 1 to event 2, but light can travel to event 3 from either event 1 or event 2.

We may derive the coordinates of these events in S' from the Lorentz transformations such that,

$$x' = \gamma(x - vt)$$
$$t' = \gamma\left(t - \frac{vx}{c^2}\right)$$

where,

$$\gamma = \frac{1}{\sqrt{1 - v^2/c^2}}$$

If S' travels in the +x direction with respect to S and v = 0.9c, this yields,

$$\gamma = 2.29$$

$$x'_2 = 1.38\ ly;\ \ t'_2 = -0.8\ y$$
$$x'_3 = -0.57\ ly;\ t'_3 = 1.6\ y$$

So, in S, event 1 precedes event 2 but in S', event 2 precedes event 1.

**In reference frame S**

Also, in S, information carried by light from event 1 arrives at x3 at

$$t = \frac{x_3}{c} = \ 2y$$

while information from event 2 arrives at x3 at

$$t = t_2 \ + \frac{(x_3 - x_2)}{c} = \ \ 1.5y$$

So, in reference frame S, *information from event 2 arrives at x3 before information from event 1 arrives at x3.*

**In reference frame S'**

However, in S' information from event 1 arrives at $x'_3$ at

$$t' = \left|\frac{x'_3}{c}\right| = \ \ 0.57y$$

while information from event 2 arrives at $x'_3$ at

$$t' = t'_2 \ + \frac{(x'_2 - x'_3)}{c} = \ \ 1.15y$$

So, in reference frame S', *information from event 1 arrives at $x'_3$ before information from event 2 arrives at $x'_3$.*

We can set up an observer at (x3,t3) who will execute an objectively measurable event that varies depending on the order in which the information arrived at x3 from events 1 and 2. So, if information from 1 arrives before information from 2, the observer will execute result A. If information from 2 arrives before information from 1, the observer will execute result B. We are forced to conclude that this objectively observable result A or B would be different in S vs. S'. However, this result cannot possibly depend upon frame of reference if it is objectively observable so the assumptions of causality leading to event 3 must be self-contradicting. That is, it is not possible for either event 1 or event 2 to objectively cause event 3. Rather, it is the subjective reality of the observer at event 3 which causes the objective result. The cause of our objective experimental result (the outcome of event 3) is found to be subjective.

It is important to note that while we calculate these results using a scale of years and light years (for ease in calculation), the model need not be dependent on scale. We could

also take these events to be quantum mechanical interactions between subatomic particles, for we must acknowledge that nearly all of these particles may be moving at or near the speed of light where such relativistic effects cannot be neglected. In fact, the indeterminacy principle *requires* that spatial interaction between particles will increase the velocity of the particle near relativistic speeds, because that interaction constricts the location of the particles involved to the limited region of space where they may interact.

According to the indeterminacy principle, $\delta x \delta p \geq h/2\pi$, The spatial restriction implied by any particle interaction (such as the confinement of a subatomic particle to the space within the nucleus) effectively reduces the magnitude of $\delta x$, and forces $\delta p$ to increase correspondingly. For example, constraint of a neutron to an atomic nucleus requires *minimum* particle speeds of 20% the speed of light. We cannot safely presume that quantum interaction occurs far below the speed of light; relativistic effects will be significant in a large number of interactions.

In this relativistic quantum mechanical model, the subjective interactions that determine the nature of objectively observable experimental results would be too numerous to compute. Also, the indeterminacy principle limits the accu-

racy to which we may measure or predict these subjective interactions anyway. Therefore, objectively measureable experimental results are dependent upon subjective conditions that may only be considered *in aggregate*. This approach is consistent with the statistical modeling that already defines our objective quantum mechanical models, but it is quite different to consider aggregated *subjective* interactions vs. aggregated *objective* interactions.

In an attempt to salvage objective causality, quantum mechanics treats the aggregate interactions as random influences, and uses probability and statistics to model all of these interactions. However, probabilistic models are deterministic and objective, and this form of modeling does not treat the subjectivity of this phenomenon. In a statistical model, the results of any experiment will not depend upon frame of reference. However, we have shown that the objective results of some observations do depend upon frame of reference and may not be considered to be caused by objective chains of cause and effect. They can be shown to be caused by subjective observer realities. It becomes impossible to model that subjective phenomenon through any objective model, statistical or otherwise. It is simply more accurate to model any complex system subjectively.

Subjective modeling of any system, instead of fragmenting and isolating independent elements for observations must aggregate large numbers of subjective interactions, most of which occur on the quantum mechanical level and cannot be directly observed. This form of modeling may best be approached as a subjective 'mind' or whole and animate manifestation of the system under observation. This implies a certain sense of interiority to the system being modeled. For example, in the proposed subjective model it is physically legitimate and mathematically sound to aggregate all of the subjective interactions within a seed and ask, "Does this seed *want* to grow?" Or, alternatively to aggregate the subjective interactions within a living cell and ask, "Does this cell *want* to become cancerous?" The language of subjective interiority in relation to the substructure of the system under consideration is entirely acceptable in a subjective model, for we have shown that objective observables do in fact depend upon such subjective interior interactions in the substructure of any system. In fact, as a useful heuristic, such subjective modeling will likely prove very useful.