

Time Travel, Psychedelics and Physics

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An elf told me — now there's a fine thing for a scientist to say — an elf told me that time travel is possible, but it is constrained in ways which are not normally part of our expectation of time travel. The way in which it's constrained is: once time travel is discovered, you can travel as far into the future as you wish, but you can't travel into the past any further than the moment of the invention of the first time machine. The reason for this is that before the invention of the first time machine, there were no time machines. How can you take a time machine into a domain where there aren't any? You see, it's just to preserve logical consistency.

Audience: That's like saying that you can't drive a car where there hasn't been a car driven before.

That's right. You can't take a car where there are no roads. When cars were first invented, the main objection to them was, "What are you going to do with this thing? It can't go where a horse can go, so what good is it?" So here is a fantasy scenario which for a while I liked very much. It's that quantum physics and nanotechnology and all this malarkey is refined and focused toward the notion of building a time machine, so that on the morning of December 22nd, 2012 at the World Time Institute in the Amazon, the first time journey is about to be taken. The whole world is watching on holographic television as the lady temponaut is strapped into the machinery that will hurl her centuries into the future. There's a countdown and a button is pushed, and off she goes. Now, most people's interest would be to follow this woman wherever she's going, but let's forget her for a moment. The point has been made: she disappears, we assume she went off into the future; but what happens right there, right then?

It seems to me that in the very next millisecond thousands of time machines would begin arriving from the future, simply because they had driven to the end of the road. They had come back in time to witness the first journey into the future. It's as though you could take your Piper Cub and fly it to Kitty

Hawk, North Carolina in 1903 to see the Wright Flyer take off. Now, there is a problem with this which some of you, I'm sure, are thinking of. It's what is called the grandfather paradox, which is the old conundrum that haunts all time travel schemes, which is: if time travel were possible, you could go back in time and kill your own grandfather. Well, then you wouldn't exist, so then this sets up a logical impossibility. Either you exist or you don't exist, and some science fiction authors have assumed that somehow massive influxes of synchronicity would preserve your grandfather. You would approach him with your Saturday night special but it would blow up in your hand, or it would ricochet off the Saint Christopher medal he always wore, or something like that, because he cannot be killed by you, because in that case you wouldn't exist, in which case he couldn't be killed by you.

This troubled me for a long time, what exactly would happen in this situation. According to Hans Moravec of the Robotics Institute of Carnegie Mellon University, time travel is no big deal. The first paragraph of this paper is, "The last few years have been good for time machines. Kip Thorne's renowned General Relativity Group at Cal Tech invented a new quantum gravitational approach to building a time gate. An international collaboration gave a convincing rebuttal of the grandfather paradox arguments. Another respected group suggested time machines that exploit quantum mechanical time uncertainty. The technical requirements for these suggestions exceed our present capabilities but each new approach seems less onerous than the last. There is hope yet that time travel will eventually become possible, even cheap."

So I then saw another possibility, and this is the way we can fulfill the expectation of Christian hermeneutics but not require the Second Coming of Christ or the intercession of God Almighty into history or all these other extreme unlikelihoods. To understand it, we have to have recourse to a physical model in a very simple realm of chemistry and physics, which are the Bernoulli gas laws. Some of you, I'm sure, are familiar with these, and they're very intuitive and easy to understand. We have a cylinder and it contains a vacuum. At one end of the cylinder we have a valve, and the valve is connected to a line, which is connected to a tank of some inert gas, say nitrogen. So we open the valve to let the nitrogen rush into the cylinder that previously was a vacuum. Now what happens inside that cylinder is intuitively obvious to all of us: the pressure equalizes over all points equally. In other words, you can't have fifty pounds of pressure at one end of the cylinder and five pounds of pressure at the other.

We understand that in a gas, pressure distributes itself evenly in order to achieve equilibrium. OK, hold that notion in your mind. Now think of our world in the late 1990s as a sphere or a cylinder of that sort, and think of cultures as gasses at various pressures. Let's assign low pressures to the bare-assed folks in the Amazon and eastern Indonesia and let's assign high pressures to the folks in Manhattan and at Cal Tech, Cambridge, Los Angeles and London. Well, then we can predict, correctly in fact, what is happening sociologically on this planet. What is happening is that the high-tech cultures are totally overwhelming the traditional cultures. The values of Manhattan and Los Angeles are flooding everywhere, and in spite of the tiny lip service we give to shaman-

ism and body painting, the truth of the matter is that Amazon cultures are not really making a major contribution at this point to the evolution of high-tech, global, information-dense, electronic culture. OK, that's the second level of this Bernoulli metaphor. Now let's go back to the situation where we send the lady temponaut off into the future. I'm not familiar with how they overcame the grandfather paradox so we'll pretend that the grandfather paradox is very strong.

So we send the lady temponaut off into the future, but now with what we know about the equalization of high cultures versus low in a temporal medium, what happens from our point of view is that the rest of the history of the universe happens instantly. Even if it's billions of years of human culture and downloading into machines and claiming star system after star system and so forth and so on, somehow the state vector of all those event systems collapses. I call this the God Whistle Principle. It's that we can actually call God into history. We can summon the end state of human evolution to appear a millisecond after we successfully achieve the implementation of this technology of time travel, in order to avoid all the paradoxes that would prevail if there were any extension to the post-time travel era beyond the moment of its inception.

This is a way of, in a sense, forcing the evolution of the universe, and it creates the phase transition of the eschaton. To my mind, it creates the basin of attraction within the domain of our own lives. Now, is there any kind of precedent for something like this, even metaphorically, in our own experience? Well, it turns out yes, there is, in a kind of bizarre anecdote which should sober us considerably as we think about these things. When the first atomic weapon was built by the Manhattan Project in the desert of New Mexico, Fermi and Oppenheimer and all these people got together the night before the test at Trinity and Fermi had a pad on which he had scrawled some equations. He had reached the conclusion in the week before that they were not sure how high the temperature would go when they triggered this device, and Fermi had some back of the envelope calculations which caused him to believe that the nitrogen in the atmosphere of the planet would begin to burn if they tested this thing; they would, in effect, ignite the atmosphere of the planet and the fireball would spread around the entire planet and destroy everything. They spent half the night going over these things and they finally decided that the information necessary to make the decision was not available and so they said, "Hell, throw the switch. At least it will show those Japs and Germans that we mean business!" Of course, the test was carried out, the nitrogen did not burn and instead we were ushered into the glorious era of weapons of mass destruction.

In this article by Frank Tipler called "The Omega Point as Eschaton," by an analysis and interpretation of quantum mechanics Tipler reaches the conclusion that there is an Omega Point and that it represents the funnelling together of what are called "world lines." He, for purposes of mental comfort, sets it far in the future, but in principle there is no reason to do that. Twelve or thirteen years ago, the Swedish cosmologist Hannes Alfvén wrote a wonderful book called *Worlds-Antiworlds*, in which he made the suggestion that the entire universe is

a vacuum fluctuation. *Ex nihilo*, literally out of nothingness. However, there's a caveat, which is that this creation *ex nihilo* can only occur if parity is conserved. What this means is that these particles which come into being out of nothingness must come into existence paired with their antiparticle; so an electron and an antielectron come into being and they divide on separate trajectories and then reconnect and collide with each other, and parity is conserved. In other words, nothing really happened. No laws of physics were violated because they annihilated each other.

For a long time, this was thought to be entirely a theoretical construct, but then it was noticed that the theoretical models of black holes seem to imply that no radiation could leave a black hole, and yet certain kinds of black holes were observed to be giving off hard radiation in the form of X-rays. It was realized that what was happening was that vacuum fluctuations were taking place in the vicinity of the black hole, and because one particle went one way and one the other, the black hole interfered with the conservation of parity. One of the particles was being sucked into the black hole and the other particle was flying off into the ordinary universe and being seen by astronomers as hard radiation. The fact that this process goes on has now been confirmed. Now, an interesting thing about these vacuum fluctuations is that quantum physics places no upper limit on the size of a vacuum fluctuation. What it says is that the smaller the vacuum fluctuation, the fewer particles that are involved, the more likely the vacuum fluctuation is. From observing black holes we can see that very small vacuum fluctuations occur quite frequently.

Alfvén took all this and said, "Well then, is it not possible that our entire universe is simply a very large vacuum fluctuation?" A vacuum fluctuation involving something like 10^{50} particles, and they have poured into the manifold in which we find ourselves, and an antimatter universe, invisible to us because it's in another dimension, was born at the same time; so one universe went off into a higher-dimensional manifold this way and the other one went off in the other direction. What this sets us up for is the possibility, allowed by this interpretation of quantum physics, that the entire universe could disappear instantly, not gradually. You wouldn't see the stars going out, because this is all happening in a hyperspace of some sort which treats this manifold as a point-like entity, so what you would have is just "click" and all particles in the universe would disappear and the original unflawed nothingness would be restored. There's a further caveat to all this, which is that all particles have their antimatter, antiparticle twin, except the photon. The photon is this mysterious particle which is different from all other particles. It either has no antiparticle or somehow it has its own antiparticle embedded within it; so what would happen in the case of a universe which was a vacuum fluctuation which encountered its ghost image and conserved parity and cancelled all particles except photons is that you would suddenly have a universe made of nothing but light. We then have to model the physics of a universe where the only kinds of particles that exist are light.

It's interesting that all these human traditions of transcendentalism make a big deal about light. Light is the metaphor for spirit. The supposition is that

the rarefaction of matter and of the flesh releases us into a realm of light. I am not physicist enough by a long shot to say what the behavior of a universe made of light would be, but I do know enough to say that if you or I were made of light, our subjective experience of the universe would be ruled by relativistic physics. We would have the impression that we could go anywhere instantly and we would have the impression that the universe was aging around us at a tremendous rate. The time dilation of the general theory of relativity says that as you approach the speed of light, time slows down. Now, it's assumed that you can't reach the speed of light, because as you approach the speed of light your mass asymptotically increases, so that to push a single atom to the speed of light would require more energy than there is in the entire universe, because this particle would have become so massive that there isn't enough energy to propel it. But a photon never moves slower than the speed of light; it never moves faster than the speed of light, either. If you were made of photons and you went from here to Zubenelgenubi, a star in our galaxy with a wonderful name, your impression of the travel time would be zero. Again, here is a way without invoking God Almighty where physics seems to lay into our hands metaphors for the anticipation of the eschaton.

Audience: It's fascinating. You're playing with physics. Everything has to be conserved, it's not just parity in the vacuum fluctuation. Matter and antimatter are just one of the dozens of conservations that has to be conserved in these phenomena. They're happening all the time from the point of view of physics — inside our body there are trillions of these virtual reactions occurring all the time — and they can be intercepted. You can have a gamma ray break into a particle and an antiparticle and you can intercept them before they come back together again: that's how they detect them on photographic plates in cloud chambers. But everything you say is right. One thing, I don't think this notion of the big bang — and I'm not sure whether I subscribe to the big bang model — but it sounds so far-fetched because if there were something in the universe then we'd have a real problem explaining how it got here, so the simplest thing to assume is that there's nothing here.

You mean that we are in a vacuum fluctuation?

Audience: No, just that there's nothing here. There was nothing before the big bang and there's nothing after.

This sounds like Buddhism.

Audience: A vacuum fluctuation includes everything: good and evil, male and female, the whole thing added together as a zero, just like it always was.

Well, then what are the complex appearances that impinge upon our senses, and what are we then?

Audience: Because we choose to pay attention to only half of the situation. If we would let ourselves be and experience the whole, then it's all unified.

It cancels.

Audience: It all cancels to zero.

We all assume that there is one past and one future, but it's not clear why we assume that. Think about it for a moment. We're all here gathered in this room, sharing this moment, but we all have different pasts. Not one of us has the past of another, and so what we have in this room is a convergence of pasts, and when this meeting is over we will go our separate ways into a variety of futures. So the assumption that there is one past and one future is just some kind of convenient mental bookkeeping. We are tremendously under the spell of this illusion. We worry about *the* future all the time. Well, notice that you could just move to an island somewhere and get a brown-skinned girl, and then you wouldn't have to worry about anybody else's future because you would have made your own future. We can step out of the assumption of a universal history in which we're trapped. I think that realizing this is the beginning of a kind of liberation. Our assumptions are the edges of our worlds, and this is one of our strongest assumptions: the assumption that there is *a* past and *a* future and our destinies are all caught up in that; but actually you can deconstruct that assumption, and then you're given back a whole different way of looking at the experience of being, which is empowering. Somehow when we are embedded in *the* future, we feel we have no control whatsoever. We're like corks in a raging river; but in fact that's a false model, I think.

Nowhere is it writ large that bipedal apes should be able to understand how the universe works; still less likely is it written anywhere that Terence McKenna should be able to understand how the universe works. The black hole theory of enlightenment is the idea that the real truth can't be told. I'm very aware that all of this is just stuff to support me — to make a living, in other words — that in fact what's really going on defies rational apprehension, I hope! I would hate to think that we could understand what's going on. Nevertheless, there's something to be said of this modeling process. I don't think that the purpose of science is to understand reality. I think that the purpose of science is to advance technology, which is a heresy. I don't think reality can be understood, and that it's absolute hubris for science to cloak itself in the mantle of philosophy. All it's for is to make better toys or, if you're nuts, better weapons. Ultimately there's not going to be any closure in the effort to understand, and I think that the thing you take away from psychedelics, finally, is that all models are provisional, that there is no truth. We talked at one point here about Wittgenstein's phrase, "true enough." True enough to get you to the gas station, true enough to get your taxes paid; but there will be no closure on this stuff. We have to live in the light of the mystery. I think we also said here, it's the death of conversation if we glorify the mystery too much, because then I'll be just like everybody else here and I'll announce that we're now going to have a meditation — which I've

never done to you, I want to point out!

Audience: With that in mind, I wonder how you can project an end to eternity at a certain time?

Well, I didn't mean to imply a nothingness beyond. It isn't like that. I think it's an everythingness. I envision it as boundary dissolution. If all boundaries dissolve then I am you, and you are me, and we are all together. It's exfoliation of the human experience. The small boundaries are man, woman, self, world; and then the big boundaries are life, death, past, future: all of these will be dissolved into something like William Blake's "divine imagination." We will become our grandest dreams, so the whole challenge is to dream a dream worthy of that dimension. It's a very interesting exercise. I don't know if you've ever done it — God, it comes close to being a visualization, I'm sad to notice — but have you ever played the game What Would I Do If I Could Do Anything? First of all, you have to wrap your mind around the concept "anything." What would I do if I could do anything? I used to think about it, and for some reason for me it takes the form of an architectural fantasy. First of all, I just locate myself in the house featured in last month's *Architectural Digest*. Then, from there I begin to work it out.

Well, if you could do anything, within a few minutes of entering into that exercise you're unrecognizable to yourself. You don't even have to exist in a forward-flowing casuistry of three dimensions. You can be a number of species, all possible sexes; you can be translocated at many points in time. You begin to realize that you are tremendously limited by your assumptions. This is sort of what I imagine death is. It's release into the divine imagination, and if you're blown up in an airliner, immediately after dying you're just a dead person, but then you begin to unfold and test the boundaries. As James Joyce says in *Finnegans Wake*, "Up n'ent, prospector, you sprout all your worth and woof your wings," and that's just in the first thirty seconds that you woof your wings. Then you are able to divide your consciousness, to assume any form, to be any place, to know anything. Anything recognizable as human would quickly drop away or would just become a tiny and familiar touchstone that you would occasionally return to. Somehow the dying — which occurs to each one of us — is the microcosm of the planetary and historical process that we are caught up in. It's the thing that we hate most of all. We fear it, we really get agitated when death is raised as an issue. James Joyce called it the grim reaper, a blessing in disguise: "If you want to be phoenixed, come and be parked." Meaning, you have to die to fully exfoliate into this dimension.

Sometimes I think — and I don't often say it to groups because I'm misunderstood and I don't want people to go out of here depressed — that what human history pushes for is the extermination of all life on the planet, for the simple reason that we'll never be free until then. That we are in some kind of hell world and we're locked in a world of matter and energy and space and time and it is not, my God this sounds like the Southern Baptists, but we are living death at this moment and that we must die in order to be born again. In other

words, that somehow what we are has become trapped in a lower-dimensional matrix and our greatest delusion is to cling to this most tenaciously. Jorge Luis Borges, in one of his stories, has this idea that the species, any species, is somehow not completed in eternity until the last member of that species dies. It is interesting that if you think about biology, 95% of all species that have ever lived on this planet are extinct. This is what happens to species, they go extinct; yet we're driven to pursue immortality. It pains us greatly to imagine the death of all life on this planet, and particularly the death of our individual selves or our species, but the fact of the matter is that we don't know what death is.

One of the puzzling things about the DMT trance is that these creatures made of light in the mind that are so different from us, but have such affection and love for us, seem like relatives. They seem like, dare we whisper the word, they seem like ancestors. Yet we would rather believe that they were aliens from Zeta Reticuli or elves in a parallel continuum than apply Occam's razor to the phenomenon and say, "Since we are the only intelligent entities that we have ever contacted in this universe, these things which we contact in our minds in the center of the DMT flash must be human beings of some sort." They don't look like human beings, but they love us so much and understand us so well. Well, is it possible that the kind of human being they are is a dead human being, that we're actually breaking through into an ecology of souls? If we say that the psychedelic experience is an experience of boundary dissolution, and if we say that DMT is the strongest of all psychedelics, then may it not be that it is dissolving the most resistant of all barriers, which is the barrier between the living and the dead, and that what you actually come into is the antechambers of eternity for a brief glimpse? If you were to take that rap and properly translate it into Witoto and go to the Amazon and query those folks, they'd say, "Of course. Your own Mircea Eliade tells you that shamanism depends on the spirit ancestors." For all the credit we give shamanism, we've never actually come to grips with the possibility that shamans really do work with the spirit ancestors, that there really is an ecology of transmaterial human beings in a nearby continuum that can be approached by a boundary-dissolving drug.

It's because we, and certainly I, are obsessed with technological explanations of it and how it's going to be the flying saucers, or the time machine, or the collapse of the quantum vector, but because the forward thrust of our technology is toward immortality: that's what's gnawing at the back of our minds. Yet what may actually be coming toward us, orthogonal to the historical process, is the dissolving of the barrier between the living and the dead which is so unsettling and mind-boggling to us that we'd take a flying saucer invasion any day over having that happen to us. Yet it's very, very late in the game. Human nature is going to have to undergo a radical vertical translation of some sort if we are to avoid the extinction of ourselves and all life on the planet; so then maybe that's what it was for. If we believe that we were always embedded in the machinery of nature — that we could never act outside the purposes of nature — then this must be what it's for.

It's very interesting in embryology, we begin as very fish-like creatures in the

womb and then out of what are essentially little paddle mitts, the human hand appears. I think most people think that the tissue retracts tightly and that the human being emerges, but if you've seen fetal stages in bottles in medical schools, what's actually going on is that cells die off. A massive amount of dying goes on in the womb in order that the human form may emerge out of the fetal form. The webbing between the fingers doesn't retract: those cells die and are released into the amniotic fluid. The growth of the fetus involves the death of millions and millions of cells. We are sculpted into life by the hand of death. I feel as nervous about all this as you must, but this is what we're here for: to stretch the envelope.