

Chapter 5. Loopy Logic

Did all of our discussions about decimals resolve the question of Cantor's diagonal? The answer, of course, is a resounding NO! Even if we talk of diagonals and flipped diagonals forming pairs, we still don't know if the original diagonals are on the list or not. We can assume they are, or allow that they might not be. Again, we only know that both types of diagonal, original and flipped, are made by the same rule with which every number on the list is made -- an infinite string of 0's and 1's organized in some arbitrary, but unstated way. Given localized information about a non-local object, we are left trying to guess a quantum "particle's" state without collapsing its wave function. We can not do this.

Cantor's little diagonal game has played an important role in the history of mathematics. The countability or uncountability of reals is related to the Continuum Hypothesis, a question that bothered mathematicians for centuries, especially since the development of the calculus by Newton and Leibniz. People generally believed that Dedekind put the question to rest with his opaque ideas about "least upper bounds" and "cuts". Actually Goedel later showed that, in spite of Dedekind's clever ideas, whenever you create the postulates for a set of any kind, if you want it to be continuous, whatever you use for your Continuum Postulate is equivalent to the Parallel Postulate in Euclidean Geometry.

For over two thousand years everybody who learned Western geometry believed that Euclid's postulates were just the way it is, a nice ideal model of the real world. Many suspected that the Parallel Postulate was not a postulate, but no one could ever prove it as a theorem. Finally during the 19th century creative thinkers like Gauss, Bolyai, Lobachevsky, Riemann, and Poincare, began shifting in another direction and discovered that you could safely change the parallel postulate and the geometry still worked! Different postulates produced different kinds of geometry. So the Parallel Postulate wasn't right or wrong after all -- it was simply an arbitrary viewpoint. It is one way among many that an Observer may look at a system of geometry.

Eventually not only geometry, but algebra and every other branch of mathematics, became "liberated". Mathematicians discovered that there are infinite ways to design algebras, geometries, logical systems, and so on. Most modern mathematicians have realized that there is no "right" way to do math. Not only is the Parallel Postulate arbitrary, every other postulate is arbitrary. As long as you are reasonably consistent -- and Goedel really got mathematicians to loosen their girdles on this one -- you can create any system you like and play with it and see where it leads you. If it is fun to explore, others will come and join you and play with you. Mathematics has become a totally undefined field of all possibilities open for exploration, just like consciousness in the field of pure awareness. Just set some definitions and start exploring. This means that mathematics has already become Observer Mathematics.

This realization is fairly well established among contemporary mathematicians even though they don't come out and call their discipline OM. Accepting OM is not too difficult a leap of imagination for them because math is inherently an abstract mental

exercise and not an object in the "real" world. We can call it an OM meditation.

However, mathematics is the tool that scientists use for describing the "real" world. Most physicists (and other scientists) are still pretty well stuck in the idea that the "real" world is -- well, really "real". There is a certain way that things are and behave, and "that' s the way it is." We do science to study "how it is" and to describe that "how-ness" to each other.

Cantor' s little trick in his proof used a technique that is very much like the classic paradox of the Cretan liar who warns that all Cretans are liars. A modern version of this is "This statement is false." Whenever you create a liar' s paradox like this, you make a negative mental feedback loop. The self-referral forms a destructive interference pattern that causes the logical system to crash. The whole thing dissolves. Setting up a straw dog and then generating a contradiction to knock it down is a common proof technique in mathematics. But the adventure here is that such methods might at any point call the whole logical system into question.

In a binary logical system we usually imagine that things can be either true or they must be false. Actually, this is not always the case in the "real" world. Mathematicians have evolved "fuzzy" logic and other types of multivalued logic. As quantum mechanics shows, we actually have at least a tetralemma to deal with. Any proposition in a binary logical system may be True (it always gives true results), or it may be False (it always gives false results), or it may be neither True nor False, or both True and False. To clarify what the last two cases are like, consider first the proposition,

* "This statement is False."

This proposition generates a negative feedback loop of destructive interference and becomes undefined and unreal. The statement loses meaning. The belief system short circuits, and we are left with a grammatical sentence in which the words make no sense unless we redefine the words. We call that nonsense.

On the other hand, consider the following proposition.

* "You experience what you believe, even if you don' t believe it,"

This proposition generates a positive feedback loop of constructive interference. If we probe its meaning, we discover something that is undefined but real. This is a statement -- i.e. a belief -- describing a real experience. It is not just a nonsensical sentence, even though it seems to short-circuit your belief system at first glance.

A negative paradox is like falling into a logical black hole. A positive paradox creates a logical white hole -- a logical universe of infinite real possibilities emerges from it.

Let' s explore the example of a logical statement that generates constructive interference that I mentioned above. The first time I became aware of the existence of such

propositions was when I saw a statement by Harry Palmer. Here' s what he wrote.

* "You experience what you believe, unless you believe you won' t, in which case you don' t, which means you did."
(**ReSurfacing**, p. 104).

You see how he built a feedback loop with logical constructive interference that generates a stable condition, just like the quanta of whole number waves for electron orbits.

Palmer says in his Proposition that, if you have a belief, that belief generates a corresponding experience. This idea is a more general restatement of Maharishi' s SCI principle that for every mental state there is a corresponding physical state. Palmer has formulated a more general restatement that includes the notion that experiences may occur in mental space or in any other nonphysical dimension as well as the physical dimension.

Palmer' s Proposition relates to my discussion of the lens/mirror that reflects between mental and physical states. It defines the connection between Mental Space and World Space. If you direct an opinion onto Palmer' s Proposition, you create a self-referral loop. Any opinion you have about Palmer' s Proposition is a belief that you hold. And that belief structures your reality.

Let' s say you try to direct the most destructive opinion you can onto the Proposition:

* "Palmer' s Proposition is false. I don' t believe it."

What happens? If you speak the truth and truly don' t believe Palmer' s Proposition, then you experience that it is not true. But then your experience corresponds to your belief, and the statement still reflects your true experiential reality. That simply provides evidence that Palmer' s Proposition is true.

Thus, whatever you think of Palmer' s Proposition, you must accept it or play a game and pretend to ignore it. In other words, you know it is true, but you lie and say it isn' t, and that it is stupid, and then pretend to ignore it.

That defines your experience as encountering a proposition that reveals something you don' t want to face, so you criticize it and then pretend to ignore it.

Do you see what I mean? "This statement is false" knocks you out. You are left feeling blank, without an answer.

Is it true or not? I don' t know. Is it indeterminate....?

You begin to grow suspicious of logic. Maybe somebody' s lying or playing a trick on you. It' s a language game.

Palmer' s Proposition wakes you up. You realize,

"Oh yes, I guess my beliefs and experiences intimately correspond. They may even be varying degrees of the same thing. But I' m free to believe whatever I want about the statement or anything else, and Harry' s cool, and I' m cool, and so is everyone else, even though we may not agree on our beliefs and/or experiences."

Palmer' s paradoxical sounding conundrum leads to a constructive result, not a meltdown of the whole system. The whole idea that there are various types of paradoxes is something that needs to be studied more. This may be just the tip of the iceberg and something highly relevant for modern chaos theory, fractals, and other iterative systems. Hmm. Logical fractals.

The alternative to the notion that beliefs determine experience leads to an interesting exposure of pretense. People say,

* "That' s preposterous. My beliefs are generated by my experiences. I get my beliefs from God, my parents, my teachers, my boss, my friends, my government, and, by knocking around in the world, I get them from Nature."

All of this is missing the point, since people who react this way have first chosen to believe that they got their beliefs from sources other than themselves. They are playing the game where you disallow yourself as source and decide to let yourself be indoctrinated by the people and environment you have chosen to associate with.

* "I chose to accept the beliefs people offered me so I could experience what it is like to be indoctrinated."

For a serious game player such a meta-belief becomes what Palmer calls "transparent". A transparent belief acts like a glass wall. It limits you, but you don' t recognize its existence because it' s either too obvious, or you forgot about it, or you' re just used to it, or some other excuse.

Every once in a while you bang your head against it. But that' s OK. It' s just a variation of the head-banging game. It' s how things work in the world. From Harry' s viewpoint, all systems are cool, even non-systems. Some just happen to be empowering, and others are disempowering.

Exercise: Do #22, "Belief and Indoctrination" in **ReSurfacing**. Then find a partner to coach you in #23, "Transparent Beliefs".

The goal of theoretical physics is to uncover all the transparent beliefs we have about the nature of our physical world. The Holy Grail for many physicists is to come up with a simple explanation for everything, a unified field, an ultimate formula. But as Palmer points out, the importance of anything is "assigned by the observers and participants." (**ReSurfacing**, p. 64) In another little book by him, **Living Deliberately**, (which you

can download free from the Star' s Edge web site www.AvatarEPC.com) on pp. 89-92 he outlines a little set of "axioms" entitled "Viewpoint and the Nature of Being." At the end he laconically notes that

* "The structure and mechanics of the physical universe may be extrapolated from these ideas."

These four brief pages are definitely worth many careful reads, especially by anyone interested in physics. What he does in those pages is give a simple list of basic definitions of a few key terms with statements of how they relate to each other. These terms include:

* create, define, experience, believe, universe, reality, awareness, consciousness, impression, creation, viewpoint, self, identity, and limit or boundary.

Interestingly, Palmer elects to identify reality with order and unreality with disorder. But I' m sure he would agree that the observer assigns the relative importance of such things.

Imagine the universe dying a heat death. There is just an expanding gas of random particles slowly cooling. Interactions drop toward zero. The jiggles drop toward zero. Time has stopped long ago. Suddenly we become aware that the whole collection of "dead" particles has spontaneously phase locked just by virtue of being together in the same space, like pendulum clocks on a wall. Space/time is relative, and we have no frame to provide a reference point, so the whole shebang may as well be a tiny mote inside the Planck diameter. Uh Oh! We just Gnaab Gibbed!! Wham! Before you realize it, the Big Bang occurs, and we are off on another universe cycle, surfing down from a Poincare Peak into the Sea of Entropy.

Boltzmann fans laugh at the idea of all the air in a room suddenly jumping into the corner. But even a Poincare Recursion in the phase space of the whole universe is not as unlikely as it might seem once we start playing with powerful tools such as non-linearity, observer-assigned frames, and the like. Even though it seems from the current popular viewpoint that the Big Bang after-flash observed by Penzias and Wilson is currently cooled to around 3 Kelvin, the "hot" one is going on everywhere all the time in the virtual space/time of the vacuum state. We just miss it flashing by because that' s not where our attention is tuned.

If you are following the gist of my discussion, then you are there in your imagination, and to some extent that is your experience. It has become your reality to the extent that you believe it. This is one way that realities can tunnel from one person' s consciousness to another' s. Language is a type of phase locking between communicators. That is why I delved a bit into the nature of language and its design features in the first chapter of OP.

In our world humans seem to have the most advanced language system that we know of, but there may be organisms with more advanced features. These could be known or

unknown organisms. The non-local or global phenomena we often see with chaotic and fractal systems may indicate higher order communication features. The same is true of Bohm' s hypothesized "implicate order", a kind of transcendental ESP by which quantum particles can navigate in the field of all possibilities letting entangled or otherwise correlated particles know what' s happening.