

I CHOOSE THEREFORE I AM:  
Quantum Physics and Free Will  
How we make decisions

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[rough draft text; please email me any corrections or improvements to be included in the finished draft [richzubaty@hotmail.com](mailto:richzubaty@hotmail.com)]

How do we make decisions? How do we decide whether to go up the mountain, or down into the valley, looking for food? How do we decide which lipstick is most likely to attract some nerd to buy us a beer? Why do we buy one shirt instead of another? Do we have free will, or are our behaviors predetermined? Or predestined? Or encoded?

I searched high and low, through history and philosophy and psychology and physics, but could find no definitive evidence either confirming or denying the existence of free will. I was stuck. So I tried coming at it from a different angle.

The opposite of free will would seem to be instinct. Pre-programmed behavior. So I went looking for instinct, thinking that if I could just find out where instinct ends, I might find out where free will begins. But I got nowhere because no one knows where instinct is located, or how it works. Birds do not have computers in their brains that tell them to fly south in winter.

However, instinct seems to be a type of memory, albeit an “inherited” memory. So I went looking for memory and couldn’t

find it. But I was in good company. Neither could James Watson, co-discoverer of the DNA double helix, who said understanding memory is the biggest remaining mystery in the biological sciences.

I wasn't done yet. Memory is a property of "mind", so I went looking for mind, and couldn't find that either. Nobody can. We can find our brains, but not our minds.

Mind is an aspect of consciousness, so I went looking for consciousness. Descartes said: "I think therefore I am". A comparable way of saying that is: "I'm conscious, therefore I am." However:

So far attempts to modify quantum physics to include consciousness have failed. [*Taking the Quantum Leap* Fred Wolf; p220]

We know what unconsciousness is. And we know what is going on inside someone's brain when they are thinking about an apple. But we simply cannot find any scientific evidence that a "place of consciousness" exists. [Fred Alan Wolf; *The Spiritual Universe*]

It's been said that the most human thing about us humans is that "we're aware that we're aware". And yet we have no idea what that awareness is, what consciousness is. Where it comes from, or how it works. None. Stuck again. Really stuck. All four wheels.

Philosopher-scientist-mathematician Martin Gardner said we will never understand Free Will, or Consciousness, until we develop a new physics, one that takes us beyond quantum electrodynamics. [*The Night is Large : collected essays, 1938-1995 / Martin Gardner.* by Gardner, Martin, 1914- New York : St. Martin's Press, 1996.]

Newtonian physics was, and still is, fine for making predictions about marbles and balls and even rocket trajectories. But when we tried to apply it to the micro world of atoms and subatomic particles it fell apart. Its predictions were wrong. Then Albert Einstein broke energy down into manageable bits he called *quanta* so he could plug them into equations and analyze the behaviors of photons and electrons, and lo and behold, it worked! It worked well. Science had a new physics math tool.

The problem is, according to Gardner, and me, and lots of other folks, quantum mechanics is too goofy. That doesn't necessarily mean it's wrong. But it's very likely that it is incomplete. Equations that only leave us with probabilities, or that only make sense in eleven dimensions, or that need "someone" as an observer to have a measurable result, probably lack some "unifying principle", according to Gardner.

For instance. It is a principle of quantum physics that events in our universe cannot exist unless they are observed. But "who" was "there" to "observe" the dinosaurs? And if no one was *there*, did dinosaurs exist only as probabilities? And if so, why do we keep finding dinosaur fossils?

This is what happens when one tries to apply minuscule calculations in quantum physics to “real” life situations in the “macro” world. Asking “who was there to observe the dinosaurs” is kinda like asking “what color is time”. It’s a bogus question, cooked up only for the purpose of evaluating it via quantum speculations.

Says Gardner, when it comes to free will, we are asking the wrong question. “Do we have free will or not?” And we won’t know the right question to ask until we have the new physics to guide us. For instance, Newtonian physics caused us to ask, “what is the orbit of an electron?” But in reality electrons inhabit “clouds” not orbits, so we were unable to answer the question. We were asking the wrong question. A bogus question.

How would a caveman ask you to build him a web site? Would he grunt and scratch pictures on his cave wall? How would *you* ask an intergalactic alien to explain teleportation – the “beam me up Scotty” phenom? Would you show him old Star Trek episodes? And how would you be able to understand his answer given the insufficiency of our current science?

So we ask if we have free will or not, and we don’t get a clear answer. But it sure *seems* like we have free will. Our courts throw people in jail because they made the wrong choices. We spend our days deciding what to eat and what to buy and which way to turn the wheel. It seems overwhelmingly clear that there’s much too much data in the universe for its manifestation in physical forms and movements to be predetermined. And anyway, one thing quantum investigations *have* shown, is that at

the quantum level all matter passes through indeterministic states, and therefore *cannot* be predetermined.

At the beginning of the 1900s the game of theoretical science seemed to be over. There were “laws” of science and “laws” of physics and “laws” of chemistry. We seemed to live in an entirely mechanistic universe, which would necessarily have been devoid of free will. But then along came quantum “uncertainty” and blew the battleship of determinism out of the water...thank God. Or thank Werner Heisenberg actually, for describing the Uncertainty Principle.

Just a few years ago scientists were saying the universe would one day slow down and stop and collapse back on itself, and they were wondering whether we would actually live our lives backwards. Would broken milk bottles become whole again? Would we appear out of the ground as old codgers and return to mom’s womb? Really stupid questions. And then it was discovered that the universe is actually expanding faster *now* than when it began, which makes no sense at all within current scientific understanding. But at least it managed to shut up *some* of the stupid questions propagated by bogus presumptions and insufficient scientific measurements.

When I watch the hand-waving speculations put forward by the “many worlds”, multiverse, “bubble universe” proponents I get the same sinking feeling I got from the backward-running universe fantasies. They’re arguing about how many angels can dance on the head of a pin again. They’re asking questions based on inadequate science. And even though I happen to believe in multiple dimensions and other universes I am also a stickler for

adequate science. Until the day comes when we have a basic understanding of consciousness – where it is and how it works – we can be certain we are relying on *inadequate* science and asking too many stupid and unimportant questions. Who was there to observe dinosaurs? Are you gonna crawl back into mom's womb? Sheesh.

So let's take another run at this. Let's at least *try* looking in the right directions. Then maybe we can ask some of the right questions.

When we ask, “what is instinct”, we are not given a clear answer. We do not get a functional description of mental processes at work. All we get is a description of end results. “Baby turtles crawl out of the sand at night and scuttle into the ocean.” They do not hatch during the day and stroll into the bushes. Why? How do they know to do that? What *makes* them do that?

Phlogiston? Preordination? Thymus gland? No. *Instinct*. For some reason the correct answer in this case is “Instinct”. A word that explains nothing. Identifies nothing. Although it sure *seems* to identify something. Look at birds and dogs and babies. They all automatically enact behaviors that were not “learned”. Behaviors that seem, instead, to have been “inherited”, from somewhere, somehow....

And when we ask, “what is memory and where is it located?” we do not get a clear answer. But surely there ARE memories because we all have them.

And when we ask, “what is the mind and where is it located?” we do not get a clear answer. Is the mind part of the brain? It sure seems like it, but we can’t find it. Somehow the physics we employ in looking for the mind is not sufficient to the task. It’s like drilling for oil with a corkscrew. We’re not getting down deep enough, or we’re drilling in the wrong place, or something.

And when we ask the Mother of All these Questions: “What is consciousness and where can we find it?” we get the same answer. No answer. Just some philosophical bloviating by brain-heavy individuals from different eras tossing up metaphors about water wheels or clocks or computers. We don’t know what consciousness is because we don’t have the scientific language to know. And that really pisses me off. Probably because I’m gonna die soon, and I want to know what, if anything, happens next.

I’m a caveman, furious with my lot in this damned life, stomping the dirt, beating on logs, biting the heads off chickens, because I cannot *understand*...Understand what?

Well...Electricity for one thing. I see the lightning. I know it sure as hell isn’t Thor throwing things around up there because Thor isn’t that smart. But what can it be? What’s the cause of it? What **IS** it?

That’s me. That will always be me I guess. Trying to understand electrons and magnets with a caveman’s knowledge of science. But somehow it doesn’t seem completely out of reach for me to *try* asking the right question. Even if I don’t have the science to answer them, maybe someone else *does*. So let’s start ripping

apart the questions I've asked, which might help things out a bit more than biting the heads off chickens.

Is there free will? We don't know.

Are there decisions? Do we make decisions? Yes we do.

Do other creatures make decisions? Yes they do.

Why do we make decisions?

Well, thank goodness, quantum science has answered that one. The universe is not preprogrammed and not deterministic. It changes. All by itself. Erratically, and illogically, following no detectable rules. In quantum jargon: we do not know *why* the probability wave function collapses and produces a single event.

Therefore...behavior predicated on living in a logical and predictable universe...is dangerous. Reenacting the same behaviors over and over again, in a changing environment, can lead to pain, dismemberment and death. Natural selection alters inherited behavior, instinct, over centuries-long time spans. But in the short run nothing really beats decision-making for preserving life.

Now we're getting somewhere.

Decision-making is essential to life.

Quantum indeterminism *necessitates* decision-making.  
Necessitates choice. (Has anyone said this before? Has there

been an article on it in Scientific American? I haven't seen one.) Since the universe is going to behave in weird and unpredictable ways we require consciousness and a freely operating will to navigate the inevitable outbursts of weirdness and chaos. Memory, both inherited (instinct), and learned, can give us a baseline from which to make decisions.

For instance. I am a deer. Every morning I go to graze in a certain field. But today I smell smoke. The smell is strange and unknown. I decide to run away from the field and thereby avoid being burned alive in a forest fire.

Or...I am a rock. I feel a rumbling beneath me and want to run away, but I can't. I am burned alive in a volcano. Yes, correct, the rock cannot run away anyway...but that's point. The rock cannot execute its will. Decision-making only matters when different courses of action can be chosen and executed. Decision-making is not possible without a variable, exercisable will.

It's easy enough to think that the deer had no choice. She had to run away. But anyone who has seen the aftermath of a forest fire knows that some deer get burned alive. Some make the wrong choice. Moreover, when you're lost in the smoke and confusion of a forest fire it is never clear what the **right** choice might be. Some deer run away from the fire, some run toward the fire, some run around in circles, some lay down in creeks, some panic and freeze in place. And some – this is the important part – and some *always* survive. Because different deer make different choices, some *always* survive. The species survives.

So...in order to outmaneuver a universe driven, from its subatomic core, by indeterministic and unpredictable fluctuations, living things, moving things, must be equipped with consciousness, memory, and an executable will, resident within some sort of “mind”, from which to evaluate options and enact decisions. Even amoebas have to decide whether to move up or down according to changing currents or salinity. Sometimes it kills them, sometimes they thrive.

The important thing is not that one human being, or one amoeba, makes a certain choice, which in retrospect seems unavoidable to the point of being predetermined. The important thing is that different humans and different amoebas make *different* choices. The exercise of decision-making is fundamental to life. Even plants must decide whether to grow towards the sun – unless too many cars are swishing past in that direction – in which case, they won’t.

Life requires a free expression of will. It cannot persevere without it.

## COSMIC CONSCIOUSNESS

The fact that a high level of consciousness is associated with complex neural structures does not prove that the neural structures produce this consciousness. – David Bohm

I would love to believe in a Group Mind, a Cosmic Consciousness, a Collective Unconscious, Akashic Fields, or

whatever you wish to label the cosmic library of learning assembled throughout the eons. Unfortunately, we have no more evidence for these than we have for instinct. We observe the results of instinct – inherited, passed-on behavior – but we don't know where it originates. Where it resides.

Is it the same with this Cosmic Consciousness?

Personally, I don't see how an amoeba could remember all it needs to remember, or know all it needs to know, without those instincts (memories) being stored somewhere outside its tiny body. It is required to know about chemical processes and protein synthesis and how to fan its cilia in order to swim. It has to know lots of things human scientists *still* don't know...And remember, you can fit one of these buggers on the point of a pin.

Is it possible there is a repository of consciousness, a world wide web of knowledge, infused throughout space/time, or even infiltrating other dimensions, where anything that has decisions to make gets a free web page and free email and browsing privileges?

And is it possible that our little amoeba is like a laptop computer which, *when turned on*, has wifi access to all this information, and can also post its new discoveries online? That sure would explain the “hundredth monkey” phenomenon – how monkeys on different islands simultaneously learned the same thing. And why human agriculture started on distant parts of the planet at approximately the same time. And lots of other things, like maybe even entangled particles.

Yes, this is stupid. Just as stupid as the caveman trying to reproduce lightning by waving around burning sticks and shouting “BOOM!”, while he sketches a jagged picture of lightning on his cave wall. His science will never work, sorry fool. But he is pointing his mind in the direction of something that really *is* there: electricity.

So lets wave our sticks and shout and point our minds at the idea that perhaps an amoeba’s knowledge base is stored *outside* its body. It knows a lot of things but it has no brain. How about that? So this idea that perhaps it stores information outside its body is not really such a great leap of faith. Nothing like believing a photon can be both a particle and a wave.

And if this is true for amoebas, can it be any less true for ourselves, who are basically made up of a trillion amoebas we call “cells”?

Ervin Lazlo in *Science and the Akashic Field* reports a revealing type of “entanglement” between bodily cells that recalls the entanglement physicists have found between subatomic particles. Two subatomic particles that have “inhabited the same space/time coordinates” thereafter become “entangled” in such a way that no matter how far apart they get, a change in the state of one is almost instantly reflected in the other. If an electron spins left its associated positron spins right, or something like that. The point being that this information moves between the two at greater than the speed of light. According to Einstein, no energy/matter particle can move at greater than the speed of light, therefore we must conclude that this form of information transfer is not typical energy or matter. It’s something else.

Lazlo uses the phrase “Akashic Field”, from the ancient Sanskrit, to describe the “region” in which this information transfer takes place. The point being that bits of energy/matter can be informed across space and time in ways that that defy normal physics, almost as if this information is “imbedded” in some type of field. When one end of the field dips down the other end instantly dips up – or something like that. The Akashic Field is a Knowledge Field or Information Field. (Hang on, while I light another flaming stick and sketch some jagged lines on my cave wall.)

On the cellular level, our level, Lazlo reports an experiment whereby cell scrapings were taken from the mouth of a subject and removed 10 kilometers away. Both the subject *and* his cell scrapings were hooked up to lie detectors. When the subject was shown certain shocking images (crashing planes) his lie detector registered a spike in emotion. And ten kilometers away, *so did his cell scrapings*. At precisely the same time.

Is this bullshit or not? I don’t know. But since we do know that subatomic particles can be “entangled” it’s not a great leap to suppose that formerly joined cells made up of subatomic particles *might* be entangled also.

But let me rope this back in to the previous rant. Physicist David Bohm said that, “deep down the consciousness of mankind is one”. Ancient Hindus had a name for this, they called it *Atman*. The group mind or group soul. The idea being that individual humans would come down to earth and live for a while, and when we die our “souls” – the sum total of our individual

experience – would rejoin *Atman*. In this way *Atman* is the repository of all human knowledge. Or bird knowledge or turtle knowledge as the case may be. This concept offers a peephole into how instinct might operate. And actually might help explain how memory and consciousness work too. Hidden worlds do exist and we need a better, or at least a different, science to develop the tools to explore them.

Time for a caveat.

Though I believe there is much of great value in Lazlo's book, I don't want to make Lazlo's mistake. Every unexplained phenomenon he stumbles across he puts down to the Akashic Field. Why do butterfly wings have scales? Akashic Field. Why are subatomic particles entangled? Akashic Field. Why do babies instinctively suck mom's tit? Akashic Field. This is really just a half-inch away from saying "God did it." Which might be true. Both concepts might be true. But they don't tell us anything. They don't tell us how anything works. We've just stuck another word on an unknown and explained nothing. *How* did God do it? *How* did the Akashic Field do it? That's what interests us. That's something we can drag home and cook on the campfire. Enough already with sketches of mouth-watering beasts drawn on cave walls. I want something I can eat.

And so we have arrived right back at Gardner's observation that our current physics is inadequate. Indeed, what we need is a new physics designed to study "non-physical reality". But how can we investigate phenomena, information transfers, that happen faster than light?

Now we're getting somewhere. At least our questions are getting better.

## UNFREE WILL

We are all cells in the body of humanity – Peace Pilgrim

The life of the individual is only borrowed from that of the species...In reality there is only the species, only life, only will – Arthur Schopenhauer

This book is coming off the keyboard backwards. But there's a reason for that. The reason is, with this topic, unlike most topics, we cannot start out by establishing a few basic facts and build off of them. We cannot establish the basic facts in this case because we don't know what they are. We don't even know what questions to ask. So we have to start with what we do know, and grope our way backwards, into what we do not know. Sketching an outline of an elk in the hopes that we can conjure a real one into our cooking pot.

No, I don't hold out too much hope for this method. But there must have been some reason cavemen did it. It's obvious to me that imagining has something to do with reasoning. Einstein created "thought problems" then reasoned his way out of them. Do grizzly bears dream about blueberries in February? Of course they do. Do they make sketches in the snow of blueberries? Perhaps. But I've never seen a picture of one. However, humans are different. Imagining things, on cave walls or on paper, gives us an edge toward making new discoveries.

How about Amerigo Vespucci. He pulls out a piece of paper and draws an outline of a squashed bug and calls it “America”. 500 years later we slaughter 30 million turkeys every November in commemoration of his mad fantasy. Or something like that. It doesn’t matter. What matters is daring to have the mad fantasy.

Since, so far, we are not getting anywhere understanding free will, let’s apply my dependable old formula and try to understand its opposite. Unfree will. Regular old will.

All of creation is driven by will. The will to be. The will to become. The will to survive. But whose will is it? What will is it? Where does it come from? Is it a free will? Or is it predetermined by someone or something else? Could this force, this “will”, be a fundamental feature of the universe, a universal property, or even a universal constant? Or, to come at it from a different direction, if there was no such thing as “will”, would atoms and galaxies look like they do, and would we even be here to wonder about them? These are all worthy enough questions that there’s some value in finding out whatever we can about this thing called “will”.

Will. We all have it. We can hear it in babies, screaming for what they want. Waking up the whole neighborhood because you took away their clown rattle. How come they act like that? Where did it come from?

It came from a Big Bang. 13.7 billion years ago, out of one single point – possibly exploding out of another dimension – all the matter in our universe was birthed, and began flying apart at less than the speed of light. Leptons and gluons flew in every

direction. I'll hereby label this explosion a "masculine" force. (Muzzle your mustangs. There's a good reason for that.)

Before long, as the explosion slowed and cooled, another force, gravity, which I will label a "feminine force", began pulling some of the loose bits of matter together into clumps. And these clumps became galaxies and stars and planets.

So, in my simplistic model of the universe there are two forces, or "wills", at work. One masculine, explosive, creative will. And one feminine attractive, protective will. And from these two forces, or wills, all things known to us are made. It is the *explosive* linear trajectory of a planet, shooting through space, *pulled* upon by the gravity of a sun, that forms a solar system. And, in an analogous physical realm, it is the proton pulling on the speeding electron that forms an atom.

Masculine and feminine, fundamentally conflicting forces working together. So is our universe made.

Look, this is philosophy. Our problem is terminology. Naming things that have not yet been named. These models are not exact fits. Atoms do not *look* like solar systems. And yet, the forces observable in both – a vectored thrust, "pulled" around a heavy center – are remarkably similar.

Even though this is only a thought-painting, and even though I'm trying to sketch things on the cave walls of your mind that aren't there, it's worth drawing some conclusions from this picture. Masculine and feminine force, or *will*, are not the same. They naturally conflict with each other. But it is precisely from

the conflict of these two wills that our world is formed – from the tiniest atom to the greatest galaxy, and virtually everything in between. Male and female are not intended to “agree” with each other. They were designed to disturb each other, to “yank” on each other, and out of this conflict our world was created. In other words, it’s no wonder that men and women don’t get along so well. That’s not how they were designed. That’s like expecting fish to talk. If they did we would be inhabiting a different physical universe built on different fundamental principles. It’s possible that other universes built upon other kinds of physics exist, but so far we are only able to talk about what happens here. What it was like one second before the Big Bang remains a complete mystery to us. Our world is built of opposing forces. One exploding apart and one pulling together.

When a hunk of minerals is acted upon only by masculine thrust it becomes a cold comet, hurtling through empty space. When this hunk is overly attracted by the feminine force, it is dragged into a star and incinerated. But when it is acted upon equally by both male and female wills, it becomes a planet in orbit. Maybe even a blue planet, with water and moderate temperatures and what we call “life”.

But what is life? Is it merely the interaction of male and female wills? Is it as simple as that? No, it’s not. And yet, given the limitations of language, it’s not a bad metaphor for us to use to launch our investigation into the fundamental characteristics of will.

Let’s try Schopenhauer again:

“The act of the will and movement of the body are the same thing.” [from History of Philosophy by Will Durant; p 314]

This simplifies things somewhat. Gets us back to basics. Will is not a thought. *Will is an action*. Will is not merely desiring something. Will is *going* to get it.

Says Schopenhauer, “The lower you look among life forms, right down through plants, the smaller we find the intellect, but not so with will.” [from History of Philosophy by Will Durant; p 316]

When you look at it this way, the “will of the universe”, and “instinct”, really *are* the same thing.

Says Schopenhauer, “The will is a will to live; and its eternal enemy is death.” [Will Durant p 317]

A living body is conscious. A dead body is not conscious. Be it human or ant. In death the laptop of life shuts down. The connection to the world wide web of stored information is severed. To be conscious is to exert will.

Says Fred Wolf: There is no self without volition. [*The Dreaming Universe*; Fred Alan Wolf; Simons and Shuster; 1994; p 315]

So we have run ourselves in a circle. Will is a kind of instinct, which is a kind of memory, which is stored in a mind, which is a product of consciousness, whose main feature is will. The will to

be. The will to become. Become what? More aware More conscious.

Can it be argued that the purpose of will is to enlarge consciousness?

Yes it can.

Can it be argued that *the will of the universe is to enlarge consciousness?*

Yes it can.

But where does free will break into this loop?

Don't worry. We'll get there. Take a deep breath.

Hindus refer to God as the Supreme Consciousness. Consciousness is something we humans have always associated with a higher level of existence. Rocks may be conscious. But ants and people are *more* conscious. And people are more conscious than ants. More aware that we're aware.

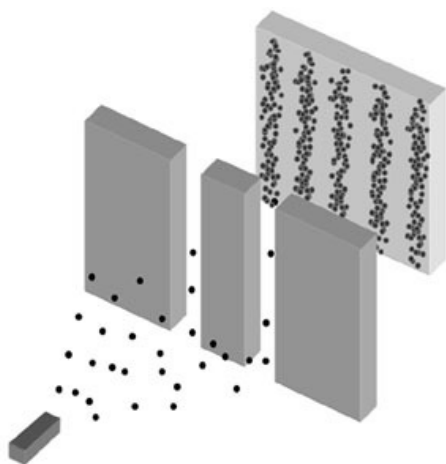
Traditionally, or metaphorically, God is the dispenser of consciousness. He bestows some of it on us, whom he expects to use it, to honor him for his largess, by praying to Him. Thanking him. We are made in the "image" of God in the sense that we have been bestowed a portion of His consciousness. And all He asks is that we acknowledge him for it.

Why?

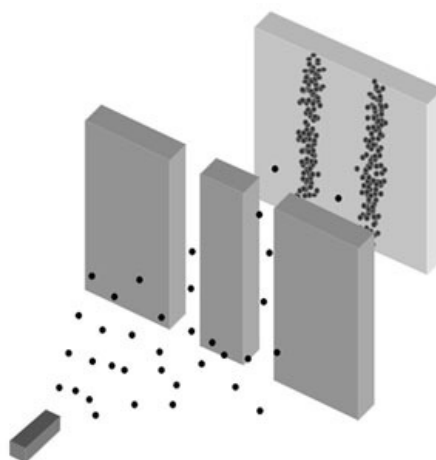
What's the big deal? Why would the Creator of Everything care whether or not a large ant named Rich Zubaty acknowledges him or not? Is He insecure? How could *He* be insecure?

He's not. None of this makes any sense until we step outside of science and entertain the idea that the *purpose* of the universe is to extend consciousness. The *will* of the universe is to *enlarge* consciousness. Science, rightfully, does not concern itself with the *purpose* of anything, but philosophy and religion and cave paintings do.

This is not as dumb as it sounds. If we analyze the famous **two-slit experiment** in quantum physics we find that normally light exists as a wave – an array of probabilities. But if we actually focus our attention on this light, if we try to count it and measure it – if we *observe* it – it mysteriously converts itself into individual particles. Photons of light. If we don't look at the light it's a mere potentiality, but if we actually *do* look at it, it becomes physically *there*.



Photons unobserved



Photons observed

make wave pattern

“become” particles

[Thanks to: SoftwarePhysics for the drawings]

This bears repeating. If we don't focus on it, if we don't observe it, it remains only a probability. A potentiality. But if we *do* focus on it, if we look for it, if we *observe* it, it actually becomes *there*.

So, the fundamental nature of the universe is that to exist it must be observed. And this implies a *choice*. The choice to observe or *not* observe. The choice of the observer to either look, or not look. That's a *very big choice* as it turns out.

The entity that remains unobserved exists as a wave. The entity that is observed becomes a particle. This is the warp and weft of the cloth of the universe.

So...Not only *is* there free choice, but *free choice is the only thing there is in a universe that actually exists*. That's how fundamental free will is. The physical parts of our world cannot exist without it. It's built into the fabric of space/time.

Says Fred Wolf:

...This potential reality is available for our choosing. The experiences we call “reality” depend on how we go about making those choices. *Every act we perform is a choice, even if we are unaware that we have made a choice*. (my italics) Our unawareness of choice at the level of electrons and atoms gives us the illusion of a mechanical reality. In this way we appear to be mere victims subject to the whims of a “higher being”. We appear as victims ruled by a

destiny we did not determine. [*Take the Quantum Leap*; Fred Alan Wolf; Harper and Row; NY; p 141]

Choosing to observe the world changes the world. Very heady stuff. The only current competing theory to the classic wave/particle duality model is the multiverse theory, whereby every choice we make spawns another entire universe where we have made the *opposite* choice. An entire new universe still peopled by Napoleon and Ted Kennedy and Elvis and Obama – but a universe where we decided to get up *now* instead of three minutes from now.

Pretty crazy if you ask me. Probably bad science. But I don't care about the crazy part. I care about the *choice* part. Choice has remained the same. The two current scientific theories of the makeup of physical reality both require *choice*. Either the observer chooses to look or not to look. Or the participant decides whether to roll over for three more minutes or not. Either way:

I choose therefore I am.

## THE GOD PROBLEM

The fundamental nature of our world is this: If we don't focus on it, if we don't observe it, it remains only a probability. A potentiality. But if we *do* focus on it, if we look for it, if we *observe* it, it actually becomes *there*.

A realtime metaphor for this is that a rainbow has no reality apart from its observation. It exists only because you are at a certain time and place, with your eyes open, looking to see it.

Like God.

What?

Like the Supreme Consciousness.

What?

If we ignore the Supreme Consciousness it exists only as a potentiality. But if we actually focus our attention on the Supreme Consciousness, more of it becomes *here*.

That's the explanation for why God cares if a large ant named Rich Zubaty acknowledges Him. Prays to Him. Meditates on Him. If I focus on God, there becomes more "God" in this world. If I focus on the Supreme Consciousness, there becomes more Supreme Consciousness in this world.

*If the purpose of will – if the will of the universe – is to enlarge consciousness, then the obvious method of achieving that is to have ever more observers observing it.*

Maybe the entire purpose for human life is for us to be observers collapsing probability waves and thereby enlarging consciousness.

Don't freak. I'm not a hippy – anymore. This is just more cave painting. I'm intermingling the metaphor of the two-slit experiment, with the metaphor of god, to paint ideas we do not *yet* have the science to talk about.

If we ignore God, He is only potentially present. But if we actually look for him, then he *actually* comes into existence. Just like a photon. The more we look for God, the more of Him there is to be found. Right here in this world.

Same with consciousness. If we ignore consciousness it exists only as a potential. But if we actually *look* for consciousness, more of it becomes “physically” present in our world. And this, now, has become a bona fide cave painting, because the mystery of just how consciousness becomes physical, or the physical becomes conscious, is the mystery we are trying to *grok*.

I know this seems goofy. However it also seems pretty goofy that the earth is *not* flat and that we are actually standing sideways spinning around the sun.

The problem is: science has not yet defined a Quantum Particle of Consciousness the way it has defined a quantum particle of energy. Science has not yet given a quantifiable value to a “packet of consciousness” the way it has given a quantifiable value to a “packet of energy”. It's probably hard to do, but it's probably worth trying.

Surely there is no doubt that consciousness exists. Look at a live body and look at a dead body. Something's different. But how can we measure this difference?

Let's step back and revisit what we know. We know that the universe, in order to exist, must be observed. We've found out that humans make good observers and rocks don't. Or at least metals don't. The metal components of an observation platform for the two-slit experiment are not sufficiently conscious to make photons behave as particles. A measuring device has to be turned "on", or even just "planned to be turned on", by a human mind, for that to happen. There's some kind of animate/inanimate disparity here. The difference between that which has an exerciseable will and that which doesn't. A rock obeys "laws" of the universe. A human can turn left or right. A human has a conscious will, a rock, apparently, does not.

So far so good, except for the fact that we've been too anthropic. People-centered. We've neglected to imagine that a tree is probably capable of "observing" another tree. Observing with eyes? No. Observing with consciousness? Yes. Maybe one tree can detect another tree by sensing the oxygen excrement with which it is crapping up a perfectly invigorating carbon dioxide atmosphere. One tree recognizing another is not only possible, but quite possibly requisite under natural "law". Do you, as a young tree, really want to expend a lot of energy growing roots in a certain direction when you know there is already a big tree over that way sucking up soil nutrients and strangling cheeky little invaders like yourself?

I'm not convinced that the macro world of large objects mimics the micro quantum world, but let's suppose that, as usual, I'm wrong: that macro objects must be observed to exist. Some scientists have actually worked themselves up into a lather

wondering how there could be dinosaurs if we weren't there to observe them, or whether trees exist when nobody is there to see them. Clearly both dinosaurs and trees existed before the dawn of human consciousness and therefore there is something wrong with our thinking about consciousness. Or humans. Or both.

It really goes back to Schrödinger's cat. Hypothetically a cat is put in an opaque box wherein a quantum-level radioactive decay trigger with a one-hour half-life has a 50/50 chance of releasing a poison pellet to kill the cat. According to quantum theory: after the box is closed and an hour has passed, the cat exists only in a state of quantum probability, neither alive nor dead, until someone opens the box and "observes" whether it is, in fact, alive or dead.

This of course is stupid. Obviously the cat is conscious and therefore, itself, quite capable of observing whether it is alive or dead. But as usual, I probably don't understand the problem. I read that this state of quantum probability also exists for a "magnetic flux simultaneously inhabiting two sides of a barrier" until some observer takes a peek, at which point it "pops onto one side of the barrier or the other".

Is a magnetic flux conscious of itself? I doubt it. But this quantum mystery finger pointing at an "offshore" observer opens up an entirely new arena of deliberation on this topic, so let's not give up yet.

It seems to be a tenet of quantum theory that the observer must be "outside the system" being observed. Either that, or as I've proposed, quantum analyses might not hold for macro events.

According to Stephen Barr in *Modern Physics and Ancient Faith*:

The logical structure of quantum theory requires that the intellect/observer lies to some extent beyond the possibility of physical/mathematical description. [P 232]

I don't know how to mathematically describe a cat. I don't think it's possible. So far so good for my theory. But then:

Can the observer be something physical like the system that it is observing? No. The mathematical descriptions of the physical world given to us by quantum theory presuppose the existence of observers who lie outside those mathematical descriptions. [P 237]

This sounds, at first, like pretty hefty evidence for the existence of God – an observer outside the system? However, there's a big problem with that too. God would also be “observing” when the two-slit experiment is just coasting along unobserved by us, recording waves instead of particles, so that fantastic cave painting gets washed away by leaky thinking.

It's time to paint outside the cave.

The reality of this situation is that reality is telling us that math is not enough. That our mathematics is insufficient to penetrating the mystery of consciousness. We live in a world where math is so poorly understood that it goes essentially unchallenged. So let's challenge it.

## MATHEMATICS IS WRONG

“Pure mathematics is the subject in which we do not know what we are talking about, or whether what we are saying is true”. –Bertrand Russell [Stephen Barr; Modern Physics and Ancient Faith; P 282]

Is it possible that quantum calculations yield only probabilities – approximations – because our mathematics is only approximations? Surely the math guys thought this through long ago. Yes???

Is a number with endless decimal places an actual quantity? Of course not. It's an approximation. Like a shoe size. Which is to say that all measurements are susceptible to being erroneous.

But here's a bigger problem: Mathematics cannot describe the "beginning" of the universe when Time = 0, because no matter what number you multiply by zero you get zero, and no matter what number you divide by zero you get infinity. Physicists can begin their calculations a billionth of a second after the Big Bang, but there is no way math can accurately describe the Big Bang. (Or one second before the Big Bang.) Mathematics does not give a complete description of reality. [Stephen Barr; Modern Physics and Ancient Faith; P 271]

So we've dispensed with decimal places, zero and infinity. How about one? We all know what one is, right? Like one giraffe. Or one rock. But if all life is interconnected energy how can we

draw the boundaries of these objects? Where does “giraffe” end and “atmosphere” begin? On the macro level it’s pretty obvious, but on the quantum level that rather gets fuzzy, what with all these zooming electrons. And that problem is compounded by the fact that we do not even know what an electron really *is*. But let’s not look for problems where there aren’t any. We can feel comfy with numbers on the macro level, until we get to two.

Two is a problem. One giraffe and one rock equals two what? Two things? One nose and one peanut are also two things. So what does the category “things” actually describe? Nothing. Pretty much nothing, a useless category. That’s why mathematicians love to work in symbols. Symbols aren’t as messy as numbers. Mathematicians aren’t left coping with untidy concepts like one and two. They can *define* what the symbol means. Like acceleration, or mass or the collapse of the wave function.

Physicists love to blivate about the “collapse of the probability wave function”, by which they mean that the multitude of possibilities that could occur have disappeared, leaving behind only one actual event. Ah...the collapse of the wave function. It explains so many things! The problem is, no one has ever *seen* a wave function collapse. No one. Ever. It’s just a probability, drifting through a galaxy of other probabilities. Does anyone actually know what any of these mathematical speculations really mean?

I’m not a mathematician. Not even close. And all we’ve looked at here is 0, 1, 2 and the wave function. But already we’ve stumbled upon huge problems by relying on mathematics to

describe our world. Now imagine math describing a cat. Or a human. I'm sorry to be the one who tells you this, but using math to understand our world is like flapping our arms to fly. It'll never work. We can blow some air around, but it'll never work.

Eugene Wigner, a Nobel prize winning physicist, in a classic essay on the implications of quantum theory, wrote that quantum theory is incompatible with the idea that everything, including the mind, is made up entirely of matter. [Stephen Barr; Modern Physics and Ancient Faith; P 228]

See, that's the problem. Math is only good for measuring matter. Quantum theory is itself *incompatible* with the notion that we live in an entirely physical universe. We are not unlike scientists a mere couple hundred years ago theorizing about disease-causing "humors", before Anton Leeuwenhoek stuck a microscope under our noses and said, "Hey, look at all these bugs"... No shame. We don't have the right tools yet. But we do need to support and encourage that guy who's living in a garage on food stamps, ostracized by corporate commercial science, spending his days consumed by the task of trying to find that "new" microscope.

## ADDICTION AND FREE WILL

So far I've argued that a free "ranging" will, a consciousness capable of making the choice to observe or not to observe, is a doorway into understanding the world in ways we do not yet understand it. It seems probable to me that consciousness begets

consciousness, and that that begetting is turned off or on by the exercise of will. The more a person thinks about the Supreme Consciousness, the more the Supreme Consciousness comes to inhabit this world. Just like the more we focus our consciousness on individual photons, the more physical those photons become in our world.

Cave painting. I know.

By now we should be convinced that mathematics says that we will never understand the world by means of mathematics. That's pretty important. Math can give us some fantastic approximations. Ways to calculate rocket trajectories or map genomes. But math is a man-made contraption that is no more effective for discovering the hidden parts of the universe than waving burning sticks and drawing on walls.

It's time to take a deeper look at free will and consciousness. But to do that we need to take another run at unfree will, armed with these new things we know. The more we understand unfree will the more chance we have to understand free will.

So far Arthur Schopenhauer, myself, and a few hundred million Hindus and Buddhists have claimed that our lives are driven by unfree will. The will to be. The striving to become. Become what? Become aware. Become more conscious. But, unfortunately, also to become an ego monster of insatiable desire.

Says Schopenhauer:

As long as our consciousness is filled by our will, so long as we are given up to the throng of desires with their constant hopes and fears, so long as we are subject to willing, we can never have lasting happiness or peace. [*The Story of Philosophy* by Will Durant; p323]

He's talking about egoism. Self-will run riot. We are all steeped in it from day one. Babies screaming for the stuff we want. We are born with enormous egos and spend our entire lives shrinking them down, until the moment of death, when our ego is finally extinguished. Both a happy and sad event. The ceaseless striving is over, but so is our individual life adventure.

There is really no good reason to imagine we have a life after death, except for the fact that we have trouble imagining *not* being here...or somewhere. This much I can tell you: we are not going to have an ego after death. We are not going to be winning Nobel Prizes or sleeping with starlets or quarterbacking the Jets. That's all ego-stuff. Baby stuff. That goes out the door with death. In the best-case scenario our individual experiences might join the knowledge base of the Collective Unconscious and become part of the instinctual Memory Field for yet-to-be-born humans. As much as I hope I'm wrong about life after death, I don't see any reason to hope for anything more.

However, what is offered through religion and through sainthood is an early dumping of the ego, so that we can actually enjoy a few years on earth without the maddening discord of unchecked will. In every single religion, spiritual growth is achieved by the annihilation of ego. The surrender of one's will to a greater entity.

Says Schopenhauer:

The Saint is the Fool in Christ who refuses to fight and absolutely overcomes the struggle of will. [*The Story of Philosophy* by Will Durant; p339]

Whoever is clear-eyed and clear-souled enough to see that we are all members of one organism, all little currents in the ocean of will, is on the direct road to salvation. [*The Story of Philosophy* by Will Durant; p339]

Genius is the highest form of will-less [ego-less] knowledge. Man is mostly will with little knowledge. Genius is mostly knowledge with little will [ego]. [*The Story of Philosophy* by Will Durant; p326]

There's a reason for all this talk of egotism, and the reason is that overblown ego is overblown will. Overblown willfulness. Unfree will. That's right. Too much willfulness is *unfree* will.

Probably the most unfree will of all is addiction. Maybe you were in a war, or had a bad accident, and got beat up emotionally and physically. Then you discovered that drinking beer got rid of the pain. So you drank beer for years. Then you decided to stop drinking beer and discovered you couldn't. It wasn't that easy. Every morning you'd tell yourself you weren't going to drink today, but by 5 pm you'd be plastered. Your "will power", your free will, had been removed from you. This is Addiction. You could no longer make a decision and stick to it. Not about this. Because every cell in your body craved alcohol.

Stay with me. Here's where it gets tricky. Lots of people think this is the time to double-down and get *more* willful. That stopping drinking is just a question of will *power*. For some few that does work. But others find out they must engage in a profound paradox to recover from this addiction. They must use their will to annihilate their will. They must use their free will to annihilate their unfree will. They must surrender all willfulness and accept life on life's terms. And then their unfree will, the compulsion to drink alcohol, begins to break up and dissipate. It's a mystery. Some consider it a spiritual mystery. But it is an amazing insight into the operation of will. By *choosing* to be vastly less willful, across the board, the will to drink, the compulsion to drink, is removed. And one can then build up a history of not drinking. And literally find what many call salvation: freedom from self-will run riot.

On one hand this paradox seems to provide yet more evidence that there is no such thing as free will. But on the other hand it seems to give deep insight into the functional operation of free will. The ability to *make* a decision. The ability to "go against" regular will, patterned willfulness, the ceaseless striving to be and to become. The freedom to short-circuit business-as-usual, and execute a move in a new direction. That's free will.

Free will is "counter-intuitive". It is a movement against personal history and expectation, all the way down to the molecular level, depriving greedy cells of the alcohol molecules they have been habituated to crave.

In far-and-away most cases, recovery from alcoholism is not accomplished via the exercise of willfulness. It is the freely chosen suspension of willfulness that makes the difference. The subversion of normal will that ushers in change. An unpredictable slap in the face of determinism. For it is certainly not determined or predetermined that any alcoholic will stop drinking. Only 1 in 33 people who try to stop drinking actually do. And virtually the only thing they have in common is a conscientiously applied suspension of willfulness. Using free will to annihilate normal will.

This is how free will “breaks into” the consciousness loop I described earlier. Though will is certainly an element of consciousness, by suspending our will, we mind-meld with a greater consciousness. (Yeah, that’s a Star Wars term but so what?) When we finally get rid of our ego we discover that who we think we are is gone, but *we’re* still there. Our consciousness is bigger than we are.

Determinists could view this ego-annihilation, this anti-behavior, as mere delinquency or contrariness. Every sign points down one road, but the delinquent takes another. So does the artist. There’s no creativity without it. And no vandalism. Clearly contrariness is “programmed” into the species, maybe even at some deep level of quantum indeterminacy. But this “programming” (computerese for “instinct”) is not as predictable in individuals.

I learned in sociology class at the University of Chicago that it is almost impossible to predict what a single person is going to do.

But quite possible to predict what a million people are going to do. Here's an example:

If a person has a 52% chance of voting Republican and a 48% chance of voting Democrat it would be hard to say which way that person will vote. Fifty-two to forty-eight. But if 100 million people have the same chance, the probability of the Democrat winning is one, to a one followed by 10,000 zeros. [Stephen Barr; Modern Physics and Ancient Faith; p 178]

What I'm saying is that the human species has free will. It has to, to survive the quantum-randomness-induced chaos of life across millennia of time. And that since evolution selects for beneficial traits, most humans have free will also. Deer too. But it's impossible to know ahead of time which ones have it, or have a lot of it. Which is exactly what makes it "free".

We are all cells in the body of humanity. An ant is an individualized cell in the body of a creature called "all ants". A deer is an individualized cell in the body of a creature called "all deer".

Some deer run away from smoke, some run toward it, some lay down, some run in circles, and some run to the top of the nearest hill to see where the hell the smoke is coming from so they can run in the opposite direction. Clearly the hill-climbing deer, through a combination of memory and decision-making, is the most likely survivor.

A hundred years ago grizzly bears used to run away when they heard a rifle shot. A few years ago a friend of mine in Montana

sat on a ridge deer hunting, enjoying the thrill of watching a mama grizzly and two cubs lazing about in the meadow below him. BOOM! The grizzly heard a shot and stood on her hind legs analyzing where the shot came from. Then she charged off *in the direction* of the shot with her two cubs scampering in tow. Why? These days grizzlies are a protected species, and they have learned that where there's a gun shot there's a dead deer or elk. Just waiting for them. And there's nothing the surprised sport hunter can do except get out of the way and let her have it.

Her cubs were learning this behavior from her. And maybe she learned it from her mom. But very likely her grandma was one old grizzly who suspended her habituated unfree "will to live" and exercised her free will to go see what the hell all this shooting was about.

If grizzly bears have free will, so do we.

## CREATIVITY

Creativity is a flood tide of free will. I write and I paint. What I know is that decisions come so fast and furious – what color to use, what word to use – that I get lost in a quantumly uncertain, excitedly mutable, mind set. Sometimes I choose normal colors, sometimes I choose "wrong" colors. Blue water/black water. Sometimes I choose normal words, sometimes "abnormal" words. Fat as a pig/fat as Wall Street bankers.

You can't tell me, an artist, there's no free will. But you certainly don't have any trouble convincing me that people don't

use their free will very often. I suppose it's possible there are some people who go through their entire lives without ever exercising their free will. Sheeple. Maybe they'll survive forever, like cockroaches. But more likely they'll go extinct, like brontosaurus. I don't know. I don't really care. I wouldn't want to live like that, secure as it may seem.

For my part I simply do not know what people do, who do not do creative things, every single day. I don't know why the hell somebody would get up in the morning and battle their way through the rat race if they didn't get to spend at least one hour a day doing something creative. Every single day. Let's say every morning you write two pages of a novel before you go to work. At the end of a year you have 730 pages written! That's one or two books. But maybe, like me, your first three or four books suck. Then in your fifth one something magical happens. It hangs together and people get something out of it. Then maybe you write another dud, but then the seventh book takes on a life of its own.

I spent many many years writing two fantasy novels, but they never hung together and I couldn't finish them. Then one day I realized that both books were talking about similar themes. So I started cutting and pasting. I followed the first chapter of the first book, with the first chapter of the second book, then kept alternating chapters back and forth for a few hundred pages. Then wove the two plotlines together and wow! *Your Brain Is Not Your Own* came into being. It's a very creative book. A book simultaneously unfolding on three distinct story levels: the physical (plot) level, the metaphorical (symbolic) level, and an eerie (ethereal) level, floating mysteriously above the written

words, humming prehistoric melodies between the reader's ears, painting bizarro creatures on the cave walls inside his skull, illustrating the "meaning" of evolution.

My point is, I used to sit down in the morning wondering what in the world I was going to write. And then, after awhile, I just started writing. Clearly it was a kind of channeling. I called myself "God's pencil". And this is another instance of using one's will to annihilate one's will. I used my free will to clear my mind, so that quantum randomness/arbitrary thought-experimentation, could take place between my ears. I opened my consciousness to other realms. Perhaps even the Overmind.

Says Schopenhauer: ...This forgetting of the individual self and its material interest, this elevation of the mind to the will-less contemplation of the truth, is the function of art. [*Ibid* p336]... Art is the power to elevate us above the strife of wills. [*Ibid* p337]

How 'bout that?

That's the subtlety of art. While it's true that no physical work of art can be created without an exertion of will (art is not merely a "thought"). It is also true that I cannot *will* myself, force myself, to create. However I *can* will myself to quiet my mind, stop worrying about money or heartbreak or bodily aches and pains, and grab onto a pencil or paintbrush, and wait patiently, to "let" new "thoughts" in. To grab hold of a thought that comes out of nowhere, literally nowhere – certainly nowhere in my conscious mind – and write it down on paper. That's so magical it's almost *scary*.

But not every missive from the Overmind suits me or makes sense. Most often, more than 90% of the time, I employ my free will to change it. I might be visited by an image of a person wearing a big fish on their head like a huge baseball cap. (I actually saw this once during a run of huge red snapper in Mexico.) The image is funny, but I might decide that putting a turtle on the person's head makes more sense in the story I'm working on, because maybe I used turtles in earlier scenes. Or maybe I keep the fish cap and go back into the story and change turtles to fish in earlier scenes.

Stupid example but I hope you get my point. First I use my will to quiet my inner screaming baby. Then I allow thoughts to emerge out of "nowhere". Then I amend those thoughts, edit them with my will, to fit the story. Or something like that.

What I do know is that I am rewarded for this work with endorphin releases. Father Nature wants me to do creative stuff. He takes away my pain when I do the work. I can sit down feeling miserable, with a headache and broken heart, and within fifteen minutes of doing creative work I snap alert to the realization that my pain is gone. I suppose it happens with all work. You don't feel the aches and pains and bummers again until you stop working, and then, of course, it's Miller time. Time for alcohol and drugs to keep killing the pain. So we get hooked. And maybe creative people more readily than most.

Art is not made by just messing around. By playing with things. Musical ditties and napkin doodles are made that way. And once

in awhile they have good ideas in them. But art has form and content. Art is made by making choices.

It's important to note that quantum randomness is the opposite of "choice". If I were trying to make the case that quantum indeterminism *is* free will I would be sorely mistaken. If our brains were directly and repeatedly affected by quantum randomness we would be vulnerable creatures, unexpectedly doing stupid, life-threatening things. Jumping off bridges or abandoning our kids. By and large we are conservative creatures, who do *not* take risks. Who repeat the same patterns over and over. It's only because the forces of tides and storms and fires are so unpredictable that we need to be equipped with "decision-making" mental apparatus to deal with them. Most of the time we're just following formulas. Following recipes for baking cookies inside our brains.

## WHAT MAKES THE FIRST MOLECULE MOVE?

As we work our way backwards through the decision-making process we arrive at the moment just *before* a decision is made. This is a cave painting I call "what makes the first molecule move?" Or...how does thought transform itself into action? How does consciousness compel a molecule to exert the chemical energy to make a muscle move?

A driver preparing to make a left-hand turn evaluates globs of light striking his eyeball until he makes the "decision" to yank the wheel left. But what fired the neuron to command the hand to move the wheel? What made the first molecule move?

How can a writer cull “thoughts” out of “nowhere” and scribble them on paper? What makes the first molecule move?

Science seems to have neglected this line of inquiry entirely. We have no scientific model to explain the interface between “thought” and action. Because we have no idea what consciousness is we have no idea how consciousness “wills” action.

If a general tells a soldier to “shoot the cannon”, an unquantifiable amount of decisive “thought” – which *seems* to appear out of “nowhere” inside the general’s brain – “transforms” into electrons that “fire” a neuron which sends a signal to his mouth...where the signal is physically projected through the air at the soldier’s eardrum, thereby entering his brain and bidding his finger to depress a trigger which releases an enormous amount of stored explosive energy. That’s power. Minute amounts of energy unharnessing vast forces.

Let’s look at these examples a bit closer.

The driver making the turn is evaluating light that is hitting his eye, so he is in tactile contact with the world around him. A strict determinist would say that the light is “making” him make the decision – which I don’t buy, because somewhere in his “mind” – that mind which we cannot find – a decision has to be made. So what makes the first molecule move?

We’ve already talked about writers culling thoughts from “nowhere”. Why would I suddenly start talking about apples

right now? Why? I don't have a clue. Another mystery to me is how come I see actual images in my dreams, but in my waking life, if someone tells me to "picture an apple", though I can "imagine" an apple in my "mind", but I do not see an actual "picture" of an apple. Do you? Close your eyes right now and "picture" an apple. Is there an apple there? Or just some reddish whitish spots on a black background? What's that about? I "see" images in my dreams but not (in my mind) when I'm awake. Even when I *will* myself to see them.

We're stuck. Let's enter somewhere else in the progression.

What about the cannon? The soldier is told by his superior to pull the trigger, so we could say the push of the airwaves striking his eardrums creates a neuron current that goes to his brain. But then what? It's like the light on the driver's eyeball. Neither the light nor the sound of the general's command "makes a decision" to act. The mind does.

The general's mind is even more obscure. He is evaluating artillery history, topology, daylight, weather, range, and god knows what else, to "decide" when to bark the command to fire the cannon. Neuroscientists tell us that there is increased electrical activity" in some part of the general's brain before, and when, he makes his decision. However...electricity, itself, is not a molecule.

Indeed, it's time to admit we don't even know what electricity is. We know what it does, or *seems* to do. Electricity can be understood as electrons bumping into each other from one atom to another atom, thereby making a "current". But I have yet to

meet the electrician or electrical engineer who can tell me what electricity *is* or *how* it does what it does.

We picture electrons as if they were planets orbiting around atomic “suns”. But that’s not at all what it looks like down there. Physicist Robert Oppenheimer said that, “the term ‘electron’ is only a term of convenience...An electron is not a real thing and does not have a real substance.” Therefore, instead of providing concrete answers in physics investigations, the existence of electrons opens the barn door onto fields of endless speculation. Electrons are like the missing link to an entire different universe of physics.

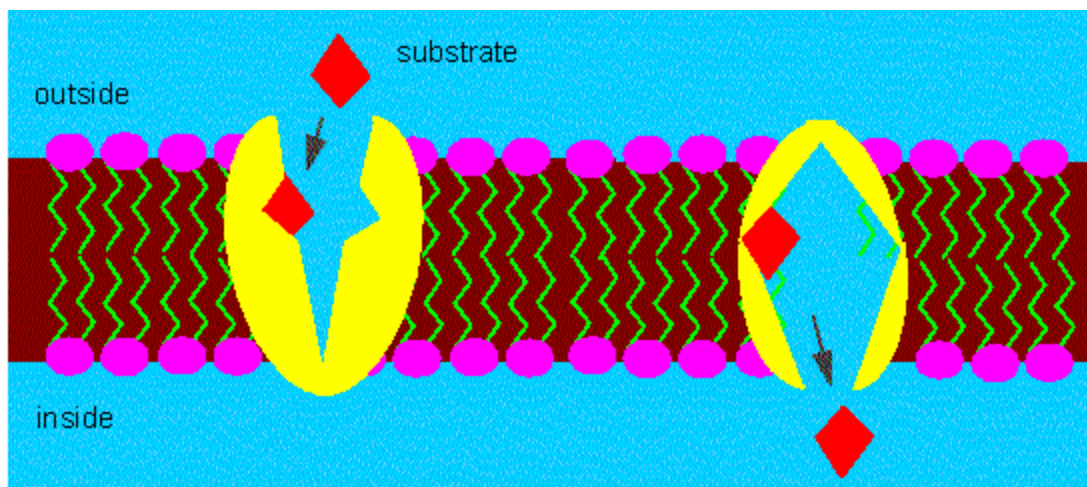
And on top of all that, the electricity in nerve cells does not operate in the same manner as the electricity in a copper wire, which is a purely electrical event. A nerve impulse, a nerve “firing”, is an electrochemical event, that unfolds sort of like a wave of falling dominoes. Sort of.

When a physical stimulus, such as touch, taste or color, acts on a sensory receptor cell specifically designed [by nature] to respond to that stimulus, then the **energy** of that stimulus (mechanical, chemical, heat, light) is transduced or **transformed into an *electrical response***. This response is the “receptor potential”, a type of local potential that, when it reaches high enough amplitude, generates the nerve impulse. [*Encyclopedia Britannica*; 15<sup>th</sup> edition, 2005; Nerves and the Nervous system p 791]

Got that? Don’t worry.

The simplest version works like this: The inside of a neuron is highly negatively charged. When you press your finger against the table, a tube-like protein molecule in a neuron membrane is bent, opening a hole in the membrane. This allows positively charged ions to rush into the neuron reversing the polarity of the cell and causing it to “fire”. (Ions are atoms or groups of atoms that gain an electrical charge by losing or acquiring electrons.) The tube-like protein molecule is called an “ion channel”.

Here’s a picture of an ion (substrate) moving through an ion channel (yellow bean) in a cell membrane:



That’s the simple version.

A more complicated version is called the “voltage-gated ion channel”. This is the one that interests me but not much is known about it yet. A voltage gated ion channel is one in which an electric field outside the neuron stimulates the ion channel to open.

The channel response or activation, whatever the stimulus, is called **gating** and **involves a series of molecular movements or conformational changes within the protein that opens the pore.** [*The Ion Channel: Through the Keyhole*; Naked Science- October 2008; Ana M. Rossi is a Junior Research Fellow at Queens' College in Cambridge]

Let's say a photon (a "quantum packet") of blue light hits a photoreceptor molecule in the eye. The photon is "**absorbed**" by the electron cloud (plasma) surrounding this photoreceptor protein molecule *exciting* the electron cloud to a higher energy state – which is another way of saying the **photon's energy is transformed into electrical energy** (excited electrons bumped to "higher" orbits). This higher energy (voltage) passes a threshold as more blue photons pile on and causes the protein to bend and break apart. This breaking-apart initiates a cascade of morphing protein enzymes that culminates in opening the ion channel and allowing the movement of sodium ions into the photoreceptor neuron, thereby "firing" the nerve impulse to report to the brain that a bit of blue light is being noticed in this part of the eye. The brain merges this with other bits and creates a picture of what the eye sees.

***By this process one single photon can control millions of sodium ions*** – precipitating a huge surge of nerve impulses. Here's the science. Good luck:

### The Rhodopsin Cycle

The visual pigment rhodopsin (sometimes called "visual purple") is bound to the plasma membrane of the rod and

forms transmembrane protein complexes within it. Rhodopsin undergoes a cyclic decomposition and reconstitution in response to the presence of light. This rather complicated cycle is the basis for absorption of light and its transduction into a nervous signal.

Rhodopsin has two components: scotopsin, a protein moiety; and 11-cis-retinal, a carotene derivative. When combined, these two subunits create the conjugated rhodopsin molecule.

Energy from impinging light excites the electrons in the 11-cis-retinal subunit and converts it to a different configuration, 11-trans-retinal. Because this is conformationally incompatible with the scotopsin moiety, it begins to detach from it, and the rhodopsin conjugate begins to break up into its component parts.

The disintegration of rhodopsin into retinal and scotopsin is progressive, with a series of short-lived intermediate compounds formed. The eventual result is release of the two components of rhodopsin from each other completely. One of the breakdown products, metarhodopsin II, is the agent that ultimately effects the change in the rod membrane's charge.

Metarhodopsin II is an enzyme. It acts to activate a second membrane-bound protein in the rod, transducin. Transducin is in its turn an enzyme activating rod-resident phosphodiesterase, a third enzyme in the cascade, capable of hydrolyzing cyclic GMP.

Cyclic GMP's role is to keep sodium channels in the membrane of the rod open, so that sodium flux is facilitated. In dark conditions, this is the normal situation: channels are open, sodium flux from the extracellular space is approximately equal to sodium loss via the pump system of the inner rod segment, and the rod membrane is not hyperpolarized.

Under conditions of impinging light, when the metarhodopsin II—transducin—phosphodiesterase cascade is initiated, however, cGMP is destroyed, sodium channels are closed, and the flow of sodium ions into the rod outer segment is slowed or stopped. This causes it to become more negative, i.e., hyperpolarized in the presence of light. The cascade is reversed by the presence of rhodopsin kinase, another enzyme present in the rod outer segment, and the sodium channels are re-opened.

### Implications

The vast amplification of the plasma (electron) membrane in the rod outer segment, and the catalytic properties of the enzymes in the cascade from metarhodopsin II—transducin—phosphodiesterase—cGMP breakdown mean that a single photon of light has a great effect on the rod membrane.

One photon, the minimum quantity of light possible, will cause the movement of millions of sodium ions, because of the catalytic nature of the enzymes and the large surface

area provided for them to work. Hence the rods are extremely sensitive to light. Animals that live in dark environments (such as deep-water fishes and cave-dwelling creatures) always have far more rods than cones, because it is important to them to be able to see in the minimum amount of light. Other adaptations of the eye structure, such as a large pupil diameter, are also important; but the sensitivity of the chemical cascade is the most important factor in determining the ability of an animal to respond to dim light. [Cyclic Pathway of Rhodopsin and its Relationship to Hyperpolarization of the Rod: The Rhodopsin Cycle; <http://education.vetmed.vt.edu/Curriculum/VM8054/EYE/RHODOPSN.HTM>]

Whew!

The thing to get out of this is that one tiny quantum particle of energy can set off a biochemical cascade that can amplify and unleash cannons of energy. We will be returning to that point over and over.

So this is more or less how vision works. It's been studied in great detail because it's so important to us. How do other ion gates function? That's hard to know because, according to Anna M. Rossi, we have an awful time studying individual live proteins. However, by studying masses of them it is known that receptor proteins and their associated ion channels "consume energy" and change shape. These then are "the first molecules to move" to fire a neuron,

Furthermore we now know that **the first “thing” to move** – the first part of the human body to “move”, in order to “fire” a nerve impulse – **is an electron** in the “excited” electrical field swirling around a protein molecule in a sensory receptor cell. The “impinging” photon (a quantum particle containing energy comparable to that of an electron) bumped that electron up to a higher energy level, which set off the entire cascade of electrochemical responses resulting in vision. Powerful little electron that. Powerful like Napoleon. Little guy who effects big changes.

Are there other little “things”, other quantum particles besides photons, that could set off that cascade? Yes there are.

Hold that thought. We’ll be back to it.

With this basic model in mind we need to back up and review it. The first statement we made about this nerve impulse process was that when a sensory receptor cell is stimulated the **energy** of that stimulus is transduced or **transformed** into an **electrical response**.

Here’s the bad news. According to Fred Alan Wolf:

In discussing energy I would like to point out that there isn’t a physicist alive who knows what energy actually is.  
[*The Dreaming Universe*; Fred Alan Wolf; Simons and Shuster; 1994; p 51]

What!!! Are you kidding me? For the sixty years I’ve been alive you science guys have been talking about energy like you actually know what you’re talking about and you don’t! This is

turning into an insidious pattern. Why am I not surprised? Exasperated but not surprised. Living with the deception that science understands instinct and memory and consciousness was bad enough. But now energy too? How could I be so stupid?

The best we have come up with is a concept described in terms of work or force multiplied by the distance over which that force is applied. Thus a force of ten pounds applied through a distance of five feet uses or releases an energy of fifty foot-pounds. No one has ever seen or sensed energy, in spite of the fact that we use these terms as if it were quite tangible...All we have are formulas indicating how energy takes form, but not what it is. [*The Dreaming Universe*; Fred Alan Wolf; Simon and Schuster; 1994; p 51-53]

Fred Wolf goes on to explain that when a falling egg splatters on a sidewalk, according to their formulas, the “energy” of the egg is preserved in this splat of goo. Which is about how my brain feels after this revelation. We know what a raisin is but not what energy is? Preposterous. People talk about energy all day long on radio and TV and what they’re talking about is a result, some mass that’s been moved. Or could be moved. If media talking heads prattled on about consciousness all day long wouldn’t you get bored? Why not with energy? Consciousness is more important to every second of our lives than energy. I’ll tell you why not, because energy can be bought and sold much easier than consciousness. For every consciousness researcher, we finance a thousand energy researchers, fiddling with test tubes and tweaking engineering models – trying for that big

breakthrough, so they can sell their discoveries to Big Oil companies.

Makes me puke. What if Socrates and Newton and Einstein had thought like that?

When science nerds deceive us into thinking they know what they're talking about for decades, or centuries, on end, they stifle further inquiry into important subjects. Like instinct. Or memory. Or consciousness...Or energy.

All right. I'll try to rein myself in. I needed to retch that out.

That brings us to part two of the above statement we are analyzing. The energy arriving from the photon is “transformed”, whatever that means – that's like the egg hitting the sidewalk – transformed into an “electrical response”. And what is an electrical response? Well, since we don't know what an electron is we certainly don't know what an electrical response is. I guess in this case “electrical response” is being used in the same way one might use “liquid” to describe oceans, lakes, blood, battery acid, and tears. Generic shorthand.

The weak link in this whole scientific explanation is where photon “energy” is transformed into “electrical energy”. Are photons equivalent to electrons? They have approximately the same energy. Are they electrons that glow or something? Are they actually the same thing? If so what thing is that?

In my opinion, this “blank” in scientific precision is a mouse hole into entire new worlds of scientific understanding. And I'm

gonna burn up a lot of fat jamming myself through that mouse hole.

Basically what these guys are telling us is that something we don't know is transformed into something else we don't know, so now the second thing has more energy. And we are supposed to accept that for an answer to how our nervous system, our brain, our consciousness itself, works. Phooey! Science has failed us. Zero times anything is zero. This is just a clique of men and women making mathematical models of things they don't understand, trying to predict behavior according to something they call "laws". But "laws" are broken all the time, in government *and* in science. And what is the point of all those quantum theorizations if not to propel us beyond mechanical laws into a visceral appreciation for probabilities.

There is very little visionary thinking in current scientific speculations about energy. I don't know how these guys would get the money they get, to do the work they do, if they weren't occasionally pumping out saleable products like atomic bombs and Teflon.

OK. You're right. I'm not doing so well reining myself in. Ugh. I better just quote from Encyclopedia Britannica:

Investigators believe that the resting, activated, and inactivated states of the sodium channel (ion channel) are due to **voltage-dependent conformational changes** in the glycoprotein component. These changes result from the ***electrical field*** (my italics) on the charges and dipoles of the amino acids within the protein. **With a large electrical**

field applied to it, the protein has been observed to change its conformation from a stable, closed resting state to a stable, open state in which the net charge or the location of the charge on the protein is changed. [*Encyclopedia Britannica*; 15<sup>th</sup> edition, 2005; Nerves and the Nervous system p 794]

Take a deep breath. This is really really important. It's the mouse hole into the entire argument I am trying to make in this paper, so I want to get it right.

What is known is: something we don't know (energy) is transformed by a sensory receptor protein into something else we don't know (electricity) to produce an "electrical field" that changes the "net charge" or the "location of the charge" of the ion channel protein. (The yellow "bean" in the picture above.) The changing of the charge opens or closes the ion channel, letting ions into or out of the nerve cell, firing or pausing the nerve stimulus.

The original "electrical field" seems to be caused by an electrical fluctuation, electron movement, in the electrons surrounding a protein molecule designed to be receptive to a certain stimulus. For instance: a photon of blue light hits a sensory receptor in the eye and *excites* electrons.

Moreover, the "excitation" in the "electrical field" that energizes the ion channel, and thereby fires the nerve cell – this mini electrical field – is where blinks and kicks and thoughts *originate* in our nervous system. *And anything, from anywhere,*

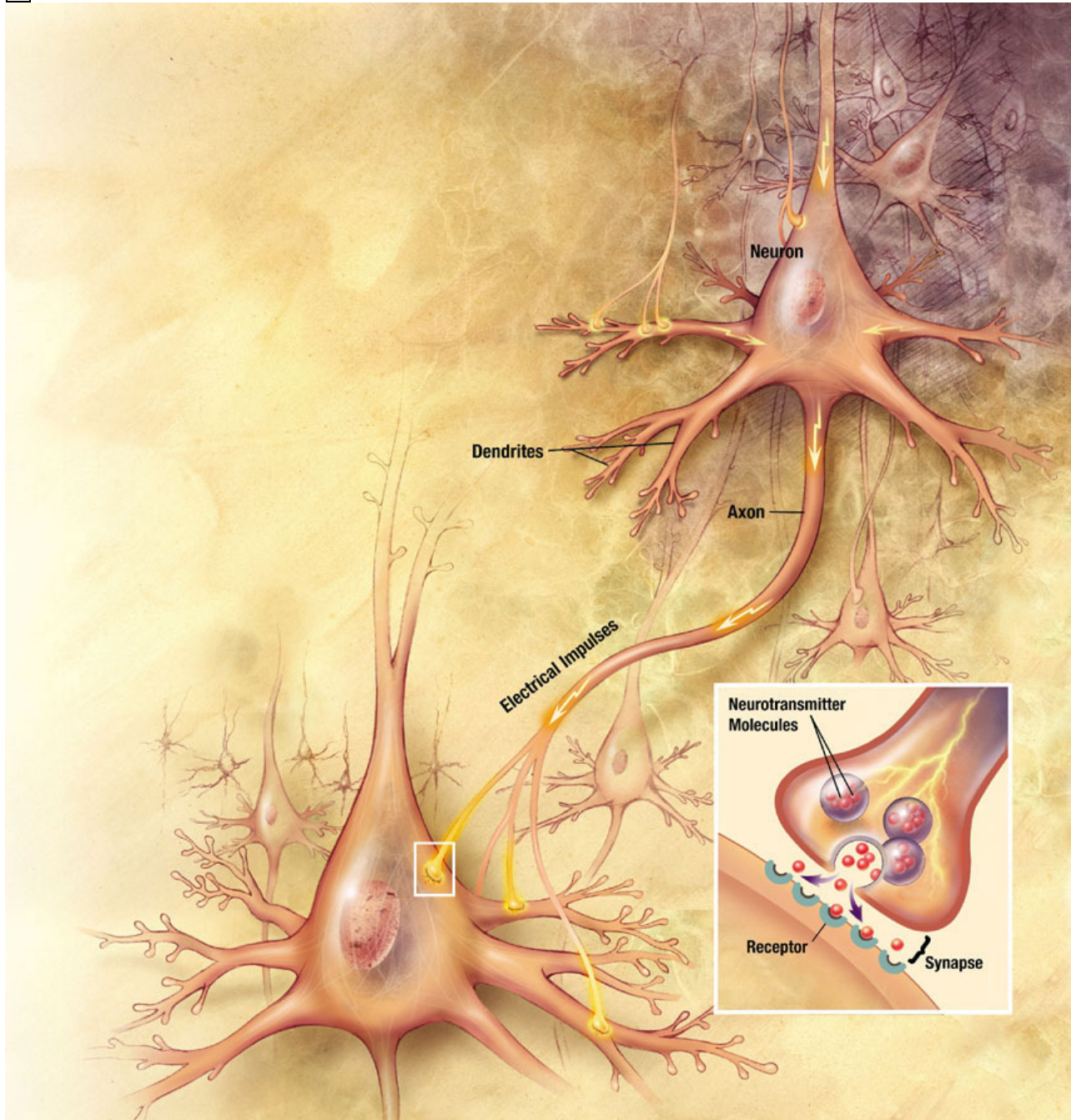
*that can cause the excitation of that electrical field, can cause a nerve to fire.*

Now we're up and running. The cave painting is finally taking some shape. I can see a few antlers and hooves. But let's go back to what we were saying about ion channels and flesh in some upgraded grade school science about how nerves actually "fire"...

... So, when a sensory receptor on a nerve cell is stimulated above a threshold value – by touch, chemicals, heat or light – a small electrical field is created by a protein molecule designed to react to specific stimuli by creating a swirl of electrons. An electrical field. This electrical field stimulates a protein molecule called an "ion channel" on the nerve cell membrane to open, and positively charged ions suddenly rush inside the nerve cell. (Ions are atoms or groups of atoms that gain an electrical charge by losing or acquiring electrons.) This rush of charged ions reverses the polarity of the cell membrane.

Within milliseconds the cell reacts and expels the positive ions to regain its normal (resting) negative charge. This incredibly rapid depolarization/repolarization creates a rippling "wave" (domino) effect along the nerve cell's membrane (skin). Scientists call this the "**action potential**" of the nerve impulse, and it is what we mean when we say the nerve is "firing".

Here's a picture of a nerve cell. We want to pay particular attention to the insert in the lower right corner:



Action potentials arriving from sensory receptors at the upper right neuron stimulate currents that flow “up” that cell’s dendrites, through the axon hillock, and “down” its axon to its synaptic knobs, releasing [neurotransmitter](#) molecules that stimulate the next neuron or target cell.

(lower left) Neurotransmitters are chemicals which relay, amplify, and modulate signals between a neuron and another cell. Neurotransmitters operate in the synapse, the gap, between cells. [wikipedia: action potential]

Got that?

Don't worry. So far we know that the receptor proteins for the "ion channels" in the neuron cell membrane are most likely "the first molecule to move" in conscious decision-making. And that they stimulate the nerve impulse, which moves from nerve to nerve, across chemical synapses.

But there are some new parts to this picture they didn't tell us about in grade school. There is a second way to transfer a nerve impulse from neuron to neuron: directly, electrically, via ion channels, skipping the slower chemical neurotransmitter processes.

Back to *Britannica*:

**Electrical Transmission.** This method of transmitting nerve impulses, while far less common than chemical transmission, has been found in the nervous systems of invertebrates and lower vertebrates as well as *in the central nervous systems of some mammals*. Transmission takes place through so-called gap junctions, which are protein channels (ion channels) that *link the cellular contents of adjacent neurons*. Direct diffusion of ions through these *junctions* allows the action potential to be transmitted with *little or no delay and distortion, in effect synchronizing the*

response of an entire group of neurons. The channels often allow ions to diffuse in both directions... [*Encyclopedia Britannica*; 15<sup>th</sup> edition, 2005; Nerves and the Nervous system p 792]

And some fish can fly.

No, actually, this is very very good. If I was trying to make a cave painting of how consciousness works, I would draw an octopus's or human's central nervous system. Then I would link adjacent neurons so they could fire with no delay or distortion, in both directions, synchronizing the response of an entire group of neurons. And then I would draw a bird's nest of squiggly lines showing how, whether we are sleeping or awake, there are always a billion neurons firing in the brain.

And let's see. When I was done painting this synchronized neural network I think I would title it: **MIND!**

(And let's not forget that octopi are some of the smartest creatures in the sea. Much smarter than fish.)

OK...onward and upward. We've answered the "What's the first molecule to move" question. Now that I'm neck deep into this investigation that seems like a pretty arbitrary place to have begun. A better question would have been: what's the first "thing" to move to kick start the nervous system. What's the first thing to move in this physical world as a result of consciousness **impinging** on it? At what point does a thought

turn into action. Or better yet, how does no-thought turn into thought.

And of course we now know that the first “thing” to move is an electron in the electrical field, or electron cloud, swirling around a protein molecule in a sensory receptor cell. This is an important finding because anything from anywhere that can move those electrons can cause a nerve impulse to fire.

So what might do that? What might excite those electrons? We’re finally closing in on that.

Humans look for the causes of things. We will say: “I woke up this morning because a bird was chirping,” long before we will say, “I woke up this morning because a spontaneous electron cloud in my brain triggered a nerve that opened my eyes.” I’m not going to challenge that fundamental assumption of causality. But I *will* tell you this. The universe which *causes* the actions in our world is much much vaster than we have given it credit for. The simple fact that we don’t even know what an electron is or what energy is should tip us off that we are trying to paint a cave painting of the world with incomplete science. It’s like we’re trying to paint a picture of a horse using manure and forked sticks.

But back to what we know.

Close your eyes. Then, “when you feel like it”, open them.

When you open your eyes photoreceptors absorb photons that excite electrons that open ion channels that stimulate the action

potential that releases neurotransmitters and gets your visual and cognitive nervous systems up and running. That much we understand.

But what of the “inspiration”, the thought or decision, to open your eyes again – when you “felt like it”.

**How did your thoughts make those first electrons move?** The electrons that would stimulate your eye muscles to open? That’s where the rubber of consciousness hits the road. How did your thoughts make those first electrons move? Or are thoughts already electrons? And if so why haven’t we found them? Or have we?

Researchers claim there is a storm of electrical activity – a billion firing neurons – going on in the brain at all times. Even when we’re sleeping. Does this have something to do with exciting that first electron? And what about this business of linking the cellular contents of adjacent neurons, “**in effect synchronizing the response of an entire group of neurons**”. [*Encyclopedia Britannica*; 15<sup>th</sup> edition, 2005; Nerves and the Nervous system p 792]

Whadda ya think? Significantly for this inquiry, this activity is taking place at a quantum mechanical level. The level of single atoms...No, smaller yet...the level of single photons and single electrons being traded back and forth between atoms to alter their electrical charges.

According to physicist Freeman Dyson: Matter in quantum dynamics is not an inert substance but an active agent,

constantly making choices between alternative possibilities. ...It appears that mind, as manifested by the capacity to make choices, is to some extent inherent in every electron.

Is he kidding? He doesn't sound like much of a kidder to me.

But even if thoughts and decisions are somehow imbedded in, or carried by electrons, can one electron change an ion enough to fire a nerve? I'd say that's unlikely, or at best uncommon. A "threshold value" has to be reached to kick off an action potential. We would be slaves to quantum chaos if our decision-making was constantly being undermined by quantum level uncertainty and misbehavior. We'd be too erratic to survive. One electron probably can't fire a nerve most of the time. But can two electrons? Three? Twenty? Thoughts appear to be much less physically "there" than light or pressure, so maybe "thought sense receptors" are designed to require significantly less electrical input before they fire.

We're getting closer to finding out. And here are some researchers who should know. They're using thoughts to manufacture speech.

Putting Thoughts into Action:  
Implants Tap the Thinking Brain  
By Alan S. Brown

[*Scientific American Mind*; Alan S. Brown October 2008]

[Researchers are decoding the brain to give a voice and a hand to the paralyzed—and to learn how it controls our movements.]

Eight years ago, when Erik Ramsey was 16, a car accident triggered a brain stem stroke that left him paralyzed. Though fully conscious, Ramsey was completely paralyzed, essentially “locked in,” unable to move or talk. He could communicate only by moving his eyes up or down, thereby answering questions with a yes or a no.

In 2004 he met neurologist Philip R. Kennedy, chief scientist at Neural Signals in Duluth, Ga. Kennedy offered Ramsey the chance to take part in an unusual experiment. Surgeons would implant a high-tech device called a neural prosthesis into Ramsey’s brain, enabling him to communicate his thoughts to a computer that would translate them into spoken words.

Today Ramsey sports a small metal electrode in his brain. Its thin wires penetrate a fraction of an inch into his motor cortex, the part of the brain that controls movement, including the motion of his vocal muscles. *When Ramsey thinks of saying a sound, the implant captures the electrical firing of nearby neurons and transmits their impulses to a computer,* which decodes them and produces the sounds. So far Ramsey can only say a few simple vowels, but Kennedy believes that he will recover his full range of speech by 2010.

Ramsey's neural prosthesis ranks among the most sophisticated implanted devices that translate thoughts into actions. Such systems listen to the *brain's instructions for movement*—even when actual movement is no longer possible—and decode the signals for use in operating a computer or moving a robot. The technology needed for such implants, including powerful microprocessors, improved filters and longer-lasting batteries, has advanced rapidly in the past few years. Funding for such projects has also grown. The U.S. Department of Defense, for example, sponsors research in prosthetics for wounded war veterans.

Only nine people, Ramsey included, have received brain-implanted prostheses. In the past, patients have used them to spell words on a computer, pilot a wheelchair or flex a mechanical hand. Monkeys have employed them to perform more complex tasks such as maneuvering mechanical arms to grab food or controlling a walking robot on a treadmill...

Scientists have known for more than 220 years that *electricity somehow controls muscle movement*. In 1783 Italian physician Luigi Galvani, a contemporary of Benjamin Franklin, discovered that electric currents caused a severed pair of frog legs to twitch. By the 1860s German military doctors had discovered that small electric currents applied to the brain could cause certain muscles to contract. Over the following decades, dedicated researchers mapped which regions of the motor cortex control which groups of muscles in the body. But to discover how the brain actually orchestrates movement, scientists had to find a way to

eavesdrop on the neural signals in the motor cortex while animals were awake and moving...

Ramsey's implant connects with about 50 neurons in the part of his motor cortex that *translates how he thinks a syllable should sound into the muscle commands to make the syllable.* The implant captures the signals that control the coordinated motion of his mouth, lips and tongue to form sounds.

The link between Ramsey's neural implant and speech is a sophisticated computer program called Directions into Velocities of Articulators (DIVA), developed by Frank H. Guenther, a cognitive neuroscientist at Boston University. DIVA is *a mathematical description of how the brain controls speech, parsing the process into eight parts that represent different speech functions in the brain.*

Mathematical formulas define neural firing rates in each area and neuronal connections among areas. DIVA made it possible to build a neural decoder that can decipher the speech signals amid the neural noise coming out of Ramsey's implant. The *decoder translates the speech signals into sound data* that it sends to a speech synthesizer, which generates human sounds.

DIVA learns to speak from experience. Initially DIVA babbles like a human infant. As it "listens" to the resulting sounds and "senses" the position of its virtual muscles, it uses the feedback to modify its mathematical relationships to speak more clearly. "Then comes the imitation stage," Guenther says. "We have a human say something, and the

model tries to reproduce it. It will be wrong at first, but DIVA will use feedback to keep getting it closer. It usually takes about five or six attempts to get it right.”

Similarly, the neural decoder based on DIVA does not accurately translate Ramsey’s initial attempts to speak, in part because the computer program receives input from just a tiny fraction of the millions of neurons that are involved in speech. The program and Ramsey, however, get better with practice. Guenther starts this learning process by playing a sequence of vowel sounds on a computer—vowels are easier to pronounce than consonants—and *Ramsey sings along in his mind*. Ramsey and the decoder botched their first five attempts at each of the first three vowels. But then Ramsey adjusted his brain signals based on the feedback from the synthetic sounds the computer produced, and on the next five, he got three or more right.

“Ramsey was able to quickly improve his performance by *adjusting the brain signals* that were sent to the synthesis system,” Guenther recalls. “*Most of this learning is subconscious motor learning, like learning to shoot baskets or whistle or ride a bike, rather than requiring a conscious attempt to change the way one communicates.*” It is slow, arduous work. Ramsey has only enough energy for two or three weekly sessions that usually last no more than an hour or two...

From such endeavors, the neurologist hopes to change the lives of tens of thousands of people. Those who are now entombed within their own bodies will once again be able

to communicate and connect with friends, caretakers and family. People who cannot move from room to room or change a television on their own will find a new freedom. Wounded warriors returning from battle may receive artificial limbs that respond to their unspoken commands.

Wow! Stunning is the only word for this. When I first read it I thought, well, that blows my ruminations out of the water. These guys *do* understand what makes the first molecule move. But then I woke up in the middle of the night and said, wait a minute. They *still* haven't explained that.

What is happening is this: Ramsey *thinks* of a sound, and a neuron in his brain, somehow “associated” with that sound, fires an electrical pulse. But instead of that neuron sending the electrical signal through his damaged brain stem to try and make his vocal chords move, an “implant” registers the electrical pulse and sends its own electrical signal to a computer voice synthesizer to make the chosen sound. Again:

*When Ramsey thinks of saying a sound, the implant captures the electrical firing of nearby neurons and transmits their impulses to a computer,* which decodes them and produces the sounds.

Really amazing stuff. Great applied science. But we *still* don't know what makes the first electron move. How does the “thought” of making a sound excite electrons?

Hmmm.

Let's step back for a second. We don't even know what electricity itself is. We know what it does, or *seems* to do. Electricity seems to be caused by electrons bumping each other from atom to atom thereby creating a "current". But I have not yet met the electrician or electrical engineer who can tell me *what* electricity is or *why* it does what it does.

This article talks about Ramsey "thinking of making a sound" and "singing along in his mind" and "adjusting his brain signals" and "subconscious motor learning". Are these phenomena products of the movement of electricity in the brain? That electricity which we do not fundamentally understand? Made up of electrons which Robert Oppenheimer regarded as a "term of convenience." A label stuck on something we do not understand, the same as instinct or consciousness.

How does someone "sing along in his mind"?

No doubt there is a lot more good science that illuminates more of this process that hasn't survived the edit into this article. But our inquiry starts one important step back in time from all this. Back where Ramsey has *decided* to make an "o" sound. We are asking how the general made the decision to say, "Fire the cannon". Apparently the general also goes from "singing along in his mind" to "thinking of making a sound", and *then* a molecule moves? But have the electrons already started whirring when he is "singing along in his mind" and "thinking of making a sound?"

OK, let's break this down a little more. Sit back in your chair, close your eyes, and perform the following sequence at your own pace.

- 1) Think about moving your hand
- 2) Now...move your hand

When does the first electron move? We know it has already moved long before you actually move your hand. But has it already moved when you "think" about moving your hand? In other words are thoughts generated by electrons?

We don't know. We don't know because we don't actually know what a "thought" is any more than we know what an "electron" is. Once again, these things are identified by their "footprint" in our world, by discernible evidence of their existence, rather than by any deep knowledge of what they actually are.

For right now I am going to make a guess that the first molecule moves just after you "hear" the word "Now..." inside your head. By this point electrons are already excited and moving and at "now" they pass a threshold and trip the neuron action potential. But it's still unclear when the first electrons started moving.

"Now" has not been spoken out loud, and your eyes are closed, so you are not reading it at that moment, therefore we can eliminate those audio and video sense receptors in your ears and eyes that *could* be creating the movement of neurotransmitter molecules through synapses toward your brain. You have

arrived at “now” via a memory of what I asked you to do. And as we know, memories have not yet been found.

Yes, I’ve run us in another circle. I’ve painted the antlers and ears and hooves of an elk, but the body is still missing.

It’s time to cast a wider net.

## VIRTUAL PROCESSES

It is scientifically known that particles can appear in this world, live a brief life, and then magically disappear back into some other “dimension”. They are often described as matter/antimatter particle pairs, like an electron and positron, which split apart, live in this world, then re-find their mate and become so perfectly “balanced” once again, they completely disappear from our space/time back into “their” world. We call these matter/antimatter mates **virtual particles** and their antics of appearing and disappearing **virtual processes**.

What scientists believe is that our universe is made up of matter that “got separated” from its antimatter “mate” in the Big Bang. These particles, torn from their equilibrium of perfect massless balance, suddenly acquired mass and had to explode outward to make room for each other. They’ve been exploding outward ever since, and supposedly will keep doing so until they’re rejoined with their antimatter mate, and disappear back into their massless dimension. This dimension penetrates and permeates our universe. Says physicist David Bohm, “The **primary reality** is the “**quantum vacuum**”, the energy- and information-filled

plenum the underlies our universe and all universes. Bohm has called that perfectly balanced dimension the **Implicate Order**. Fred Alan Wolf calls it **Zero-Point Energy**. Both physicists believe there is as much *hidden* (balanced) energy in one cubic centimeter of the “empty space” in our world, as there is in the entire known universe. But that energy is, in a manner of speaking, “hidden between the lines” of our world.

Moreover, electron/positron pairs keep popping in and out of their hidden world into ours. I had trouble wrapping my head around this abstraction until Wolf said that all we have to do to experience it is to turn on our radio and set the dial between channels. The background static we hear is billions of electrons and positrons popping into, and out of, the zero-point energy world and our world. Amazing.

Earlier we wondered if one or two electrons run amok near a neuron could fire an action potential and disrupt our thinking, and here we can listen to billions of them running wild in our world.

Something else to understand about electrons. The electrons in our world do not travel in straight lines. They travel in zig-zags. The only good scientific explanation we have for this is that the electrons in our world, are continually interacting with electrons and positrons from the “hidden” world. Hidden positrons will attract them and hidden electrons will push them away. In this way we can be absolutely certain that electrons in our world are affected by electrons in another world.

So what?

So what is: electrons surround atoms and give them the charges that effect ion transfer – which spark nerve and brain activity. Therefore it is possible that “contact” with the hidden world, the quantum vacuum, can influence thought, memory, consciousness and decision-making in this world. And not just accidentally. It is possible, I say *possible*, that thought, memory, consciousness and decision-making *reside* in this hidden world of perfectly balanced energy. In other words, the hidden world doesn't just accidentally interact with ours. Maybe that's how thought, memory, consciousness and decision-making are designed to work in the first place. Maybe. Maybe that's where consciousness comes from in the first place. Maybe.

Maybe Ervin Lazlo is not crazy after all, and this is the mechanism for his Akashic field. The Knowledge Field. The Information Field. Or even the seat of our soul.

Simply put: perhaps consciousness has one foot in our brain and one foot in the quantum vacuum.

Cave painting. I know.

But I'm not the only cave painter wandering around out here.

Says Fred Wolf:

We know that in quantum physics, virtual processes are extremely important. An example of this is whenever light scatters from atoms or molecules, such as the everyday occurrence of sunlight scattering from air molecules and

producing the blue sky of the heavens. Here virtual electronic processes are involved.

Consider what the electrons in air molecules must do to accommodate this fact. It is fantastic. When light scatters from an atom, each atomic electron excites itself by literally absorbing energy from the light, even more energy than the light contains! Each electron also moves away from that atom in incremental steps from just a few atomic dimensions to an infinite distance all the way across the galaxy! Then each electron makes the long journey back to where it started, again in incremental steps, giving back all the energy that it had absorbed from the light. In the end, the debt of energy is paid back and the light is re-emitted in a different direction from whence it came.

All of this takes place in literally no time at all as a virtual or *imaginary* process. It appears to the outside world that a particle of light has simply scattered from the atom with no change in energy at all and no obvious escape of electrons from the atom. Yet without all that going on, it is impossible to account for the scattering pattern of light observed when light interacts with any atoms or molecules. In other words, the sky is blue because electrons take virtual journeys to heaven and back! So do we in the process of reincarnation, but I'm getting ahead of my story. [Fred Alan Wolf; *The Spiritual Universe* p 14]

Obviously that last sentence is mushroom cloud. Fred has blown up everything he's been saying, science-wise. I thought you should know.

For the record "Why the sky is blue" is usually explained as: while the longer wavelengths of red and yellow pass right through the atmosphere, the shorter wavelengths of blue light crash into air molecules. **These molecules absorb the energy from the blue light and then reemit that same amount of energy in different directions, causing the blue hue.**

I have found nothing *yet* to verify what Wolf said about these electrons moving "all the way across the galaxy" and back in virtually no time at all, but I'll keep looking, because if he's right then perhaps I'm right. The consensus seems to be that the electrons go somewhere, but we don't know where that is yet. However, even if Fred's wrong that doesn't mean I am. His speculations are just more cave wall paintings of the same herd of ideas. More meat for our mental stew.

We have evidence that electrons and positrons can be "entangled" across great distances of space, and that they can communicate faster than the speed of light. That is, they can communicate "outside of time". We have evidence that virtual electrons and positrons in their hidden world influence the paths of electrons in our world. And, we know that excited electrons "fire" nerve impulses, both in our brains and elsewhere in our bodies.

Does that mean the hidden world has some kind of “contact” with the neurological components of our consciousness: our thoughts, our memories, or even our decisions? I think it does.

Does that mean the hidden world has some kind of intercourse – two-way communication – with our consciousness? I think it *might*. Since we haven’t been able to find thoughts, instincts, memories, consciousness, mind or free will inside our brains, maybe it’s time to look outside.

Obviously, if we can find evidence of these things outside our brains, entire new worlds of human “biology” and “physics” open up to us. It is claimed we only use one tenth of our brain. But maybe the other nine tenths are hooked into the virtual world, the quantum vacuum, the Akashic Field, the Implicate Order, zero-point energy, the Knowledge Field, the seat of our soul. Lots of cave paintings of the same animal here.

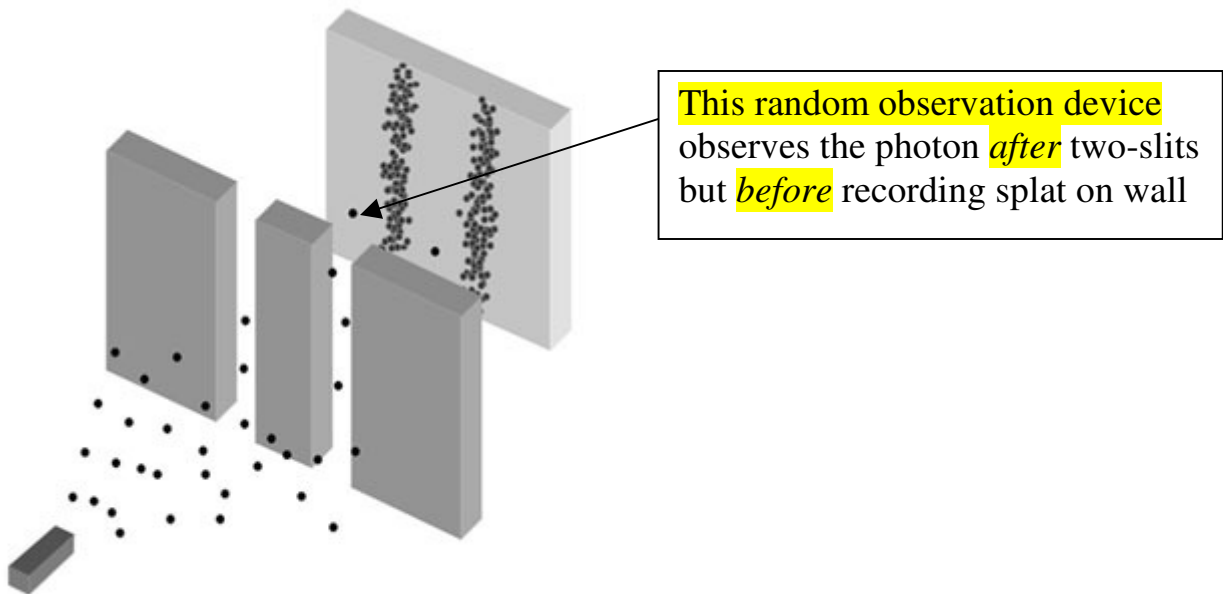
The brain might only be a gland evolved to process, interpret, “redraw” and interact with quantum level events on a macro level. Nothing more, nothing less. Rocks and water can’t do it. Birds and people can.

## SEEING THE FUTURE

Fortunately, we actually *do* have evidence for how quantum level events influence macro events. Let’s revisit the two-slit experiment. From it we learned that when a photon is being observed it is a particle, but when it is not being observed it is a wave. Moreover, when scientists are merely *intending* to

observe the photon, the photon is a particle. That's pretty strange. How does it know what some lab coat nerds *intend* to do?

Anyway, in order to remove *intent* from the experiment, scientists set up random event generators to “decide”, randomly, unpredictably, whether to observe or not. That way no one in the room could possibly know whether or not the photon was going to be observed or not.



Let's review the set-up. We have photons being shot toward a wall with two parallel slits cut in it. Some distance behind the wall with two slits, is a solid wall, with no slits, which is where the photons splat, and make black dots. If the photons are behaving as particles, (being observed), the far wall gets a splatter pattern of black dots in two sharp lines delineated by the two slits. If the photons are behaving as waves, (being

unobserved), the wall will be splattered with waves of lighter and darker stripes – classic wave patterns.

Now...if we target the observation device to detect photons *between* the two walls we will be observing the photons after they have passed through the two slits – which means *after* they have made their “*choice*” to behave either as a particles or waves – but *before* that decision has been recorded by the splatters on the second wall. Statistically, in a commonsense universe, there is only a 50/50 chance of the photons getting this right. How could they be making the choice of whether to be a particle or wave *before* the random event generator has even *decided* whether to observe them or not.

But the result is not 50/50. The photons get it right, particle or wave, *every single time*.

How?

By seeing into the future.

That’s the only way it could happen.

Photons, electrons, subatomic quantum level particles can “see” into the future. How far? That’s a mystery, but it must have some upper limit. If they could see infinitely far into the future then of course there would be no choice or free will, except in so far as probable choices might occur in different multiverses. But I want to skip over those multiverse speculations for now to continue making my point about how quantum level events affect macro level events.

Researcher Benjamin Libet showed experimentally that our mind works faster than our brain. For instance, if you put your finger on a hot stove, ion channels in your finger go wild sending nerve impulses to your brain telling it about this crisis, so that the brain can send a signal to the finger telling it to move quick. At least that's what standard models of the nervous system told us would happen. But it doesn't happen like that.

When your finger touches something hot a crisis signal does leave for the brain. But *before* that signal even gets to the brain a signal *leaves* the brain telling the finger to move. This sounds preposterous, ridiculous, bogus – until you eliminate time. Actually until your mind eliminates time. Your mind sees a fraction of a second into the future – like the photon in the two-slit experiment. Just far enough to know that your finger is going to touch a hot stove. “My oh my. This is bad. This is shitty. Don't sit around whistling Dixie. Send the signal to move the finger *now!*”

And where is this “mind” located that sees into the future and makes this decision – perhaps as much as a hundred times a day for each one of us? I don't see how any case at all could be made for it being located “in” the brain. The “brain” doesn't even know what's happening yet. The “mind” that has seen into the future is “outside of the quantum mathematical model.” It's “offshore” living a covert existence in a hidden world, yet influencing events in *this* world. Or at least that's what I surmise.

Does the brain of the photon in the two-slit experiment see the future? The photon doesn't have a brain! Something else is at work here. Some "other" way of knowing.

And how do I represent this in my cave painting? I don't know.

Let's be really clear about one of the main limitations of the situation. Our mind sees into a future that **must** occur. It cannot see into the future and then stop your finger from touching the hot stove in the first place. That would be "unfair" to physical reality. Actually I don't mean unfair, though that gives a good flavor for what's at stake here. In a universe where choice reigns and probabilities abound, our mind can only see into a future that actually happens. A future that is confirmed by our choices. To touch or not to touch. If we choose to touch the stove the future of that choice is "ouch, move your finger, fool. Why wait? Act now." And while the physical alarm signal resulting from the choice is still traveling to the brain, the mind is acting by sending the relief command signal immediately. Very literally: **ahead of time.**

So time is slippery. Both in two-slit electrons, and neurons in our own bodies. Dreaming offers more clues about the slipperiness of time.

## DREAMING

Here's a common description of a near death experience:

The first thing is a tremendous feeling of peace, like nothing else you have ever experienced. A peace that passes all understanding. Then there is a sense of being outside of the body. Some people report 360 degree panoramic vision combined with extraordinary acuity. They feel a sense of motion as if they are being propelled. [*The Dreaming Universe*; Fred Alan Wolf; Simon and Schuster 1994; p 251]

I have no control over my dreaming. I don't know what it's like for you, but my dreams come out of nowhere. Ninety per cent of the time they're not about people I know, or activities I have ever engaged in, or even care about. I'm frequently either confused or humiliated or frightened by things that have no counterparts in my waking life. Why, on a nightly basis, must I endure these completely nonsensical scenarios in strange places with strange people who mean nothing to me? Where does this crap come from? How can it possibly be "inside my head", when it was *never* ever inside my head before? None of my sense organs ever grabbed these images and sounds from the physical world and brought them into my brain before.

Dreaming is probably my most personally convincing evidence for the idea that my "mind" exists partly, or mostly, outside my body. One might be able to make the case that instinct is inherited knowledge that is embedded in our brain cells somehow. But I don't see how that could be said about dreaming. Not only is it *not* inherited; it's not anything I have ever seen before in real life, or even on TV. During deep sleep, at a time when my mind is at its most vulnerable – when it is

unable to be directed by my exercise of will – there appear from nowhere, images of things I know nothing about.

Why?

My dreamtime images have form, though usually very little in the way of color. And oddly, these images *never* come into view when I'm awake, even if I close my eyes and try to imagine them. When I close my eyes I see only the inside of my eyelids: black background with red and white dots. When someone says, "picture an apple", I still see only this black background with red and white dots, though I do begin to "imagine" or "remember" the shape and color and stem of an apple. But no picture of an apple *appears* in my mind/brain. Not when I'm awake. Only when I'm dreaming (or actually looking at an apple in real life.)

Why *can't* I bring up an actual picture of an apple inside my head? I know what I want my mind to do. I know what an apple looks like. I've painted paintings of apples. So, go ahead mind of mine, make a picture of one! What's so difficult about that?...But it won't do it. It'll do it in a dream, but not when I *will* it to do it? Why not? That doesn't make any sense. We already know that dreaming is involuntary and not controllable, but the fact that we can't reproduce dream imagery while awake is really problematic for understanding dreams. And for understanding being awake too I guess.

So if dream images appear spontaneously in our minds while we're sleeping, but won't appear in our minds at all when we're

awake, or even when we *will* them to appear, what's going on? Where are the images coming from?

Dunno. Quantum vacuum? Or what?

What's more, **I have no choice in my dreams**. This is really maddening. In fact, as soon as I choose something I wake up. The female sex goddess can flirt with me shamelessly, but as soon as I make a grab for her ass I wake up. "Damn! I shouldn't have made that grab!"...Dreams are more like movies than real life. We don't have free will or choice in movies, and we don't have them in dreams. Why not? That's very very strange and might even put the kibosh to the multiverse speculations. As soon as I choose something in a dream blam! I'm back in the real world. The one world.

Dreamtime images have no connection to optic nerves or sensory receptor cells. It appears they are produced without any physical sensory stimulus. Unlike with sight, touch, smell, taste or hearing, the first electrons to move during dreaming are not associated with sensory receptors attached to neurons leading into the brain. So which are the first electrons to move when we dream? Where are they? And *why* do they move?

Is their movement the result of spontaneous electron storms in the brain? Renegade electrons disrupting ion pumps, firing neurons randomly? If so why would dreams form up around previously unseen images and suppressed feelings?

Is it possible that dream creation is affected by the activity of quantum level virtual particles? *Virtual processes* as Fred Wolf

calls them? I see no reason that couldn't be true. Indeed, since it is almost certain that dreams are not set off by sensory stimulus, the idea that they are set off by separated pairs of entangled particles operating outside of Time is probably as likely than anything else. This seems to be an area where cave paintings could be dispensed with and real scientific experiments could be designed and executed. How do virtual quantum particles influence brain activity?

As I've said, far and away most of my dreamtime images are people or places or situations that are not familiar to me. For instance, it seems to me that at least one time in sixty years I should have been able to have sex with a movie starlet in one of my dreams. Why hasn't that ever happened? I certainly *want* it to happen. Instead all I ever get is fumbling attempts at feeling up mousy faceless women, and then I wake up as soon as I get to first base. What's that about? Is this a conspiracy? Is this some kind of insidious systemic dream-world probability wave collapse – perhaps because sex is more physical than imagery? But why would that matter?

To answer my own question: Yes, I think there is a dream-systems breakdown. I think dreaming is inadequate for construing events in the real world. I don't think dreams are *supposed* to imitate real-world events. My personal evidence for that is: as soon as I get my hands on the naked buns of a starlet I “fall” awake and my eyes pop open like a groggy crocodile, groaning and snapping at branches. Arrgh!

But if not from the real world, where do dreams come from?

Dream Fields? Zero-Point energy fields? The quantum vacuum?  
Other dimensions of space/time?

I haven't talked much about other dimensions so far. I haven't wanted to get this scientific idea confused with hippy trippy time travel, and the like. But it seems quantum theory has two basic interpretations. One is the old view that every event must be observed, or else it never happens. A potential event remains a quantum probability wave, until somebody sees it. An observer must "choose" to observe, and then the thing can happen.

Well...Does the bear shit in the woods? Or not. Personally I think he does. So if not us, who's watching him? The bear himself? Why not? He's conscious. And if his mind is connected to, or even made up of, virtual particles from zero-point energy fields, his consciousness can definitely claim to be mathematically "outside" the system being observed. Even though his body remains inside it, his mind is *outside* it. Which is pretty much what I said about Schrödinger's cat. The cat's brain, connected by "electron interference" with zero-point energy particles gives him a vantage point to observe...what?...whether he's alive or dead? Is this stupid or what? It's obvious he knows whether he's alive or dead.

The other fashionable possibility allowed by quantum theory, is the many worlds hypothesis. M theory. Multiverses.

It turns out that one way to get rid of the observer in the experiment – that is, to avoid collapsing the probability wave – is to claim that any time a "decision" is made that precipitates an event of any kind, *another entire universe* is spawned in which

the *opposite* decision and the *opposite* event are enacted. So *both* probabilities continue to exist. Sound tricky? I agree. Something really smells about this one.

Am I to believe that every time I turn right, another universe is born in which I turn left? (See how important free choice remains in this hypothesis as well.) That would mean, of course, that the number of universes is uncountable. Which might be true. But why would so many of them be propagated from this universe of ours? Every time a drunk weaves down a street jerking his wheel right or left new worlds are born? Come on.

Personally I would like to believe there is a universe where John F. Kennedy was never assassinated and the Vietnam War never escalated and I never dropped out of the University of Chicago and I married my high school sweetheart and became an honest politician in Chicago. Ha ha ha. What a fantasy world that would be!

Also, there'd be a trillion trillion trillion trillion universes where that didn't happen. Like maybe in one I'd be sharing a prison cell with Karl Rove. Me for assassinating Rush Limbaugh. Him for masterminding the Anthrax scare after 9/11 to propel us into the Iraq War.

And by the way... does this mean that every time I decide *not* to assassinate Rush Limbaugh, another universe is born in which I *do* decide to assassinate him? In that case: I will not assassinate Rush, I will not assassinate Rush, I will not assassinate Rush, I will not assassinate Rush, I will not assassinate Rush, *ibid, ibid, ibid*, not, not, not...

Or in another universe I might have been a bomber pilot shot down over Vietnam and I got conked on the head and came to believe I was a yeti and never came out of the jungle again except to steal rice and chickens from Vietnamese peasants.

Or maybe in another universe I'm...you get the picture. The quantum multiverse is a pretty goofy description of the universe. Keeping in mind that I am someone who *believes* there are other hidden worlds *galore*. Just not *this* kind. And anyway, if you want goofy you can pretty much leave that up to artists. You don't need to get a PhD in science for that.

In order to solve the quantum dilemma of the "observer" I think we are much better off spending our time looking for "offshore" consciousness spawned from our world, rather than looking for hidden universes based on quirks of free will. And I'm even a guy who believes in free will. So I should be titillated and encouraged by these multiverse speculations. But I'm not. Something's fishy. I don't *believe* in them.

So let's talk about Belief.

## RELIGION

Religion is the temple of free will – Rich Zubaty

Birds and beavers have consciousness, but they do not have religion. Take my word for it. No don't. Actually birds and beavers probably *do* have some kind of religion, but until they

start building churches that are bigger than their own houses we can assume that their reliance on religion is a lot less than ours.

So why this compulsion for religious belief in humans?

Because **the rock upon which religion is built is the belief in free will**. The idea that no matter what has transpired so far in your life, you can change everything, right this moment, by surrendering to Jesus. Or submitting to Allah. Or following the Tao. Or worshipping Krishna. Or becoming the Great Eagle. Or controlling your mind. Religion is all about choice. Choosing to override instinct. Choosing to act differently.

Religion is the thing that massively separates human beings from other animals. We worship choice. We build temples to free will.

And here's what makes me feel like my head is screwed on backwards. In the Nature versus Nurture debate I'm a Nature guy, not a Nurture guy. I believe that Nature almost always rules over Nurture. Which is sorta like saying there is no free will. That biology rules.

At the same time, it's also my belief, that **we acquire free will through nature rather than nurture. Free will is inherited rather than learned.**

Yes, this is an odd notion, a backward-facing belief, and maybe even an original way of looking at a scientific idea: the scientific idea expressed by Fred Wolf when he said: ***Every act we***

*perform is a choice, even if we are unaware that we have made a choice.* So stay with me here.

To me, free will is closer to instinct than it is to learning. By that I mean that the free exercise of will is embedded in our elemental animal natures. The universe is founded upon choice. Our species, like every species, requires the exercise of free will to survive. Like the deer reacting to the forest fire. Once we think of “deer” as meaning all deer, or of every “human” as a cell in the body of humanity, it seems pretty obvious that the more different choices we make – the more that quantum level uncertainty and variety percolate up to the macro level of existence – the more likely we are to survive catastrophes. For, though some deer burn up in the forest fire, others survive. And though some humans perish in a holocaust, others, who made different choices, survive.

In two paragraphs I just collapsed the starting point of this entire article. Namely, that free will is the opposite of instinct. Conceptually they seem to be opposites. But just as we inherit the natural impulses to breath air, and suck mom’s tit, and smash spiders, we inherit the natural ability to choose. Choosing is as natural as breathing.

We must pause here to note that education, from day one, seems determined to squash choice and replace it with societally approved formulas. Sit here, shut up, pay attention, don’t play with toy soldiers inside your desk. These are the vowel sounds, this is how you multiply, we live in a democracy, we have the freedom to choose our government. How insidious. They teach us we have free choice in the very moment they confiscate our

free choice. No wonder we're so confused. No wonder my head is facing backwards.

I'm not saying that education is useless, but I am saying it is turning us into sheeple in the same moment it is drilling us with the idea we have free choice. Pretty insidious.

"But I don't want to think about that now," says Scarlet O'Hara. "I'll think about it later."

Humans, are the only animals who have built Cathedrals to free choice. How come?

Because human society is so much more complicated than animal society. Or at least humans seem to be faced with so many more choices. A beaver will decide to build his home on this stream or that one. But never on the 47<sup>th</sup> floor of a New York City high-rise. Like my daughter. She grew up in Hawaii and Florida and considers living in New York City working seventy hours a week a reasonable life choice. Go figure.

I'd rather be dragged by my heels through shark-infested waters.

Church gives us choice. The choice to choose *them*, or burn in hell. See what I mean? They *know* we have choice, and they are doing their utmost to commandeer it. And it's too bad. Because at the heart of every religion we find the same beautiful message: surrender your ego and discover cosmic peace. Dissolve your *self* in God, as the Sufi's put it. Use your free will to annihilate your will.

I did it. For 39 years I ran on self-will run riot. Then I crashed and burned, and then I finally gave up my relentless striving to *become*. I gave up my willfulness. And in the moment I surpassed my fear of “turning into a vegetable” by surrendering my will, I immediately discovered I had more choices open to me than I had ever before imagined. Overnight the entire world opened up to me.

I could stay where I was or fly to Zimbabwe. So I flew to Singapore and then India. I could paint houses or write a book. So I wrote a book. I could fall in love or not. I chose not.

The elemental feature of a life well-lived is free will exercised by a selfless self. The more selfless you are the more choice you have. The less you cling to earthly formulas of success, the more freedom you have.

This is what religions are supposed to teach. But as church values have declined our lives have become increasingly defined by corporations. If we are not working or consuming we are dying – just taking up valuable space – according to the corporate ethos. In America our only measure of wealth is Gross Domestic Product, or basically how much money you make. In France they factor in health care, housing, quality of food, education, cultural opportunities, and absence of war – as well as how much money you make. How about that? We use the economic fuel we burn on war to measure how wealthy we are, and they use the economic and human waste of war to measure how poor they are. We’ve been here 200 years and France has been there over 2000. Go figure.

Americans are waiting for schools and churches and corporations and governments to tell them when they can be free, and guess what? They *never* will. You'll never be free on corporate time. The main function of school and church has become training us to be compliant corporate employees.

We have to realize we are all free *all* the time. No one need give us permission to be free. We can do whatever we want, as long as we accept the consequences. You can run a red light, as long as you're ready to die in a crash, or get a ticket from a cop. Running red lights is not a good arena for expressing freedom.

However, you can quit your shitty job and sell your stupid house and do whatever you want to do wherever you want to do it. And if you don't like that, you can go do something else. The prisons we keep ourselves in ruin, not only our *own* lives, but everyone else's. I'm sick to death of living in a country where people are obsessed with ownership of property. Who gives a fuck about owning a house? People work themselves into a frenzy running the price of housing through the roof, and mortgaging all of us to banks forever. What a stupid society. What a stupid way to live. What a shameful lack of inventive ideas.

If I was Emperor of America I would make everyone, I mean *everyone*, produce twenty hours of original art work every month. That way artists like me wouldn't have to live like bums because we cannot both make art, and compete with the mindless drones pumping up the price of real estate, and oil, and everything else. What a stupid country. There's no other country on earth like this. Third generation Americans competing for

economic scraps with Guatemalans who arrived here last week. What the hell do we need this money and education for if all we are is slaves to bankers?

Ugh...Sorry.

So much for the Temple of Free Will.

## ON SPIRIT AND SOUL

Says Fred Wolf:

Based on my research the spirit seems to be virtual vibrations of vacuum energy; the soul turns out to be reflections of those virtual vibrations in time; and the self is an illusion arising from reflections of the soul in matter, appearing as bodily senses as suggested by the Buddha. Hence the three are related but essentially different. [Fred Alan Wolf; *The Spiritual Universe* p 13]

Got that?

You *tell* me. Is this bullshit? Or is this guy onto something? Personally I think it's a bit of both. The same way I think about my own cave paintings in this part of the jungle. I don't know if by "research" he means magic mushroom "research", or what, but what he seems to be saying is something along the lines of:

"Spirit" is the movement (vibration) of particles in the zero-point energy world.

“Self” is an illusion – forgetting that we are actually all cells in the body of humanity – formed by our attachment to our senses.

“Soul” is the virtual particle messenger between the two, linking the spirit world to our bodily self, in time.

When we die our illusion of Self dies, and there is nothing for Soul to connect to, so it returns back to Spirit. Or something like that.

Spirit, Self, and Soul are “loaded” words with various historically overlapping meanings, so I don’t want to rely on them.

It’s enough to say that for thousands of years men have been trying to describe this interface between physical and non-physical worlds. And though we don’t have it “right” yet, we’ve said the *same* thing so many different times in so many different ways using so many different words there *might* actually be some truth to it.

Let’s fire up a little Socratic dialog and see where it takes us:

Consciousness exists.

Choice exists.

Something “leaves” our body when we die.

In death we lose the ability to choose.

We are no longer conscious.

That's about all we really know.

In death our personal universe ceases to exist because we have no more choice and no more consciousness.

For other universes to continue to exist they must preserve choice and consciousness.

When our universe goes away do all universes go away?

Unlikely. There must be more than one observer for there to be objective reality.

Is there objective reality?

Yes.

Is it possible that consciousness and choice are "stored" somewhere outside of our universe? Like maybe "parked" in the zero-point energy field.

Yes, possible.

Is it possible our consciousness and choice fit together like matter and antimatter? Electron and positron?

I'm not sure what that means.

Guess.

It means that though consciousness and choice seem to exist separately, they might be like entangled particles.

Oh yeah?

Yeah, when one undergoes a “state change”, so does the other. Instantly.

Like how?

When choice dies consciousness changes. It panics. It’s imbalanced, like a virtual electron split from its positron, running around this world bumping into things trying to rejoin it.

Then what?

Maybe it rejoins the Collective Unconscious, the Supreme Consciousness. Or maybe it slaps together another one of us 70-year organic robots to re-implant its consciousness.

That’s what they call reincarnation?

Yeah, but the jury’s still out on that. Maybe something else happens.

What?

Dunno. Maybe consciousness hooks up with different “particles” in the zero-point energy field and accretes some new form into our world. Or another world.

Like what?

Dunno.

Like a swallow?

Maybe a swallow.

Good. I’ve always wanted to be a swallow.

Or a trilobite.

A trilobite?

A trilobite in a different galaxy with no light and poisonous gas in the sky.

Ugh. Could that really happen?

We are surrounded and suffused by an invisible ocean of energy. If that can happen almost anything could happen.

We sure expend a lot of food energy and sex energy assembling and maintaining these 70-year organic robots of consciousness and choice. Why bother?

That’s what the universe wants to happen.

Why?

We don't know.

Guess.

Because consciousness begets consciousness. Consciousness is ever choosing, ever experimenting with new forms to beget more and more consciousness, from amoebas to birds to humans...to what next?

The *purpose* of evolution is to evolve ever more consciousness.

The purpose of evolution is to evolve ever more consciousness.

## QUANTUM CONSCIOUSNESS

Surprisingly it is quantum indeterminacy that leads to the deterministic choices on the normal level of perceived experience. If this indeterminacy was to vanish somehow, my will would not be done. I would have no choice. None at all. [*Taking the Quantum Leap* Fred Wolf P229]

Quantum mechanics is necessary for life as we know it. Out of uncertainty comes freedom. From the uncertain atom comes free will...If (cellular atomic quantum uncertainty events) did not occur as they do, free will would vanish. We would become total

machines...behaving much like thermostat-controlled house heaters. [*Taking the Quantum Leap* Fred Wolf p238]

OK, I've just sat in a cold wet grotto for a couple hundred hours making a cave painting of what *might* activate free will and explain consciousness. The painting is, without question, a sloppy mess. Broken antlers, split hooves and twisted tails. Squiggly lightning, hallucinatory campfires and stern, scornful mastodons. But maybe, ten thousand years from now, somebody will look at it and say, "Well, look at that won't cha. At least they were trying." Maybe.

My basic idea is that distinct and measurable parts of our mind and consciousness are linked to the hidden world of zero-point energy via the action of virtual particles on quantum-sized particles in this world.

In other words, consciousness has one foot in our brain and one foot in the quantum vacuum.

Got that?

What I'm saying is: an ocean of hidden energy stimulates the neurons in our brain in a way that is not only *not* accidental, but which is actually some feature of consciousness that is exemplified by choice and free will.

I'm not just saying that yes, there is free will. I'm saying, that according to quantum physics, everything living creatures *do* is an expression of free will. Everything. Every time we *choose* to

observe anything, we collapse probability waves and bring more physical particles and more consciousness into our universe.

Consciousness begets consciousness.

Maybe I'm wrong. But it's a hypothesis worth stating. And a mindscape worthy of scientific investigation. Einstein designated quantum units of energy so he could plug them into equations. Why not designate quantum units of consciousness and plug them into some equations. Yeah, we don't know what consciousness is, but we still don't know what energy is either! The mere inconvenience of not knowing what something is has never stopped mathematicians before. Why stop now? Let's begin the search for Quantum Consciousness.

But even if I'm wrong about the link between consciousness and the quantum vacuum, that doesn't negate free will. Insofar as free will goes, our world appears to be built upon the quantum scientific presumption that without choice there is no universe for us to inhabit.

We are because we choose.

Martin Gardner went so far as to say: "Free will, in my opinion, is another name for self-awareness or consciousness." [*The night is large : collected essays, 1938-1995 / Martin Gardner* by Gardner, Martin, 1914- ; New York : St. Martin's Press, 1996. p427]

That's pretty good. Choice equals consciousness. Consciousness equals choice. When you're dead you have no consciousness

and no choice. See how that lines up. That's pretty succinct. That's Occam's razor, the scientific preference for the notion that the simple solution is the best solution.

Consciousness = Choice

I'd like to see some mathematician plug that into his calculations and run with it.

Consciousness = Choice

I choose therefore I am.

.....

## GLOSSARY:

**Ion:** atom or group of atoms that gains an electrical charge by losing or acquiring electrons.

**Virtual particle:** matter that has temporarily popped into our world from the zero-point energy field.

**Electron:** negatively charged "particle". Electrons take a zig-zagging course through our world because they are constantly being interfered with by hidden energy in the zero-point energy field.

**Positron:** electron made of anti-matter

**Zero-point energy field:** massive amount of energy held by matter and antimatter in such perfect balance that these particles and this energy is not detectable in our world, *except* when virtual particles split apart into matter and antimatter, like electron and positron, and make a sprint through our world. Which can last for a billionth of a second, up to 13.7 billion years and counting. This world of hidden energy, called the Implicate Order by David Bohm, is thought by some to be the “ground of creation” since it is theorized that any one centimeter of empty space in our world holds as much hidden “virtual” energy as there is in the entire known universe.

.....

Loose UNUSED notes

Bohm: particle behavior is weird and indeterministic only at the surface. At a deeper level it is determined by the quantum potential “Q”, which emerges from the implicate order – a holofield where all the states of the quantum are permanently coded, for this universe at least.

Fred Wolf, *Dreaming Universe*:

The thinking is that quantum level informational “prompts” steer evolution toward workable forms.

Nobody knows how a quantum probability wave form collapses and a single event actually occurs. Nobody’s ever seen it happen.

“glial cells” may do more than just provide nourishment for neurons. They may act as a medium for holographic waves as in Nobili’s model. Wolf, *Dreaming Universe* P 303

**Glial cell:** A supportive cell in the central nervous system -- the brain and spinal cord. Glial cells do not conduct electrical impulses (as opposed to neurons, which do). The glial cells surround neurons and provide support for them and insulation between them. Glial cells are capable of extensive signaling in response to a diversity of stimuli. Bidirectional communication exists between glial cells and neurons, and between glial cells and vascular cells.

Even though the brain only makes up 2% of the body's weight, it contains 25% of its cholesterol.<sup>4</sup>

Cholesterol is a central building block of the connections within our brain that hold these memories and learning processes together. Remember that... thanks to cholesterol, you can!

Glia, in fact, are busy multitaskers, guiding the brain’s development and sustaining it throughout our lives. Glia also listen carefully to their neighbors, and they speak in a chemical language of their own. Scientists do not yet understand that language, but experiments suggest that it is part of the neurological conversation that takes place as we learn and form new memories. [What experiments?]

Our brains do not behave sequentially like computers. Their operation is more holographic where every part contains an image of the whole.

Some *believe* that glial cells surrounding neurons are where memories are stored. [Look for evidence.]

And once radial glia are finished helping neurons move around the developing brain, they don't die. They turn into another kind of glia, called astrocytes.

If the glial cells called astrocytes really do process information, that would be a major addition to the brain's computing power. Astrocytes—named for their starlike rays, which reach out in all directions—are the most abundant of all glial cells and therefore the most abundant of all the cells in the brain. They are also the most mysterious. A single astrocyte can wrap its rays around more than a million synapses. Astrocytes also fuse to each other, building channels through which molecules can shuttle from cell to cell.

If astrocytes really do process information, that would be a major addition to the brain's computing power. After all, there are many more astrocytes in the brain than there are neurons. Perhaps, some scientists have speculated, astrocytes carry out their own computing. Instead of the digital code of voltage spikes that neurons use, astrocytes may act more like an analog network, encoding information in slowly rising and falling waves of calcium. In his new book, *The Root of Thought*, neuroscientist Andrew Koob suggests that conversations among astrocytes may be responsible for “our creative and imaginative existence as human beings.”

The brain has 110 billion neurons knit together with 100 trillion synaptic connections. It is claimed that the number of synapses is more than all the atoms in the universe. But this can't be right. How can a synapse be smaller than the atomically formed proteins that move between them? Or are they counting the neuron-to-neuron synapse-less connections???