The Final Final Theory?
A Review of Mark McCutcheon's The Final Theory: Rethinking Our Scientific Legacy

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I have been reading through Mark McCutcheon's **The Final Theory** (FT). This prophetic-sounding title may attract a number of people to read his thought-provoking book, so I decided to write a review to assist readers in evaluating Mr. McCutcheon's ideas and to use the opportunity to further explore and unfold some of my own thoughts on these matters. In the course of this review I will often refer to aspects of Standard Theory (ST) and some other current "nonstandard" approaches, such as Palmer's **Avatar** system. I will also often refer to the principles of **Observer Physics** (OP), which is what I call my interpretation of how things work -- my personal Theory of Everything. If I seem at times strongly critical of Mr. McCutcheon's ideas, that is simply the role of a reviewer and is all in the spirit of constructive inquiry into how we can clarify for everyone, including ourselves, what is really going on. My comments may also encourage him to refine his ideas further.

(Also, in this article I will refer to Mr. McCutcheon as McC, no offense intended. I suppose we could read this abbreviation as "m-c-squared" or "Mac-See".)

McC's book interests me for two reasons. First, he brings up and attempts to explain a lot of major problems that modern physicists do not handle very well. FT includes an excellent checklist of touchy issues in physics compiled by McC, -- though it is by no means a complete list. Second, McC presents in his book a creative new theory that gives us a new viewpoint from which to study some of the core problems of physics. Creating a new viewpoint for studying a discipline can be a very useful exercise regardless of how well the theory shakes out in the end. For me it is helpful to refine and clarify the insights of OP, my pet theory of the universe. However, unlike McC, I do not propose to rewrite ST physics on the basis of a totally new principle or force. I work with what is already there, adding only a stronger emphasis on the role of the observer. My OP theory is simply that a careful study of consciousness -- something we all experience -- will add to our understanding of how the physical world works and contribute to solving some of the major issues that remain poorly understood.

In the last section of his book, McC attempts to interpret some of the Big Questions (such as the nature of subatomic particles, antimatter, mass-energy conversion, black holes, the Big Bang, the expanding universe, and the nature of time) in terms of his FT. Just for starters, here are some Big Questions for McC that he fails to address in his book but which beg for answers if we are to accept his FT.

* McC believes everything is made of electrons. If everything is made of electrons, what ARE electrons?
* Why do electrons exist and how are they made? Do they have structure?
* Why do they expand?

* Why do we call them fermions? McC does not explain bosons or their distinction from fermions.
* He mentions hydrogen when he explains his theory that electrons bounce in their orbits. How do electrons bounce in atoms with many electron shells? What do the various shells look like, and how do they behave chemically?
* Does McC mean by bounce that the electrons vibrate as they move in orbits? How is that different from the QM (quantum mechanical) explanation of ST?
* How is a proton or neutron built from electrons?
* Why do these particles exist in a 3D space?
* Where do his classical and subatomic spaces come from?
* If all photons are made from expanded/expanding electrons, how is this different from saying that all electrons are made from photons?

Modern physics teaches that all forms of matter and energy ultimately are made from photons. According to ST each particle can annihilate with its corresponding anti-particle and convert into photons. Of course, from a Unified Field Theory perspective we may have to expand our idea of photons to include bosons, such as W' s and Z' s and gravitons. How are the other bosons made from electrons? These various particles all come from an undefined field called for convenience the Vacuum State. Current theory believes that the universe somehow (??) starts with a Big Bang from a very hot, compacted, highly symmetrical "initial condition" (how did it get there?) that expands, cooling, and spontaneously (?) breaking its symmetry, until it unfolds to form our present physical world of atomic structures and galaxies. McC needs to at least match this ST with his FT in terms of precision. To be worthy of acceptance it should exceed the ST version and contribute some truly new ideas and discoveries..

The first "New Idea" that McC introduces in his book is what he calls the "Geometric Orbit Equation", which he writes as v^2 R = K, where v is velocity, R is distance separating the centers of two bodies, and K is a constant.) This equation derives from the work of Kepler.

I discuss this equation at length in my OP papers, so it is not his "new idea". That equation has certainly been around in the literature for a while, so I do not claim to have discovered it, nor do I know who came up with it first. Quite independent of McC' s work I have applied this well-known formula that McC calls a "Geometric Orbit Equation" in a creative new way to resolve the major problem astronomers are having with the rotational dynamics of galaxies. Current attempts to fit the observational data on galactic rotational dynamics to the ST (in this case Newton-Kepler Gravitational Law) seem to require huge amounts of invisible Dark Matter to make things work out. Milgrom has proposed an alternative approach that requires an ad hoc assumption with no theoretical grounds -- basically forcing the data to fit the formula. I prefer to only make assumptions based on reasonable theoretical analysis. (See **Observer Physics** and my paper on Dark Matter and rotational dynamics posted at dpedtech.com.) McC is right that Kepler' s principles and observational data clearly imply the equation. We can describe gravitational dynamics relying only on relative velocity and distance and do not need to know about any forces or masses. Therefore this is a proper equation of

Observer Physics. McC is right on here, and he is also correct to say that gravity is not really a force. But I do not think he has explained where gravity comes from with the expansion theory that he goes on to expound in his book. As far as I can tell he just proposes another mystery with this assertion, rather like Milgrom with his ad hoc assumption about changes in the laws of acceleration. So I ask McC: Why would everything want to expand? Since this is your primary thesis, at least take a shot at trying to answer this fundamental question. The discussion (pp. 365-369) of primordial particles generating virtual spheres that would naturally expand is not very convincing unless he can actually demonstrate such a model on a computer or mathematically. In fact his assertion that "all shapes become spherical as edges grow equally" just is not true from a mathematical perspective. When I expand a triangle in size by scaling all sides equally, it always remains a triangle so long as I stay in Euclidean space. Furthermore, all such triangles will be similar. It may be that a gas in space tends to form a sphere, barring other influences, but that is assuming the presence of gravity, which is what McC is trying to demonstrate as arising from the existence of some prior cause.

There actually is some evidence in QM that supports the notion that everything at the subatomic level is rapidly expanding. But unfortunately McC does not adduce this evidence in his theory. When we try to look at a QM Wave Packet at the subatomic scale, we find its position-momentum expands very rapidly. It fuzzes out on us. An electron wave packet balloons to the size of a football field in an instant. If everything ultimately is made of electrons that uncontrollably expand, then everything must be doing that. I wish McC would pursue that line of argument further to support his theory. I enjoyed his discussion of tidal forces and slingshot effects in the section on gravity. I also enjoyed seeing his calculation of an expansion velocity using earth and then using hydrogen. More quantification of his theory would be useful.

Also for a work that claims to be the Final Theory of physics McC does not mention many fundamental ideas in our current description of the world at our everyday scale. For example, he omits discussion of the important distinction between bosons (energy particles) and fermions (matter particles) that is fundamental to the vision of ST. He merely discusses briefly the famous Einstein conversion equation and tries to deny the conversion and call it simply kinetic energy. He simply ignores the obvious conversion interactions between bosons and fermions. Some kind of conversion goes on, because the two states of being behave differently.

McC also does not mention the major new paradigm of phase conjugation that has recently evolved out of quantum physics. On page 297 in FT he claims that two out-of-phase laser beams of identical frequency will not mutually interfere. He ignores the principles of coherent light, boson behavior, and the principle that in general interference can only occur when there is interaction involving waves and fermions (such as slits, grids, reflectors or a material medium.) Despite drawings in books you can not detect EM waves in space without a receiver. Under certain conditions bosons can behave like fermions and vice versa. But in general particles acting as bosons do not interfere with each other. They coexist and either fuse into a single particle or just pass right through each other unaffected. On the other hand, two beams of McC' s expanding electron

clusters, being fermions, would seem to disturb each other according to ST. McC never explains what his theory predicts. If particles behave like boson photons, call them photons instead of insisting that they are fermion electrons. That is forcing a unitary theory despite evidence to the contrary. McC says that the coinciding of two perfectly out-of-phase laser beams do not cancel out their respective light as wave theory might predict. Actually highly collimated, spatially-temporally coherent mutually aligned out-of-phase laser beams form a special phase conjugate 4-wave macroscopic quantum bubble in space. An outside observer sees nothing until the quantum bubble makes an interference pattern by scattering off an object. ST may not fully understand the subtle difference between bosons and fermions. I wonder how McC explains the difference.

Coherent optics and laser technology is a major field of physics. There is nothing in FT about Fourier transforms or holography. In holography we can call a beam that scatters off an object an object beam. A second laser beam (usually split from the same source with mirrors in order to get identical frequency) becomes a reference beam. We can record on a piece of film the interference pattern of the object beam scattering from the object and mixing with the reference beam. Shining the reference beam at a later time on the recorded interference pattern on the developed film reconstructs the original object beam as a reflection from the film. The reflected object beam displays the original light field of the object, and the object appears as a three dimensional virtual image. This phenomenon and all the other amazing aspects of phase conjugate physics -- including localized time reversal and holographic fractal coherence -- involve fundamental quantum physics that McC does not touch on in his FT, nor do I see how his theory would handle these phenomena. Yet technology based on this physics is rapidly permeating our society and transforming our life styles. FT must address the core physics principles underlying these phenomena in order to stand up as a theory.

McC' s idea of primordial particles just pushes the problem back another step. Who ordered the primordial particles (and their space)? We do not even know how they relate to the rest of the theory.

McC mentions that his whole scenario of expanding particles could be emulated on a computer, although he apparently has not done this. He says (p. 368), "So while we can conceive of the primordial realm either as a deliberate creation analogous to a designed computer simulation or as a simple and spontaneous physical process, the fact remains that the difference between these two alternatives may only be a matter of semantics." Here he is starting to go in the right direction. The semantics issue may also relate to the photon/electron egg/chicken question I posed above. The notion of making a simulation of course also supposes a metaverse behind the universe. It also shows us that, if we have the laws by which the universe operates, then we can write the universe up as a computer program. Not only is the program independent of the computer screen as it runs in the CPU and memory with the screen turned off, it is also independent of the computer. It even becomes media independent. Ultimately it becomes a set of beliefs (program statements) dreamed up by a programmer somewhere that he can run in his own MIND WITHOUT A COMPUTER -- as he certainly must do in order to write the program in the first place! McC believes that "we can only deduce *what* the primordial

realm does by arriving at an understanding of our universe of expanding electrons, but not precisely *how* or *why* it behaves so." Here he does a major cop out and begs the question of what really goes on behind the scenes. The result is that we are still left with a mystery wrapped in an enigma and packed in a conundrum.

Let us explore whether the difference between his two scenarios is or is not purely semantic. You can easily experience this difference for yourself. Let' s experiment. One choice is to create deliberately, and the other choice is to simply sit back and take it as it comes. You can try this experiment right now.

Make a deliberate choice to do something for about ten seconds. Then do it for about ten seconds. Do not get distracted keeping track of the time. Just estimate the time very roughly and stop whenever you deliberately decide to stop. Feel what the actualization of that deliberate choice feels like. Now sit back and just let things happen for about ten seconds. Feel what the actualization of that choice feels like.

Do you notice a difference? What is the difference? In the first case you deliberately chose an experience and then experienced it. In the second case you ALSO deliberately chose an experience and then experienced it. The only difference was that one choice was more proactive, and the other choice was more passive. In what we labeled the passive case you experienced stuff from your prior creations -- your state of mind, environment, your karma. In the active case you generated karma and made a new creation. So both cases are actually deliberate decisions. The difference is only one of attitude, or viewpoint, or what kind of judgment label we stick on it.

The subtle thing about the passive viewpoint is that it easily slips into another attitude that passes the responsibility for happening on to the prior creations. But, having usually forgotten the choices that got you into those creations, it is easy to start thinking that they came from somewhere else. He did it. She bothered me. The phone rang. Nature did it. God made it happen that way. God plays dice. The environment was just there. All kinds of other interesting excuses can come up to help us deny our deliberate decision to just coast along with the stuff we have already created in the past, whatever the past is. And the PAST also turns out to be a big piece of imagination to justify the situation we currently find ourselves in and the various judgements we have decided to place on it, good or bad or indifferent.

Can you find the PAST anywhere? Oh yeah. There is lots of evidence for it.... You see there was this BIG BANG, and then it expanded, and all sorts of stuff started to happen.... And Oh yeah, I had a bagel for breakfast...burp.

We see in the bio-engineers unlocking of DNA the same process of discovery that the physicist goes through. We find that this chemical molecule is actually a string of biological computer code. Once we understand the code, we can not only freely manipulate the code any way we like in its chemical format, but we can transport the code into computers or any other medium that we might imagine using, with any modifications we might like to try on. The medium may just be our own imaginative

minds. Is that just a simulation or is it a virtual reality, an alternate universe? The code itself consists merely of a series of statements. These are ideas, beliefs encoded in a specific linguistic format that can be freely translated and adapted once we understand the beliefs and the language in which they are expressed.

What so many scientists both inside and outside of the establishment somehow insist on not getting is that this discovery leads you right to the study of consciousness itself. What is consciousness? We can call it the process of creating beliefs (ideas, thoughts) and playing around with them. The ability to do this is an inherent property of pure awareness that we call the will. What is pure awareness? It is undefined. Every mathematical system starts with a couple of undefined things and builds from there. This is the clay from which you throw a pot. It willingly takes any shape you give it. The notion of willingly accepting also includes the notion of a will. Remember your experiment spending ten seconds just taking things as they came up. That is Awareness. The decision to deliberately do that is Will. Will is actually undefined just like Awareness. The only way we can identify it is through the experience of the creations that it creates. That does not show us what it is; only what it does. But the study of its operation is quite fascinating.

Therefore, rather than starting his Theory of Everything with a mysterious unexplained force called expansion Mr. McC would probably do better to start with a consideration of the nature and function of Aware Will and the various forms of consciousness that it creates. This can then lead to an understanding of why there might be expansion or Big Bangs or whatever the hypothesis turns out to be. In other words, once we account for a mechanism of experience, we can start to account for the experiences themselves. The educational psychologist Harry Palmer points out that, when we consider the nature of experience, what we experience AS may turn out to be a very interesting consideration. This ASness includes the observer/participant viewpoint, his medium of experience, and so on. Here is what Palmer says: "What you observe AS affects what you perceive as true. What you operate AS affects what you can do. Inconsistencies in observation and abilities arise as a result of differences in AS..."
(**Living Deliberately**, p.109, et al. This book by Palmer is available as a download at the web site www.avatarepc.com.)

Whatever we may say about the universe, the fact remains that all theories and experiments and other forms of experience rely on Awareness in some form or other, perhaps even unawareness. So we must first clarify how it is that we have any experience of a universe to explore. Then we can start to understand the principles of physics.

What evidence is there of expansion at the level of Aware Will? Undefined Awareness has no opinion and no definition or boundary, so it has nowhere to expand to, although, given an opportunity, it can certainly enjoy and accept the experience of expanding. We know that we can manipulate our attention with the Will. That is what the Will does. We can expand it, contract it, shift it, fixate it, free it, flip it back and forth, and so on. The Will functions as a phase wave and has no speed limit. I can shift my attention

from a cup of coffee to a galaxy millions of light years away in less than a second. Space and time hold no barriers for the will -- unless you exercise your will and create some barriers, like Einstein did with his arbitrary speed of light idea.

For The FT to work, McC needs to show convincingly how manipulation of attention can generate the apparent physical experience of forces such as gravity or electricity. For example, if we are floating in space near the earth, why would earth want to expand up to meet us -- or for that matter pull us toward it as ST supposes? Since the two results seem the same in relativistic space, it seems that McC is just switching vocabulary on us and not giving a real answer to this core question. Once we accept FT theory, then instead of wondering why objects attract each other we start to wonder why things expand toward each other. I am not sure that is a theory or even physics. It is just another way of asking the question and does not give us a real answer. In physics things expand when either matter or energy is added to them. For example, we can expand a balloon by pumping more air into it or simply by heating the air inside it. We must operate on the object from an outside source in order to make it expand -- that is, pump it or heat it. McC has everything expanding simply because he makes the assertion that things expand. Fine, but what is the payoff for Nature? Where does the energy to expand come from? Is he out there manning the pumps? How can he fault the ST for not saying where the energy of gravitational pull comes from when he can not explain where the energy of expansion comes from? It gets worse when, after convincing us that everything is expanding, McC later on suddenly turns about face and starts talking about things shrinking. That really confuses us. How can electrons shrink if they are always expanding? To justify this bizarre phenomenon, he gives us the same paradox of the microscopic world of QM and the macroscopic world of classical physics, each running by different rules. Quantum mechanics already confuse people with bizarre subatomic behavior that is so different from macroscopic behavior. Now we have another confusing theory with two mysterious worlds somehow mysteriously interacting and crossing over back and forth. How does that clear up anything?

On page 56 McC first introduces his new principle of expansion with reference to Edwin Abbott' s famous little book, **Flatland**, the tabletop world in which a 2-D figure tries to figure out what three-dimensional objects are like when it can only see their intersections with its 2-D space. Here McC is onto a very good starting point, but he misses the opportunity to get it right. After all, from the drawing he shows us we could discover contraction just as well as expansion, all for no particular reason.

In my way of thinking a better way to present his theory would be to explore what happens to the 3-D world when we PROJECT it onto the 2-D world. I suspect this can reveal the secret of how we experience the world. The experts in Hollywood and Silicon Valley figured this secret out a long time ago and have been busy selling it to us as entertainment without letting us in on the secret for fear that they will lose their financial grip on the economy and our minds. They have to stop the drug lords because those guys distract people from spending their good money on HW/SV attractions. Of course, we just let the HW/SV moguls sell us their bill of goods, and that is OK. But we really should pick up on how it all works. The technology is getting quite advanced

these days. Let us get up to date with where things really are at.

First let us consider a few aspects of MOVIE and VIDEO GAME TECHNOLOGY. To make a movie we simply aim a camera at a scene or event in the "Real World" -- the stuff that physicists try to explain to us -- and press the RECORD button. A camera samples a light field that has been projected into 4-D space/time. Then it maps the 4-D stream of images back onto a 2-D strip of film or a 2-D light sensitive digital chip. Then it feeds this recording into a computer for editing. Once the editing is complete, we burn the finished product onto a CD and there we have it -- the whole experience -- "in the can" as they used to say in the old days of celluloid reels of film.

Why do we experience the world in 3-D real time? WE USE TWO MOVIE CAMERAS TO RECORD AN EXPERIENCE, EACH CAMERA SHOOTING THE SCENE AT THE SAME TIME BUT FROM A SLIGHTLY DIFFERENT ANGLE. This is the Great Secret discovered by the moguls of HW/SV and a few others in the select circle of savants. These days when directors make a movie, they often shoot a single scene simultaneously from many different camera angles. Then they edit the footage into whatever artistic results they want to give the viewer. The result can be a 3-D image, a collage of various viewpoints and paces, or whatever effects the director wants to achieve. He even has lots of special tricks so no animals are ever really hurt, and all sorts of weird monsters and exotic scenery can show up in the film.

We as humans happen to have taken up the habit of shooting the movies of our lives with two cameras (eyes) and two microphones (ears) simply as an arbitrary "convenience" for navigating the type of game environment we chose to play in. We could have put as many cameras and microphones as we liked wherever we liked and gotten quite a different movie with very different effects. For example, most animals have an eye on each side of the head. Each eye records a different light field, usually with no overlap. They prefer a wider screen, or even split screen effect so they can see "more" of what is going on around them. The brain nicely splices the images together. They use stereo hearing to help, but bats and dolphins use mono sonar and have no problem navigating. Birds have no "depth" perception, yet they routinely fly about at high speeds in forests, landing on tiny branches with pinpoint accuracy. Hollywood and Silicon Valley are currently exploring and exploiting this simple realization that has been sitting on either side of our nose for the past few million years. They are developing this discovery into sophisticated movie and computer technology that is generically referred to as multimedia. But YOU can do the same thing with your life experience if you decide to change the way you shoot your script.

The video game is an even better analogy than the movie analogy, because it is interactive. The game burned on a CD will run on your computer as a simulation of some imaginary virtual reality. It can even simulate 3-D or any Hollywood effects you like. We are moving toward seamless multi-sensory virtual reality environments. You can wander around in the game wherever you like interacting with it. The game functions like a maze if you follow the rules. When you win the game, you find your way through the maze and out the end.

Actually you can exit the game any time you like, start over, reset the Avatar identity that you choose to play in a role playing game, and so on. You can even customize the game. The CD code is a one-dimensional track that the laser reads. But this laser read of a 1-D track affords us random access to any point in the data. That means you can direct the laser to any point on any track you choose to read from. You can direct this selection automatically from within the program, provide a menu for selecting track and sector, or just insert the laser wherever you want. The outcome, however, is that there is a sequence of events that forms your experience of the game in real time. This is no more than a sequence of bubble pit states. This simplest format has only two states: bubble on or bubble off. This greatly simplifies the problems of physics. We generate a hierarchical grammar that predicts whether a bubble will be on or off at any point in a bubble sequence. If we truly have random access, then the status of any bubble at any point in the sequence depends totally on the operator of the game and nothing else. Other factors come into play only when the operator sets up an arbitrary rule and then decides to let the system follow that sequencing rule. This is the Final Theory of physics. It is a No-Theory Theory because it is totally under the control of the Observer who has chosen to be a Player/Author/Director/Actor/Cameraman/Audience.

We can extract this maze geometry No-Theory from the CD analogy into consciousness and run the game mentally. All it takes is the ability to "remember" any rules (instructions) of the game we have defined and the ability to manipulate attention to follow them. Essentially we have a string of instructions -- go forward, stop, turn left, go forward, go backward, turn right, and so on. The instructions can be anything you like. Ask a video game freak if he can play his favorite game in his head.

We have no need to account for mysterious electrical or magnetic fields, masses, forces and all that business that clutters up physics. Under certain conditions such concepts may be useful as models, but they are not essential and do not hold up under scrutiny. Our video-game model shows us that physics is a totally simple and observable system that only involves a few key elements. Once you get it, you are free to travel and explore any type of experience in any part of any universe you can imagine. The universe is just a single bubble that jiggles around like the image on a TV screen. Even the 2-D screen is a projection. You are no longer restricted by Mr. Einstein' s arbitrary speed limits or quantum causality COPs (Causality Ordering Postulate), or any other restrictions that you may imagine the "secret government" or the "aliens" or the "demons" or "bad guys" or the competition are using to control your mind. Those are just characters in the game you selected to play. If you do not like the game, then rewrite the rules for another more amusing game, or get out another CD.

This is Observer Physics. It is straight forward and to the point. What you see is what you choose to create and put your attention on. What you put your attention on is what you get. And it is all YOUR game. So learn the basics of the game you are playing in order to play it better. Or go a step further and learn the general principles of OP so you can set up and navigate in any cosmic n-dimensional video game you like. Why pay Hollywood and Silicon Valley (and many other purveyors) for your entertainment when

you can create and run your own game in real time or any other time you like.

To get a better idea how the technology works it helps to extract yourself from the maze for a few moments. To extract yourself from the maze, simply turn off the laser. Just touch the OFF button. In our analogy the laser is your attention. You can loop indefinitely around in the maze of tracks on a single CD, but you will never learn anything about how the system works. You just may get very good at playing the particular game recorded on that CD.

So you can just turn off the laser. You can always turn it back on again whenever you like. It is so simple. Lesson one. Switch on. Switch off. Cool. This is your Attention. Switch it on. Switch it off.

You control your attention with your Will. You can point the laser in any direction you like. You can focus it or defocus it, move it around, turn it on and off. That is what your will does. You make decisions with your will. Harry Palmer has designed a set of simple exercises to develop the ability to manage attention with the will. You can find them in his little book, **ReSurfacing**. (You can get it at www.avaterepc.com.)

The CD that you burn the game onto is just an arbitrarily selected material that in its blank state is totally consistent. Theoretically you could use any medium that is consistent and malleable, but retains the shape you wish to record on it with reasonable robustness. In our analogy this is your Undefined Awareness. It has no opinion whatever about the nature of the data that gets inscribed on it. It will accept whatever you give it -- garbage, art, music, amazing stories and adventures, dull bleep-bleeep-bleeps, hot sexcapades, whatever you like, including nothing at all. Blank disk.

We record information onto the disk with the same kind of laser that reads the CD. To record we turn the laser on a little stronger so it burns little pits in the CD wherever it is focused. Advanced CD technology uses erasable disks so that you can wipe out information you do not want and then record new information on the same CD. The old technology of a few years ago only allowed one round of recording. When the disk was full, that was it, and you had to live with what you had laid down, bugs and all. That was the OLD technology. Not any more.

Just as a laser burns little pits into a CD, we define beliefs into undefined awareness. A strong focus of attention makes a belief seem more real, just like the tiny bubble-pit in the CD seems to define data on the disk. The recording remains as long as we like once it is burned in (barring damage or destruction of the disk), and we can play it over and over. When we erase the bubbles, the CD surface returns to its original state as a blank CD. Actually the CD is still just a crude device and our current video technology is not quite up to the level of pure awareness. But you get the idea.

We read the CD by scanning over it with a weak laser beam. This replays the recorded information just as it was laid down, without burning new pits or disturbing the old ones. The readout laser has random access capability and can intercede anywhere in the process,

speeding it up, slowing it down, freeze framing it, turning it on and off, and so on. Time, as you can see from this model of reality, is entirely defined by the way in which the laser scans the CD tracks. According to OP time is subjective and relative to the function of the attention under the control of the will. Hollywood understands this and exploits it when they create great slo-mo sequences in action films. Such scenes recreate for the viewer the experience great warriors and athletes have when they move into the Zone for fine detail performance during fast action sequences. Recent fine examples of this are "The Last Samurai" and "Kill Bill". (We are sure Tarantino does not refer to Bill Gates. After all, Quentin and Bill are making big bucks in the same business.) Watch slo-mo tapes of his Airness in action.

To summarize, we now have a model involving a laser, a mechanism for manipulating the laser, a CD, and an arbitrary array of bubble-pits that we can burn into the CD or erase from the CD. These represent our attention, our will, our awareness, and our beliefs. That is all we need in order to understand physics and play the game of life. Essentially core physics all boils down to belief management and attention management. Once you know how to do that, you can create, direct, produce, record, edit, play, and even market for big bucks any game you can imagine. The "laws" of physics are very simple and very flexible from this viewpoint, although we can certainly get down into a lot of specialized areas to explore.

McC' s "expansion" idea is one type of manipulation possible with the system. Cameramen call it zooming in. Or is it zooming out? It depends on your perspective. Then there is panning, time lapse, slo-mo, defocus, split screen, and so on. What we really need is to master the basics as an observer:

* Belief Management: How to create, manipulate, experience, and delete beliefs in the field of Awareness. What are the principles and techniques?

* Attention Management: How to create, manipulate, fixate, free up, and delete attention by means of the Will. What are the principles and techniques?

Awareness, Will, Attention, and Beliefs we already have. They are the essential components of our physical world, the four classical elements: water, air, fire, and earth. (In the poker deck we symbolize them with four suits: Hearts, Spades, Clubs, and Diamonds respectively. In the traditional Tarot deck these suits are Cups, Swords, Wands, and Coins.) We are already making great progress in understanding the technology of belief and attention management. For example, Harry Palmer has designed an extremely elegant program he calls the Avatar Course that unveils exactly these two fundamental components of science. Some people think his use of the term "Avatar" has to do with ancient Indian mythology. That indeed is where the word comes from. But it applies just as well to the modern computer technical notion of an "Avatar" as an identity one creates in order to play in an interactive virtual reality video game. A deep exploration of the Avatar principle includes not only developing skill in the creation (or discreation) of identities and playing out these identities as roles in a game, but also in designing the program itself and in understanding and manipulating the

entire technology.

Palmer' s Avatar may not be the Final Technology, and Observer Physics, at least in its present form, is certainly not the Final Theory of physics. However, these explorations definitely point the way toward some new breakthroughs in understanding and interacting with our world. I am not sure where McC' s FT takes us.

Nevertheless we can look at a few applications of what McC proposes -- his explanation of gravity, a few EM phenomena, and a few aspects of cosmology.

McC argues in some detail that the illusion of gravity derives from the expansion of all matter. Newton called gravity an attracting force, and Einstein called it a warping of space/time. It seems all three theories simply define one mysterious label with another one. We do not know where McC' s expansion comes from. We do not know what Newton' s force is. We do not know what Einstein' s space/time is. All three approaches simply redefine the problem without really telling us where gravity comes from. Since nobody seems to know where gravity comes from -- who or what REALLY causes it --, I have created a little theory in the context of OP. I will not get into all the equations and demonstrations. That is available to download or order in other papers listed at dpedtech.com. In this review we will just focus on the essentials of where gravity comes from in the first place.

According to OP all energy and forces derive from the observer' s expression of his Will. Energy is a potential that depends on a viewpoint defined by an observer. In the detached objective physical world there is no mass or force. To demonstrate this go observe traffic on the streets, watch the sun moving across the sky, watch kids playing basketball, watch a movie. In all that motion and interaction you -- the detached observer -- will experience no forces or masses. However, if you sit in a chair, you feel the chair push against your buttocks. If you slap a brick wall, you feel the brick wall slap your hand. When you push the accelerator in your car, you feel the seat push against your back. Where do these sensations come from? They come from your decisions to resist certain things. You shift roles from detached observer to active participant. Ironically physicists call forces that you can feel fictitious. To see the real thing according to Newton' s second law, you have to be fully detached in an inertial frame and just imagine that the forces are there.

All forces that you can experience are expressions of resistance by your Will as an Observer. You have decided to participate in your creations by pushing them around. If you totally relax, you will find yourself floating in space at the level of density equilibrium for the medium you have chosen to experience AS -- e.g. your body will float somewhere in your environment. For this reason Newton' s second law (F = MA) is wrong. All situations that involve mass (M) and force (F) necessarily involve the observer participating from the viewpoint of a non-inertial reference frame. But F = MA assumes an inertial frame. This is a fundamental contradiction. Therefore there is no way that a person can be sure what the real forces and masses are. He can only see the whole picture if he steps out of the experiment into a state of perfect equilibrium.

The ancients called that condition YOGA. Of course, in that perfectly balanced and detached condition there are no masses or forces to be experienced. They all vanish like magic. This is the place that the zero-point technology people are really talking about.

Now we are ready to see clearly where gravity comes from. Lean against a wall. Feel the wall lean against you. Now you understand that the leaning of the wall toward you and its pushing against your body comes from your deliberate decision to approach the wall and lean against it. The wall simply exists and has no opinion about you until you make an opinion with regard to it and initiate a physical interaction with it. This experiment tells us that the tendency of the earth to expand toward us or push against our body (or to pull us toward it by some mysterious attractive force) is simply a reflection of our decision to exist as a body living on this earth. We choose to interact with it, so it interacts with us..

Pick a desire, especially a nice little addiction. Say you like chocolate. Notice how you feel about chocolate. Do you have a certain amount of attention fixated on chocolate? Go find some chocolate. Feel how it is when you approach the chocolate. Put some in your mouth and enjoy the momentary pleasure of tasting and chewing and swallowing it. That is how gravity works. We are addicted to matter, especially this planet. So we are stuck to it and wake up each day mucking around here. It is just like a chocolate addiction. We can hate it and want to get away from it, or we can enjoy mucking about in it. The trouble with hating it is that pretty soon that urge comes up again and there we are indulging. We can go up in a hot air balloon for an hour or so, but then we will come back down to earth again and continue with our addiction to the planet . . . until we really let it go. Then we will float free.

So gravity is produced by a desire that we have decided to resist. Palmer reminds us (**ReSurfacing**, p. 50) that things will persist as long as we resist them. As soon as you stop resisting gravity, you find yourself floating. If you want to change where you are floating, the simplest way is to change what you are floating AS -- that is, change the density of your physical medium of experience. That medium is what you call your body. Of course, you can also use the brute force approach and blast off in a rocket like NASA. But this is rather crude and expensive and dangerous. It also suffers from the frustrating rocket equation. To lift more pay load takes more fuel. But fuel is heavy, so you need more fuel to lift the fuel, and so on. Our current energy economy suffers severely from the rocket equation syndrome -- so much so that we may just destroy the ecosystem we live in before we even get a handle on blast off procedures.

Saying that gravity comes from a mysterious expansion of mysterious electrons (or a mysterious pulling force that emanates from all matter) is really passing the buck instead of taking responsibility. The answers are quite simple and we all really know the answers if we settle down a bit and get honest with ourselves.

What is the fundamental belief that creates gravity? Explore for yourself. What would I have to believe in order to create the experience that everything in the universe attracts everything else? Here are some possible beliefs to get the ball rolling. Belief #1: Any

definition of undefined awareness focuses it, holds it within a boundary, adding to that bounded awareness an experience of reality, density, solidity, importance, attractiveness (pick your favorite label). Belief #2: By defining a viewpoint the Will creates a way of distinguishing I from Not-I. Belief #3: Awareness can use its aspect of Will to choose to identify with any viewpoint that it creates. Identification with "I" by definition means rejection of or resistance toward or abandonment of identification with Not-I.

If we create belief #3 while the prior beliefs (#1 and #2) still hold, then Not-I also functions as a defined viewpoint. It therefore has reality, density, importance, and attractiveness. The bigger, denser, and more important it is, the more attractive it will be. Uh-oh, something that is Not-I is pulling me inexorably toward it. It also pulls all the other creations that might be or become Not-I from ITS viewpoint. But we may forget that things got defined that way in the first place. Such core beliefs lay the foundations for the laws of psychology and the laws of physics. Recovery of transparent (invisible, forgotten) beliefs generates greater sense of responsibility.

In the gravity section McC claims that his theory only involves the idea that everything somehow expands. But then in his section on the atom he suddenly invents a mysterious subatomic space and a crossover effect to explain atomic structure and electromagnetic behavior. These inventions do not seem to follow the ST laws of physics. Here is an example that bothers me (although maybe I do not understand his argument). McC denies the existence of charge. Then he tries to explain how suspended rods with like static charges repel due to expanding electron clouds. I can visualize the idea that expanding electron clouds on rods with excess electrons can push the rods apart. But what happens to the rods that have a dearth of electrons? Why do they repel each other (even stronger than electron-rich rods) if there are no electrons out there expanding to push the rods apart? He seems to skip over that little problem. Also, if the excess electrons expand, what is to keep them from continually expanding until they push the rods apart even when they initially are separated by a large distance? He needs a Coulomb inverse square law in there that works like Newton' s gravity law. But his electrons do not seem to get less dense as they expand. Certainly the earth does not seem to get less dense as it expands from moment to moment. Maybe I missed something and need to reread this.

In some cases where McC says physics has no explanation he has simply ignored or missed what the ST says about it. At other times he is right about the inadequacy of ST, but there may be simple explanations that do not require matter to expand in the way he describes. For example, he says that there is no account for how a wire heats up when electric current flows through it. Therefore he wonders how a light bulb can give off heat and light. We all know the heat and light come from resistance to the current by the atoms in the bulb filament. The electrons drifting along interact with the wire material so that some of their momentum is translated into jiggling of wire atoms and becomes what we call heat and light. He is right that it seems at first glance mysterious how the energy from the battery gets transferred directly to the light and heat emanating from the light bulb filament without any change in the drift electrons. We can understand this trick with simple mechanics. All electrons are alike. Their mutual

repulsion makes them interact a bit like ball bearings. As the drift electrons move along the wire in the circuit, they move relative to the wire, but not so much relative to each other. They all push against each other like ball bearings in a circular gutter, and the whole circuit functions as a single entity, like a bracelet. It behaves as a single particle, though not quite as coherent as a superconductor -- but the same idea. If you push one bearing, the whole bracelet of bearings rotates as a single entity. So the energy input applied at the battery to drive the motion of the drift electron bracelet leaks out at the resistive part of the circuit -- the bulb filament -- where it transforms into excitation of the filament' s valence electrons, pushing them into higher orbit shells. The excited orbit electrons then relax back down, releasing photons as heat and light.

The circuit' s apparent action at a distance is an illusion created by a set of particles organized so they act as a single particle. Rub the palm of your hand briskly on your trouser fabric. You expend energy from your arm muscles, but the skin way down on your palm gets warm. Why? The mechanical friction localized on your palm is linked through your stiff skeletal structure to effort applied by muscles way up on your arm. Your bones and tendons heat up very little. McC' s fallacy is that he persists in seeing the drift electrons in the circuit as individual particles when they act as a unified current structure. The electrons do not need to expand in order to do this. Ordinary ST electrons work just fine.

We see the same situation with Newton' s famous bucket experiment. Physicists marvel at how water in the bucket lies flat when the bucket is at rest, but the water surface grows concave when the bucket spins, even though the spinning water is at rest relative to the spinning bucket. The bucket acts as a single particle catalyst -- what we could call a wave guide. Thus the rotating movement from the torque of the string that suspends the bucket passes through the bucket and, via friction, into the water, causing the water in the bucket to change shape. Ability to distinguish the two states does not depend on Mach' s principle or another mystical force at a distance. The system simply departs from previously defined initial conditions (bucket at rest relative to an external observer) by the unbalanced addition or subtraction of kinetic energy to or from the system by the external observer or some other local outside source that directly interacts with the bucket. A microwave klystron works the same way. Although the radio frequency photons that ricochet down the tube do disturb the wave guide slightly, most of the energy and the information it carries comes out the end of the tube. McC never elucidates the fundamental physics of wave guides. Much of what goes on in the universe works by wave guide mechanics. Any FT must explain wave guide mechanics.

McC' s theory of light as beams of electron clusters seems to have problems with intermittent pulses or single photons. If a free electron expands at the speed of light, how is it different from a photon? What then is a free electron? Free electrons exist and we can track them in cloud chambers. They do not seem to travel at light speed or expand. Low intensity light in the form of intermittent expanding electron packets would seem to expand to fill the gaps between packets, thus changing the beam wave length.

McC mentions the persistent cling of a permanent magnet on a fridge as a nice free energy source. Indeed many scientists are working to develop efficient motors that run on permanent magnets. We already use permanent magnets as gears for shifting mechanical energy into electric current. So-called free energy comes from disequilibrium in a system that causes a potential or an actual kinetic flow that can be harnessed to do work. We can easily harness a magnet to do work -- for example, cause iron filings to jump up in the air and cling to a magnet when it is held near them. Disequilibrium is always due to taking a certain biased observer viewpoint. An equilibrium viewpoint is always available, although it may not be so obvious. I can hold my hand next to the wall, or I can push against the wall. One case is in equilibrium, and the other is not. No work is done to the wall in either case from the viewpoint of moving the wall, but I expend a lot of energy in my muscles when I push even though it looks on the surface like nothing is happening. If I push a chair with the same effort, the chair moves and work is clearly done. Work is heat viewed from a Puritanically biased perspective. Meditate on this one: Why is work more valuable than putzing around?

The atoms in a permanent magnet line up so that their electron spins generate a coherent field. This allows a coherent flow of photons in the magnet and a correspondingly coherent magnetic field. Large numbers of electrons spin with their N axis pole pointing toward the magnet' s N pole and S axis pole pointing to the magnet' s S axis pole. The electrons more or less just spin in place running little tiny single-electron electrical circuits each with the same axis orientation. So the electrical energies of the mini-circuits all cancel out because they run opposite directions on opposite sides of the spins. However, the magnetic component runs normal to the electron spin and parallel to the spin axis. So we get a strong coherent magnetic effect. The photon wave packets are warped into spinning bubbles that pass through the magnet. You can see the bubble shapes with iron filings. The photons will interact with the electrons in the filings. The drawings you see in books of electrical and magnetic field lines are actually the shapes of photons of various wavelengths. They look like standing waves just like the electron shells look like standing waves.

The magnetic field (standing wave photon bubble set) around a current-carrying wire extends in space forming a cylindrical field around the outside of the wire. This magnetizes the wire. All that means is that the photon bubbles will interact with electrons in any wire brought near it, causing an exchange of energy. The electrons will move to orient to the photon bubble-waves, and the motion of the electrons will drag the atoms along with them, and the wire will move. Every permanent magnet must have current inside the metal in order to produce a magnetic effect. But the permanent magnet' s current is just the spin on the electrons. (There is more to it, but this is the general idea.) We do not need for electrons to expand. The electrons remain tight little vortexes. Photons constantly emerge from the electrons to link up with positrons. Their vibrations set up standing waves because many just loop around with the other electrons in the magnet.

When we put a permanent magnet on the fridge door, the standing wave photon bubbles around the electrons in the atoms in the iron in the fridge door near the magnet line up

with the magnetic field of the magnet and the magnetic flux just goes through that medium. In other words, the fridge photon bubbles all align with the magnet' s photon bubbles. Unlike a current in a wire the electrons are not drifting but spin in place, and their magnetic field is focused and directed. The principle is the same as with the interaction of chemical ions. However it usually is not quite as strong because the roughness of the outer surfaces of the fridge and magnet materials creates separations at their interface that are greater than ionic bonds, and the influence drops off as the inverse square of the distance. If you polish two materials until they are very smooth, they will usually cling together as if bonded even without magnetic properties. The magnetic interactions of the aligned electrons link the materials as if they formed a single entity. The fridge metal already has magnetic property, so it aligns temporarily with the magnet' s electrons, even through rough surfaces and a layer of paint. The system sustains itself due simply to the momentum of the electron spin in the magnet and the alignment of the spins. Unlike ordinary tops the electrons just keep spinning. Why spinning electrons in any type of EM bonding do not lose momentum is something quantum physics does not explain, as McC mentions. That seems deep because physicists do not understand the nature of quantum spin. The specialty of quantum spin is that it is not really spin like the spin of a top, but a vortex motion of photons within high points of density potential.

Quantum spin in electrons is the source of what we call charge. (ST understands this much and waves some esoteric mathematical formulas to demonstrate.) According to observer physics the only particles with charge are electrons and their antiparticles called positrons. Charges in other particles are due to the presence of electrons or positrons inside composite constellations of subatomic particles, such as protons or just highly energized electrons such as muons. Electrons and positrons are two sides of the same coin that have been separated in space/time (a mental idea) by an act of resistance on the part of the observer. Electrons are made entirely of light (EM waves/photons).

Light is simply awareness defined as Not-I. If you define yourself as light -- and really mean it, -- then you are enlightened by definition. The description of a magnet on a fridge is a projection into three dimensions due to observing with crossed eyes. There is only one photon -- Undefined Pure Awareness -- and it never goes anywhere. We play games with it. We can be it, observe it, or ignore it by manipulating attention with the Will. We call these manipulations beliefs. Space, time, matter, force, and motion are all illusions made by clever manipulations of The Light, the one and only Bubble of Awareness. TV, movies, and computer technology reveal this truth for all to enjoy. The real mystery is why people who are already watching TV 24/7 want to watch TV while they watch TV. On the other hand, as Timothy Leary said when he made his Final Transition -- Why not?

Electrons are vortexes of light that swirl out of point sources. The point source of each electron is connected through a belief in space/time with a partner positron. Space and time -- as we showed in our video game analogy -- are just experiential ways our brains keep track of shifting observer viewpoints with regard to EM frequencies. It is easier to encode the stuff spatially and temporally as experience rather than calculating all the

numbers like a computer or lining up little bubbles in plastic. But it boils down to the same thing. It is like color-coding your documents -- a handy way of organizing data. In our imaginary cross-eyed 3D space the light photon coils out of the point of an electron' s singularity (i.e. the center of a mini white hole) and then coils back down into the singularity point of a positron (i.e. mini black hole). The two are back to back as you can easily see when you do pair creation in the lab. They both emerge from the same space/time point. To an outside observer they seem to separate, but they always stay connected via EM effects until they meet and undergo pair annihilation. These EM effects are what we call space/time. Space/time is a reflection from the Not-I viewpoint of our own mental I jumping around as an attention laser from idea to idea, belief to belief, the will bouncing about like an excited monkey unable to control his attention. There is really only one photon -- The Light. We can also call it Undefined Awareness. All other photons, electrons, and so on are optical illusions created by defining space/time in interesting ways. An electron that moves temporally seems to travel through space slowly by itself. An electron that moves spatially (faster than light) resembles a current in a wire or a set of electrons in various atomic orbit shells. In other words we clone particles by shifting them faster than light. We end up with a lot of identical subatomic particles forming organized arrays. A pure crystal is a beautiful example of a core geometric structure of nucleons and electrons that is moving hyperdimensionally faster than light (in our cross-eyed world), and thereby appearing to clone itself into an orderly array of identical atomic structures. We may look at it and just say, Oh, a pretty rock. Hydrogen gas is atomic hydrogen cloned by attention shifting faster than light.

This is what I mean when I say that all the drift electrons in a circuit are a single electron vibrating faster than light in an orbit. We see something like a stroboscopic effect that looks like a lot of separate but identical electrons drifting slowly around in a circle. This phase wave phenomenon is like the rapidly spinning wagon wheels in Western movies. To the observer' s eye they look like they are turning very slowly, or even turning backwards.

An electron going at light speed looks like a photon. This is what McC seems to say. I think a clearer viewpoint on this is to interpret the photon as the basic particle. That allows you to look at the internal structure of the electron as composed of photons. A photon has no structure other than its wavelength/frequency. That frequency represents a certain potential, a level of observer bias or resistance. The electron/positron pair acts like a wave guide that makes a photon slow down and wind as a vortex in and out of a viewpoint. The vortex as a whole can appear to drift about in a larger context with its own slow motion, but it acts like a fermion, because it is only half a particle. It will not fit together in the same space with another electron. You need the electron and the positron together to have the whole spin cycle with its boson nature. These two fermions form the bookends on the story of EM transactions. The photons exchanging between them give us an illusion of space and time based on the viewpoint from which we observe the electron/positron pair. From the viewpoint of virtual pair production and annihilation they only exist in the present moment -- NOW -- as a single tiny bubble of Light.

Line up three marbles. The two on the end only have a single contact point with the sequence. The one in the middle has two contact points, one on each side. If you tap one end of the row, the marble in the middle always gets tapped on both sides going both directions. This is nature' s handshake system for communicating. Ordinary electrons can only approximate the wholeness of photon pairs by forming into Cooper pairs, one with spin up and one with spin down. Atoms and arrays or streams of electrons are actually composites made of photons moving in certain patterns faster than light. We can interpret an ordinary beam of photons from emission at a source electron to absorption at a terminal electron as a single superluminal photon that forms a standing wave, repeating itself over and over in the interval between the two electrons. Each photon has an antiphoton partner that travels with it unless the two are split into corresponding sets of phase waves (Vp) and group waves (Vg) by the interference of a wave guide. (Vg * Vp = c * c). This is how we go cross-eyed. By the way, this velocity equation (derived from ST!!!) shows that if information transmits slower than c via Vg and c is a constant, then the same information transmits faster than c via Vp.

McC is correct that Einstein made a meaningless substitution of (c^2/c^2) in his special relativity proof. He is also right that relativity works in both directions. Einstein created the relativistic factor (1 - v^2/c^2)^1/2 with the little substitution for mathematical convenience. His time dilation principle still holds. Consider the famous light clock thought experiment.

Let us say that the clock at rest bounces light between mirrors separated by distance (d1). So d1 = (c Dt1), where c is the speed of light, and Dt is the time it takes for a photon to travel between the mirrors. Now we make an identical light clock, but have it move normal to its light beam at close to light speed. Obviously the observer by the resting clock sees the photons in the moving clock travel farther for each tick. The light clock also seems to tell time slower because the photon seems to have to run farther in the resting observer' s space. We can call the apparent diagonal path of the photon in the moving clock as seen by the observer at rest (d2) = (c Dt2), where (Dt2) is the dilated time interval he measures. Taking (v) as the velocity of the moving clock, we get by the Pythagorean relation:

* d1^2 = (c Dt2)^2 - (v Dt2)^2.

Here is where Einstein does his little trick. He multiplies the term (v Dt2) ^2) by the factor (c^2 / c^2). This allows him to divide the whole equation by the factor (c Dt2)^2.

* d1^2 / (c Dt2)^2 = 1 - (v^2/c^2).

He then takes the square root of the whole thing and ends up with his famous factor.

* d1 / (c Dt2) = [1 - (v^2/c^2)]^1/2.
* Dt2 = (d1 / c) [1 - (v^2/c^2)]^-1/2.

Suppose, however, that we step back and leave out the little math trick. We still get:

* (Dt2 / Dt1)^2 = c^2 / (c^2 - v^2).

You can see from this that when (v) is very small, the ratio of time intervals (Dt2/Dt1) is practically unity. However, as (v) approaches (c), (Dt2) gets much larger than (Dt1). This is time dilation. It is a universal principle of geometry. It produces the Doppler shift for sound and for light or for any other wave phenomenon that travels through a

medium. Sound has a certain speed in air, and another speed in water. Light has a certain speed in water, and a certain speed in open space. The Doppler shift is based on the speed of a wave in the medium through which it travels, taking the medium as its rest frame. The sneaky assumption on Einstein's part is that light has a fixed speed limit based on its behavior in space, and that nothing else can go faster than light. That is not true as the Velocity Equation clearly shows, and the Velocity Equation falls right out of Einstein's own equations. Under many conditions light travels much faster than (c). The key point to notice is that reliable communication requires the handshake routine. That is why we say Hello into the phone. This is a convention for establishing a phatic connection. We know that we are talking to each other. To broadcast a radio program when no one has a receiver is a big waste of time. When light travels faster than (c), the pair of handshaking (c)'s splits apart. The photon and antiphoton do not shake hands and travel together any more. It becomes like a conversation where one person speaks Greek and the other person speaks Chinese. After a while you may stop listening, but if you pay attention, you can learn to understand the other guy. Therefore, to send signals under these conditions requires a special viewpoint shift. Superluminal phase waves use the wave guide principle. So do subluminal group waves. But they use the wave guide principle in different ways. In order to read superluminal phase waves the observer must shift his viewpoint 90 degrees from his subluminal viewpoint and expand his viewpoint until it is larger than the entire wave guide. For example, if a message is sent down a klystron tube, you can wait patiently at the end of the tube and collect the data as it emerges at the slower-than-light velocity. This is like talking on the phone. Or you can shift 90 degrees and see the whole message spread out along the klystron tube and read it as a long sentence all in one shot. This is like reading a ticker tape message en route instead of waiting for it to arrive. We do this very effectively when we watch a movie, using a 2D wave guide to transmit even more information in parallel. We watch a movie in phase wave mode, so we do not sit at the edge of the screen and wait for little pulses of light to emerge. The projector shines a complete 2D image right onto the screen all in one shot. Then we position ourselves normal to the screen where we can see each entire image all at once.

McC is right that time dilations and length contractions are relative, which means they go both ways and the effects mutually cancel out. Relativity is a trick of perspective. An observer riding on the moving clock sees the resting clock slow down in the same way that the resting observer sees the moving clock slow down. Which clock moves and which clock rests depends on the reference frame the observer chooses. The dilations and contractions are all subjective illusions based on observer viewpoint the same way that a circle seen from an angle looks ellipsoid or even collapses into a line. But we still must take these distortions into account when we describe our experiences because we experience the world from different viewpoints. This is the psychological aspect of physics.

We can derive the Velocity Equation that I mentioned above straight out of standard klystron technology (or in a variety of other ways). A klystron is basically the same as Einstein's clock. A photon zigzags down the tube at velocity (c), so its progress relative to the tube must be ($Vg < c$). But the moving wave front is normal to the photon

trajectory. Therefore it strobes the klystron wall at the velocity (Vp > c). We have two similar triangles here that share two different parallel lengths of the klystron walls and also share the trajectory c. So we get the ratios (Vp / c) = (c / Vg). This is the Velocity Equation. Obviously there is no speed limit involved. The (c) could refer to the standard speed of any wave form moving in any medium. Whether an observer looks at Vg or Vp, and even how he labels these wave forms, that is the observer' s choice. One speed goes faster than light, and the other goes slower than light. But (c) does not mean much as a constant if you can go any speed you like, whether as matter or as energy. Whether we operate viewing Vg or Vp is a matter of a 90-degree shift in perspective. You can stand by a road and watch the cars go by one at a time or get high in a helium balloon or skyscraper and see all the cars at once. It is a 90-degree shift of perspective, from serial to parallel transmission. We all do it routinely.

There may be wave forms that routinely travel through certain media at speeds way beyond the speed of light in open space. Then the Velocity Equation will give different values for each of the three components. This is an area worth exploring.

McC nowhere mentions in his FT the principle of the Star Wave, that when we absorb a photon with our eye, we actually send an antiphoton mentally backward in time to the source of the photon that we have projected to be an external source. This is the standard handshake in phase conjugation theory, represented mathematically by the product of the wave function (Phi) and the complex conjugate of the wave function (Phi*). The outcome therefore is (Phi) (Phi*). The complex conjugate is like the original wave function running backwards in time. We emulate this with computer communications. When we do the math, we find that the two partners (photon and antiphoton) seem to travel together in open space.

* (+s/+t) = (-s/-t).

It is weirdly simple. Velocity is a ratio of space to time, and that is how ratios work in mathematics with respect to direction. So going in the negative direction backwards in time is the same as going forward in time in the positive direction. Bosons are very wavelike, gregarious and like to be together. Objectively speaking photons and antiphotons are indistinguishable because the observer viewpoint is totally relative to which end of the interaction you view from. This is not true for the fermionic electron because of the viewpoint we have chosen by habit -- to focus on the pokey-slow so-called group velocities (Vg). (The Vp speeds are also group velocities, clusters of waves interacting. Single waves do not carry information.) The electron is only half a particle because it is a winding photon stream that just LOOKS like a particle. The antiphoton component is invisible because it is YOUR attention. We habitually sit and wait for photons to come out the end of the electron vortex wave guide. We could shift 90 degrees and see the whole stream of photons winding their way through the electron' s vortex-shaped klystron. Then the world would look quite different to us. Each electron is like the Grand Canyon. As you go down the canyon walls, you can see the geological history of the planet. As you look at deeper and deeper curls of the electron spiral you see photons from earlier and earlier in the history of the universe. The whole thing forms a time-independent standing wave just like the electron orbit. You can see this shape in the photographs of electron-positron pair production. Two particles split

apart and scatter in different directions. Under the magnetic influence they curl into a vortex. The books all say they move in circles. But the photos do not show circles. They show spiraling vortexes. The electrons lose momentum in the magnetic field because they radiate brehmstrallung photons as they curve. So we must pump them to keep them going in a circle. The other half of the electron vortex is its positron partner that scatters off curving in the opposite direction. This is the crisis of atomic theory. Free electrons curving in a magnetic field lose momentum and spiral inward to a point. Why don' t orbiting electrons do the same? QM uses the viewpoint of the Time Independent Schroedinger Equation to represent the orbiting electron as a standing wave. This stops it and therefore eliminates brehmstrallung. Certainly this viewpoint works, but it ignores the dynamic interactions that go on inside the atom. Where are all the positron partners for the electrons? Why do protons have a positive charge? The answer is simple.

The missing positron partners are hiding inside the atomic nuclei. The dynamic buffer system required in order to maintain them alive there is what gives us the clever illusion of solid matter. According to ST an electron in a valence orbit around a nucleus generally can only receive a single photon at a time from another electron and then it shifts up an orbit to account for the gain of photon energy. Then it must dump that photon and drop back down to a lower orbit in order to receive another photon. Our entire sensory experience of the universe is based on this little photon exchange.

Close your eyes and notice the afterimages of what you have just been looking at. Electrons in your eyes are releasing absorbed photons. They echo around and some are reabsorbed again by other eye electrons. That is why you can even see afterimages from bright objects with your eyes open if you pay attention. Your eyes have to dump the photons they absorb in order to absorb new ones just like your muscles have to relax in order to contract and do some more work. Maybe that is why the eyes of really alert people seem to sparkle! They are actually reflecting what they see. If you look closely, you will even see yourself in that person' s eyes when they look at you.

You can go much farther with this simple experiment. Go into a dark space and cover your closed eyes and wait until all the afterimages fade away. Does the field of vision get totally black? No. If you pay attention, you will see it sparkling everywhere. Electrons in your eyes seem to be spontaneously emitting photons that other eye electrons can pick up. You can see yourself as an undefined steady-state field of scintillating light. If you move your eyeballs around, any leftover afterimages will move. The light field does not move; it fluoresces (phosphoresces?) It is the biological version of the cosmic background radiation leftover from the Big Flash. Once you are adapted to seeing the background light field you can see it clearly anytime of day or night by shifting attention to it. You discover that darkness is a totally imaginary mental state of the attention, not a physical reality. Now remember the analogy of the movie projector? What if when you stop projecting slides onto the screen you can just see the screen itself sparkling? It sparkles from the light of the projector falling on it. Why not shift your attention to the projector bulb itself? Depending on your skill at holding attention, you can move into that light and even beyond it. Light as a phenomenon can only exist at a certain distance

from its source. Below that distance we enter into the primordial soup of quark chaos and into the Big Bang Unified Field. You **become** the Light. When you **are** something you exist AS it. This is quite different from observing it from a gap of separation.

So the real photon loop in projected space/time goes on between the electron and the positron. A photon always is at rest relative to itself and appears to move at a very fast velocity (called c in empty space) relative to anything else. But the speed of a photon is a projection based on the observer defining himself as separate from his creation. Therefore quantum spin has a constant value for an electron. That spin is the constant speed of light on the outer rim at the de Broglie radius of the electron. Below that radius photons go much slower. At the crossover point between positron and electron the photon is like a pendulum at its outermost swing. It stops and enters eternity and infinity for the single unbounded moment of NOW. Since light is the original substance of awareness, from its own viewpoint it never goes anywhere or anywhen. It exists only in the NOW of the point where it balances between electron and positron vortexes. The electron' s quantum spin is the electron' s way of reflecting its original nature as pure light. But, just as light shows this in interactions as a running away from its source at speed c, the electron shows this in interactions as a resistance we call charge.

What looks like spin is the vortex movement of photons emerging from the dense spiral wave guide of an electron. Once a photon hits the low density of open space (at the electron de Broglie radius), it seems to radiate outward away from the electron at the speed c until it hits a receptive positron. Almost always it will find a positron inside a nucleon, because that is the only place these antiparticles can find a stable existence -- ironically right inside the maelstrom of a proton. Positrons give protons a positive charge exactly opposite to the electron. The buffer energy required to keep the positron alive makes the proton seem much heavier than an electron, even though the net charge is the same. You can demonstrate the basic dynamics of the electron-proton system by running water from a faucet into a sink with a drain. The faucet represents an electron, and the water flowing from it through visible space represents the flow of photons from the electron to the proton. The water in the sink is the energy of the proton. The drain is the core of a positron. Water swirls in the sink and goes down the drain, forming a hole in the sink' s body of water. This hole is the positron. Water going down the drain becomes invisible, traveling backward in time. To complete the loop we imagine the water evaporating and then condensing back down into the reservoir tank (electron core) that supplies the electron faucet with more water for the sink.

The photon gets sucked into the proton, not by gravity, but because of the vacuum and because of the momentum of the system defined by the observer. If he decides to turn off the faucet, the water will stop flowing and the sink will empty. The water will all disappear into the invisible vacuum state.

From a distance an electron looks like a little top with a magnetic axis through its center. The black holes we see in space are large-scale models of the positron, and work the same way, but suck in whole stars as well as light, dust and other space junk. Positrons only suck light from electrons and other denizens of a proton. Then they squirt photons

out from their central axis into an electron white hole axis just like the jets that shoot out of a black hole' s axis, except that there is no separation in space/time when this happens with a positron back at the moment of pair creation. The ejection is more like an injection, or a continuation. The photon spirals into the black hole singularity of positron past time to the moment of pair creation. Then it spirals out of the white hole singularity (forward time evolution of the universe) with no gap in between except for one instant of NOW in which the photon finds itself everywhere, one with the ultimate Universal Photon. There is no friction at the subatomic level, so the dynamic photon loop continues as long as the electron/positron vortex pair exists as a mental creation in our universe. Once the two coalesce into equilibrium, the vortexes cancel out in future time and the two particles disappear, releasing all their structure as pure light, pure awareness, beyond time. Modern physics quite accurately says they experience pair annihilation and return to the vacuum state. They do not really annihilate, but just change from actual into virtual (or potential) particles and Light.

Understanding the fundamentals of creation requires an understanding of how awareness creates consciousness. It also helps to get familiar with the newly emerging basic science of phase conjugation and coherent systems. This is a vast technology that applies to all WAVE FORMS -- which includes everything, since anything, even consciousness, can be expressed as a wave form. In his FT McC does not consider the vast technology involving phase conjugation, 4-wave mixing, quantum entanglement, and quantum bubbles at all and barely touches on consciousness in his brief discussion of the hypothetical programmer.

From the OP viewpoint creation of physical matter from pure awareness occurs in just a few simple steps based on the definition of awareness by will. Define a viewpoint and call it I. Anything outside that definition automatically becomes Not-I. This polarizes undefined awareness. (O---O) It also creates gravity as a linear flow of potential connecting the two singularities, the points I and Not-I. The two are attracted to each other because they exist separately only as arbitrary definitions of awareness imposed by the will. Their true nature is undefined awareness with no restricting boundaries. We can also see the creation as a bubble of Non-I around a Point of I. The radius is arbitrary. Any point on the bubble of Not-I sees I as a point on its own bubble of Not-I and sees itself as I. The combination of these two viewpoints forms a 3D Vesica Pisces, the figure that Euclid placed as his first demonstration of GEOMETRY. (We assume that I and Not-I have the same arbitrary relative displacement. See Euclid' s first proof in the **Elements**.) The will itself is a possibility of awareness among many possibilities. When activated by defining itself, it becomes I. Not-I becomes an objective creation that appears to lack I-ness. But that is a relative viewpoint. I can be any viewpoint that "I" decides to take.

No definition lasts longer than the instantaneous intention to create it. In an article entitled "A Theory of Electrons and Protons" Dirac calculated that the universe collapses in about a billionth of a second (10^-8 s) -- the time it takes a photon to move about one foot -- but nobody believed him. (One calculation I do puts the collapse time at around one light-meter, which is pretty close to Dirac' s result.) If this view is correct, then to

sustain anything, from a thought to a solid material object, requires persistent recreation of the solid definition of the belief. This expends our available attention. Attention itself is a defined creation, so it is not infinite. At some point the supply runs out and the definition (object, etc.) dissipates. So it is extremely easy to get rid of anything simply by managing the deliberate use of attention. The main problem is usually all the beliefs about how hard it is to get rid of stuff that holds things back -- with a great wastage of effort.

Creation is also easy. But to maintain a creation requires setting up looping programs called automatons or subroutines that may loop continuously or whenever called by another program. These subroutines consume CPU time and energy. Therefore the most effortless mode of existence is to live entirely in the moment balanced in equilibrium.

There is another interesting problem associated with the primordial creation of a separation between I and Not-I. The I-ness can not perceive the Not-I. What is the point of a viewpoint if you can not view anything? At this primordial stage in the game there is no mechanism for perception. Both I and Not-I are still totally imaginary. We need to jazz things up a bit with some additional beliefs. So let us reject the first "I" and try jumping to a new viewpoint. This has to be a rotation relative to the Not-I and the first I, regardless of any scale shifts -- which are invisible in any case. This gives us three points and generates a triangle. Actually what we now have is two potential beams of attention (one from Ia and one from Ib) that intersect at Not-I incidentally forming a plane. Actually we have a 90-degree shift that gives us an L shape. The beams are indefinitely extendable in either direction so we really have an X shape (or + shape, if you will). This is the beginning of 4-wave mixing, the basic pattern of phase conjugation. Nevertheless we still do not see a thing, as there is no mechanism for that yet. However the X structure resonates due to a contradictory resistance to unity and a desire to perceive. It also rotates due to the secondary shift of viewpoint. Of course, with no perception or context, we can not see any rotation yet even though we did shift viewpoints. But that rotation is the essence of the electron and gives it its vortex structure and its consequent property of electric charge. Like the caterpillar' s magic mushroom, one side has positive charge, and the other side has negative charge. The spin moves energy in opposite directions as it circulates. Furthermore, the charge is a reflection of the resistance it takes to jump away from the first viewpoint, just like gravity is the reflection of the resistance it takes to separate I from the Original Light of Pure Undefined Awareness and define the Light as Not-I, thereby externalizing it. The charge is quantized because the Original photon always moves with the same velocity -- c. That is the speed with which photons exit the electron at the de Broglie radius. (Inside they move slower.) If I AM the Light, then I do not move. So c = 0 from that viewpoint. If I SEE the Light, that is a different story. So c is the apparent speed with which I separates from the Light. Not wanting to take responsibility for that sudden loss of energy, we say that the light moves away from the observer at the speed c. And you still can not even see it! (Sigh.)

The observer still can not see anything, so he makes another viewpoint shift, rotating

again relative to the whole 4-wave mixing plane. This seems to make the spinning electron top tip over, starting a precession and generating magnetic effects. We now have a 3-dimensional bubble, the foundation for the building of proton/neutrons and a stable foundation for a physical universe.

There are three types of matter, one for each dimension of space. By matter we mean 1/2 spin fermions. McC does not consider the nature of quantum spin, though he does try to describe gyroscopic dynamics with his model. There are neutrinos, electrons, and nucleons. All the other fermions are variations on these fundamental creations.

Light is a zero-dimensional boson -- pulsating pure awareness, pure existence, with no particular shape, size, charge, mass, or wavelength. All such properties require perspective and perception. Bosons are the interface between mind (antiphoton) and matter (photon), so they have spin 1/2 + 1/2 = 1. Mostly we detect photons, but the other bosons are important also and we can detect them with heightened sensory perception. The photon is an objective phenomenon. The antiphoton is a particle of attention vibrating in consciousness. We can only detect the photons that we sense with our bodies. All others are imagined. Each photon that we detect with our senses teams up with an attention particle that we create with our will in consciousness. Mathematically the two sit together in all the standard equations, although the physicists arbitrarily ignore the imaginary mental components and only focus on the real physical components. After all, you can not see or detect consciousness. It is subjective.

Neutrinos are "1-dimensional" interference patterns of photon clusters, group waves that overlap but do not form true vortexes, but helical trajectories. That is why they oscillate from one type to another as they fly through open space, but have only the tiniest masses, -- really just linear momentum like photons. Physicists can not see them, but they infer their presence as gaps in the energy or momentum statistics of particle interactions. They are accounting tricks to make sure that the conservation laws hold. As free fermion particles neutrinos are much smaller than electrons and they do not at all fit into McC' s FT, so he does not bring them up. But generally every time a charged lepton occurs in an interaction a neutrino will be involved also. We can not detect neutrinos as they fly because they have no charge. Free neutrinos are also very hard to catch for the same reason. Free neutrinos rarely interact with matter even though captured ones are found inside every nucleon as tiny standing wave packets. Freed up neutrons emit antineutrinos as they spontaneously decay into protons, so we can manufacture neutrinos on demand from nucleonic neutrons. We can store them in the neutrons and release them by freeing the neutrons so they decay into protons and pulling the protons out of the mix with magnets. Neutrinos are between boson and fermion status. We class them as fermions because they are split like the other fermions, but, like photons, we only detect the physical half. However, we know it is only half because we always detect only the lefthanded helical half. Lacking the charge that comes from a true primary rotation, neutrinos probably have neither secondary rotation nor up or down orientation. These particles are so poorly studied due to the difficulty of observing them that my comments on them are very tentative pending more data. (See my paper on neutrinos at dpedtech.com.)

Electrons are two-dimensional photon vortices that have the added value of charge due to the rotation we call spin. They are the smallest true fermions in my view. Their spin makes them "hard", as if they were solid objects, although they are not. A tornado looks solid and packs a wallop, but it is really just air. What makes it seem powerful is that its component photons whirl around in a vortex rather than traveling in a straight beam through space. (See details of electron structure in the paper "Energy from Electrons and Matter from Protons", available at dpedtech.com.)

Protons are three-dimensional bubbles of photon energy enhanced by neutrinos and electrons in a specific clever way. They have spin also because they contain sub-components that have spin -- electrons, positrons, neutrinos, and quarks (relatively large neutrino standing waves in OP theory). When you add up the spins, you get spin 1/2. Protons are actually the resultants of three quark particles that, are unstable by themselves, but hang together as a stable interaction. According to OP six leptons also lurk among the quarks unnoticed by ST physics. (See a detailed description of proton/neutron internal structures in "Energy from Electrons and Matter from Protons", at dpedtech.com.)

To continue our epic search for perception, we find that we can not see neutrinos, and we can not see the photon exchange between electrons and positrons. We can only really start to see things when we have stable atoms and the full electro-magnetic effect has become available. For example, the brehmstrallung of free electrons only happens when a strong magnetic field bends their trajectories and then interaction with atoms slows their momentum. The secondary rotation that we just discussed causes magnetism. So brehmstrallung of free electrons is just a sort of highly exaggerated atomic structure phenomenon spread out as electron orbits large enough to see the action. With our physical organs we only sense EM interactions between electrons -- by far the tiniest fraction of the real action. We have really shut down almost the totality of awareness all for the sake of gaining a tiny little trickle of perception. It is like giving away billions of dollars to get the change of a few nickels to play some songs on a juke box.

The electron is not an inert lump, it is like a tiny tornado of photon energy. This energy constantly pours out of it. Most of the time it disappears from a free electron into the space around the electron, sucked up by the cloud of virtual positrons that surround the electron. It then disappears into the vacuum but then recycles back out through the electron singularity. Occasionally other electrons absorb the emitted photons. This is the only mechanism by which we can see, feel, or in any physical way perceive our universe. But, for captured electrons moving in shells around nuclei, almost all of their photon flow constantly goes into the nucleus just like gas from a star being sucked into a large companion black hole around which it rotates. We can detect the rapid vibrations of the electron as this process occurs, but we can not see the brehmstrallung because it goes into the nucleus. Visible brehmstrallung only occurs when rapidly moving free electrons scatter off the electric fields of atoms of a gas or liquid, lose momentum, and change direction. That is how we know that it exists as a phenomenon.

Standard QM arbitrarily made a rule that there is no brehmstrallung for orbiting electrons, because otherwise the braking effect of the nuclear electric field would seem to cause them to fall out of their orbits into the nucleus. To settle this troublesome issue physicists use the Time Independent Schroedinger Equation to interpret the orbiting electron as a statistical standing wave structured by Heisenberg uncertainty. Since the electron according to this interpretation does not move, it does not have to radiate. As McC might say, this is like using the work theorem to show that I do no work when I push against a wall because the wall does not move. Work is a force through a distance. No distance means you perform no work. The QM interpretation is OK from the viewpoint that there is no way we can ever see the brehmstrallung radiation from the outside. However, OP posits a continual dynamic energy exchange loop between the orbiting electron and the nucleus. To say that an orbiting electron does not move ignores the reality that when an ion captures an electron, the electron has much momentum. It is not likely that the nucleus instantly absorbs all the electron momentum. More likely it dominates the orbiting electron' s interactions the way our Sun dominates our solar system. Ptolemy believed that the earth stood still and everything went on around it. In a way that fits the data. But later we found that the Copernican model fits the data even better. The quantum nature of electron orbits is based on their vibratory nature. Also valence electrons do a lot of shifting about and can even be stripped away. So a Time Independent interpretation is at best a VERY rough Ptolemaic approximation of what is really going on from an outsider viewpoint that can not see the real inner dynamics. The internal energy exchange scenario seems more likely just like it is more likely that my muscles are doing lots of small unseen batches of work inside my arm as I strain to push against a brick wall or that the planets are moving in orbits around the sun.

Once the secondary rotation begins, the electron starts a precession motion. A rotating system can only have two simultaneous rotations.* The secondary one often is much slower than the first, and it defines the direction of the vector that forms the axis. (By definition we call the faster rotation the primary one, and the slower one -- the precession -- the secondary one. They can be equal, however. Then it is a toss-up as to which is the precession.) Previous to any secondary spin the primary axis has no preference, north or south, up or down. This is also true for ordinary tops. When a top starts spinning, it instantly (superluminally) creates a macroscopic standing phase wave axis that runs through the top' s center. A gyroscope spins rapidly about that axis with a wobbling precession as it rotates on one pole of the axis, trying to fall over, whether from the pull of a gravity field or from the turning of a submarine or rocket. This breaks the symmetry of the axis poles. That is why magnets have north and south poles that behave quite oppositely. The precession is always in the direction of spin. In other words, when I first spin the top, I get an axis that is normal to the direction of spin. That charges the top. If I put a secondary spin on it, by turning the primary spin axis, the primary axis twists normal to the secondary rotation, but the top then resists and follows the direction of the primary rotation. Get a gyroscope and feel this strange torque that seems to defy our ordinary senses. This is a reflection in a common mechanical system of the orthogonal structure of EM waves (which is really the torque of the twisting electron/positron pair). This torque goes back to the original belief that by

shifting dimensions we might find a better viewpoint on an original creation when we find that it does not turn out as expected. So we do the twist instead of erasing the original creation and starting over from scratch. Then we keep piling on more and more layers of creation until it starts to look like a big mess. Time to take a break and relax.

So a magnet clings to the fridge door in the same way that a top can hang over the edge of a table almost at 90 degrees and not fall. But the top will fall when friction slows down its spin. The magnet feels no friction, so the little electrons in there just keep spinning. As McC rightly points out, even a spinning top falls if it has no support at all. This is too bad for the saucer buffs. The magnet can cling if it gets close enough to the fridge because it mimics ionic bonds. All chemical bonds (whether ionic or covalent or just van der Waals interactions) derive from the reflection property of resistance. Newton calls this action and reaction, his third law of motion. Undefined awareness resembles an infinitely elastic silly putty. You can define it and distort it into any shape you like, but it always eventually rebounds back to its undefined nature. The attraction of gravity reflects our original notion of pushing away from the Light that turns into a desire to be together. Orbits are codependent relations. We try to figure out what gravity is without asking ourselves why we might want to be stuck here in the first place. The opposite pole of gravity is the expansive and dissipative tendency of kinetic energy -- what we often call inertial motion or kinesis. The two tendencies are also 90 degrees out of phase. Gravity draws in to a singularity, while kinesis always moves a body tangent to some circular orbit around a singularity and normal to the gravity vector of that circular orbit. Elliptical orbits have an eccentricity that causes the curvature and radius of the circular orbit to oscillate. The two poles of gravity separate into the two foci of the ellipses. In a gravity system with two bodies there are always two ellipses and four foci, two for each viewpoint. One focus is gravitational, the other one is kinetic. There need not be any physical matter at either of the foci as binary star systems demonstrate nicely. To see how curvature radius changes, select an object and a viewpoint to view it from. Now shift angles to get a different viewpoint. You have moved tangent to some circular orbit around the object in order to get to your new viewpoint regardless of the apparent change in distance between you and the object. The only exception to this is if you head straight for the singularity, which is not possible due to Heisenberg uncertainty when you approach the subatomic scale, not to speak of the Planck scale. When we reach the Planck scale inside the vortex of an electron, we have reached the timeless, spaceless moment of the eternal Big Bang. Space/time from that perspective is undefined.

Electric charge and magnetic push/pull are also normal to each other. They reflect the original viewpoint rotations that occur after the I - to - Not-I split that starts the gravity gravity/kinetic system. So all EM interactions and gravity/kinetic interactions are really variations of the same phenomenon. The difference is only one of scale and viewpoint.

McC has a whole section in his FT devoted to a discussion of energy. Unfortunately he never defines energy for us. The closest he comes seems to be the statement that extraction of energy from an electron stream to create light is "electrons themselves that are being ejected into space." (p. 265.) I do not see how this idea throws much light on

the nature of energy. He seems to deny the existence of the ST idea of energy without explaining why electrons should be ejected into space. I define energy as a potential imbalance created by an observer willfully defining undefined awareness into a viewpoint. Mathematically this is like the way we arbitrarily polarize 0 into 1. This gives you a potential to generate all sorts of binary combinations. Any such definition never really changes the undefined nature. However you can play around in the range of whatever space you create by your act of polarization. We can call that play the experience of consciousness. The definitions are beliefs.

A ball on a table in my second floor apartment has zero potential energy relative to the table, but maybe a meter' s worth of potential relative to the floor, and five meters' worth relative to the ground outside my window. So how much gravitational potential energy does it have? Well, it depends entirely on how I define the extremities of the system I want to play with -- for example, the start point and end point of a ball falling in a gravitational environment.

On page 286 of FT McC has a chart in which he attempts to show how different forms of energy are expressions of his principle of expansion. In addition to not explaining what "relative motion" is, McC does not notice that, like relative motion, energy itself is completely an observer-defined mental phenomenon, just as mass, space, and time are. Objects have no energy or mass until we endow them with such things by defining them into a system of some sort. These are all notions that the observer defines subjectively depending on his selected point of view. They therefore belong to the field of psychology, not physics. The material of physics deals with universal principles that do not change under varying viewpoints and circumstances. That is what I think physicists are trying to say when they speak of "Laws" of physics. Unfortunately physicists usually have no idea where such laws come from or why so they end up talking mostly about their subjective notions of mass, energy, space, and time. These days physicists like to talk of a Big Bang, but have no idea who ordered it and why. I think such questions are not necessarily all that difficult to tackle if we settle down and look carefully at what is really going on. . . . What would one have to believe in order to experience living in a world that came from a Big Bang?

McC bases a lot of his arguments on situations where he says that the current way of doing physics violates the law of conservation of mass-energy. That law is not well understood and only seems to hold for closed systems, just like the law of entropy. Physicists have noticed that QM reveals how conservation of energy is equivalent to saying that the laws of physics are symmetrical with respect to translation in time. In short this is Newton' s third law. Conservation of momentum ends up referring to symmetry with respect to translation in space. We combine these notions to see symmetry in relativistic space/time as conservation of mass-energy.

From the very general perspective of OP we might say that, whereas undefined awareness by definition is not bound by any conservation laws, any system that you define undefined awareness into necessarily becomes a closed system, at least relative to its definition. However, the energy conservation law (and entropy) would only apply to

such a defined system if we define it and leave it alone, undisturbed within a span of time -- that span also constituting a boundary definition. However undefined awareness can always intercede with any defined system from any imaginable or even unimaginable viewpoint beyond the definition of the system. This inherent situation pretty thoroughly wipes out the notion of conservation laws and entropy. Such principles only work within the confines of rigid localized automatons.

Even within a tightly defined space/time you can run things pretty much however you like. Place a marble in a shoe box. Practice tilting the box so that the marble rolls toward you, away from you, to one side or another. Make a little hole for the marble to sit in and practice tilting the box until the marble rolls into the hole and then stays there even when you tilt the box. There is a whole class of games based on this idea. But it is a very general principle. Undefined awareness has no opinion at all. It includes all possible directions. If you want a marble to roll toward you, align your self and your environment (your box) so that the marble rolls toward you. If you want it to roll away, tilt your box for that. If you want the marble to stay in one spot, find or make a nice receptacle and tilt until the marble rolls into it. This is a little trickier than just rolling the marble this way or that, but not really all that hard. When your marble is fixed in place, other marbles you may add will still roll about. You can even tilt without a hole until you cancel out all the marble' s motions and then hold the box very still. This is how a martial arts master can keep a bird unrestrained within in his open palm, but the bird can not fly away. It is much trickier to do this with more than one unrestrained bird or marble, but can be done with the right approach. There is a challenging class of games that pose such goals. A fridge magnet sticks to the side of an iron fridge door, but not to a piece of glass or plastic or even a cardboard box. Fasten a round magnet disk to your box and slide another one around by tilting the box. Depending on how you orient the magnets you can make your loose disk either stick to the fixed one or avoid it.

My purpose in this review has been to give a constructive critique of Mr. McCutcheon' s effort. I think his **Final Theory** has many problems, but so have the Standard Theories. However, ST has lots of precise calculations and data. If McC wants the scientific community to take his ideas seriously, he will have to provide quantitative data and expand his theory to model the many important areas of physics that I mentioned, including detailed electron orbits, atomic and molecular structures, phase conjugation, neutrinos and quarks. In his whole book he only calculates one original number -- his atomic expansion constant of Xa = 7.7x10^-7 s^-2. He uses Galileo' s constant acceleration equation d = a t^2 / 2, where d is the distance an object falls. For 1 second he gets a / 2 = (9.8 / 2) m/s^2 = 4.9 m/s^2. He uses an earth radius of 6.37x10^6 m. The ratio (4.9 m/s^2) / (6.37x10^6 m) comes pretty close to his Xa value. Then he devises a formula for taking into account the various relative changes involved in expanding bodies. Unfortunately he only gives us one example applying that constant: his calculation of atomic hydrogen' s expansion (pp. 192-193). (We can not use his argument about the tunnel through the earth, p. 105.) To find G in terms of a hydrogen atom' s radius and mass McC uses the formula R^3 / Xa = G M, where M is a proton' s mass (1.67x10^-27 kg) and R is the hydrogen radius (5.29x10^-11 m). He gets G =

6.8x10^-11 m^3/s^2 kg. McC' s constantXa seems to function rather like G in Newtonian calculations. It is a universal constant applied to local variables. Unfortunately McC does not seem able to propose a good test we could actually perform that would distinguish his expansion theory from standard Newtonian theory. His expansion stands in for Newton' s gravitational force. It is still mysterious and inexhaustible. And there is nothing we can do about it. He even denies the possible existence of anti-gravity.

OP on the other hand provides a comprehensive theory of where gravity comes from and why. OP provides a clear understanding of both gravity and antigravity. It also provides a means for us to manipulate gravity and to manipulate our physical experiences within the context of gravity. McC seems to think that gravity is based on relative size. OP agrees with McC that notions of mass and force are illusory. However, OP holds that density is a property that is directly observable and relates in a quantifiable way to gravitational phenomena. McC therefore misses the opportunity to consider the principles and technology of density modulation.

I also think McC should include a theory of consciousness. I agree with many of his criticisms of ST, including his idea that the strong force should not be necessary (his reason being that charge does not exist, so nothing is needed to hold the nucleus together). But McC definitely needs to account for how a nucleus without charge stays together and give us a model for the weak interaction and the production of neutrinos.

OP has some challenges to face as far as it has evolved, but it also offers some remarkable contributions. For example, OP derives new universal constants that demonstrate how an observer generates his illusion of space and mass. OP also predicts a specific unitary particle, calculating its mass and properties in three distinct theoretical ways. Two of these methods turn out to be equivalent via work done by Niels Bohr on the fine structure constant (another detail ignored by McC.) OP suggests detailed internal structures for the proton, neutron, and electron that we can test in the lab. OP also suggests how detailed study of the proton will help us to verify the existence of the unitary particle (a sort of Higgs particle.) OP provides enhancements to relativity theory that open the door to understanding the important new field of superluminal physics. OP provides an enhancement to quark theory that greatly simplifies the study of the subatomic realm. OP also provides a detailed geometric model of gravitational systems and a profound foundation for thermodynamics, a subject barely touched on in FT. OP provides an extremely elegant way of handling EM field theory as a projection of consciousness. At the same time, however, it shows how we can often use the models of ST as is. The purpose of OP is not to replace ST but to solve some of its problems and also to enhance and upgrade it, building on the brilliant insights and achievements that brought us this far. For more detailed descriptions of the inner structure of electrons, positrons, protons, and neutrons, see my various articles posted at dpedtech.com and read the larger collection of articles in the volume entitled **Observer Physics**.

Palmer' s new Avatar technology (first introduced in 1987) not only provides a way of

exploring consciousness and handling psychological issues, it also lays a firm foundation for the evolution of physics and inspired many of the insights of OP. (Of course that does not make Palmer responsible for any mistakes I may make.) So far the only major problem I have noticed with Palmer's technology is that he is so low key about it that not many people have heard about it and even fewer have explored it. But the study of consciousness is definitely on the rise in various quarters, so we will see where we go from here.

One statement by McC worries me. After mentioning some predicted differences between his gravitational theory and ST, he says (98-99), "There is no particular need to conduct elaborate experiments to attempt to measure any such subtle discrepancies from current theory, and to try to figure out what such discrepancies mean. There is no longer any room for uncertainty and doubt since *Expansion Theory* clearly shows the mechanism behind falling objects . . . ." This sounds like McC is promoting a new religion of The Final Theory rather than a science based on agreement between theory and experiment.

I suppose the main point to all my comments on McC's **Final Theory** is that I believe there is no FINAL theory unless somebody really believes in one. A theory is a belief system. We can explore our current beliefs testing them against our experiences, and we can experiment with new ones. This can lead to interesting discoveries, and perhaps the FT will lead to some discoveries. There is no limit to what is possible other than the limits we place on ourselves. A theory is just such a limit. Maybe McC believes that in the future there will be no more new theories that go beyond his. Do you believe that? A perfect theory is a belief system that exactly matches experiences. If every experiment I perform validates my theory, that only means that I have honestly and precisely described my current belief system. According to OP I can choose any theory I like and make a world that perfectly matches that theory simply by REALLY believing in that theory. That gives me a universe of one. Whether anyone else wants to join me in that world is another question. Of course, I can REALLY believe that many others will join me in that world and that will become part of the theory. Acceptance by others of that world will constitute validation of such a theory.

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* Note: An object at rest has three orthogonal axes from which to initiate rotational motion. You can rotate a book about an axis that runs from top to bottom, or an axis that runs from spine to right margin, or an axis that runs from front cover to back cover. However, any rotation occupies two dimensions. Once you initiate a primary rotation, you use up two dimensions and only have one dimension left to work with. A third type of rotational motion called nutation is a bouncing or vibration in the secondary rotation caused by the momentum of the secondary rotation overshooting the equilibrium point established by the speed of the primary rotation. Usually it is too small and rapid to see with the naked eye in a gyroscope or top and damps out due to friction. Earth's rotation has much less friction than a top, so the nutation damps very slowly.