Think About It
Exploring the questions that make us divine
Acknowledgement

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The Golden Rule

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I start out my mornings like most people I guess, with a cup of
coffee and the newspaper. Of course, I really don’t read the paper
because I don’t have the time. I scan it. I look at the headlines and pick
out the articles that interest me. Most days it’s just an exercise in turning
the pages, but occasionally, I come across an article worth reading. I
came across one just the other day: “Scientists on trail of physics' Holy
Grail.” It was about Fermi Lab; the big atom-smasher in Batavia, Illinois
and how they think that they’ve found evidence of the Higgs boson.

Now truthfully, I have no idea what a Higgs boson is, but for some
reason I found myself reading that article. Why, I’m not a theoretical
physicist? I really don’t understand the stuff these guys work on, so why
should I care? Why did I read that article?

I may not be a scientist, but I know that these guys are trying to
figure out how the universe works. They’re trying to explain how the
universe got here, and that fascinates me because I want to know too. I
want to know where I come from, how I got here and why. I want to
know the truth, not some made up story, but the truth. And, I’m hoping
that the things that they find will help us figure that out.

When I first set out on this project, I thought it was going to be like
organizing my sock draw. I was going to take all the things that I knew
to be true and match them up with all the things that I believed to be true.
Then I could roll them together in tight little bundles and neatly place
them in my sock draw. After that, I could sit back and say to myself,
“Doesn’t that look great. That’s everything I know and everything I
believe all in nice neat rows. It’s who I am, and what I’m all about.”
But much to my surprise, it didn’t work out that way.

In truth, when it comes to the eternal questions, the really big
questions of life, there’s not a lot that I know. Now when I say; “I don’t
know,” I actually mean; “We don’t know.” The human race that is,
doesn’t know. There are plenty of theories, some really good theories, some theories that might eventually turn out to be correct, but in the end, they’re just theories. There is no indisputable, absolute and definitive proof. No one knows how the universe was created and how life emerged on earth, and without question; no one, absolutely no one knows why. It’s all just speculation, conjecture and theory.

After I finished all the sorting and matching, I discovered that I really have only one pair of socks. Just one pair, that’s it. It’s a nice pair, it’s a very comfortable pair, but it’s only one pair. All I really know is that the universe was created, and what I believe is that God created it.

To tell you the truth, it’s a little disheartening because I still have a pile of socks that needs to be sorted. I have to spend a lot more time analyzing the things that I think I know, and give more thought to the things that I think I believe.

What’s worse is that my sock drawer is practically empty. There’s only one pair of socks in it. The rest of it is empty. It represents the potential of what I could and should be, but am not. But that’s ok. Really, it is, at least I know now what I have to do.

As I said, I’m not a physicist nor am I a philosopher. In fact, I’m not a scholar of any kind. I’m just a regular guy that goes to work, coaches little league and soccer, and teaches Sunday school. So you really can’t consider this a serious work. That’s not to say that I’m not serious about it. It’s just saying that it would never be able to stand-up to the rigors of an academic peer review. But that’s probably a good thing.

Because I’m not an academic or scholar, the rules really don’t apply to me. I can speculate and wonder about things without having to worry about ruining my reputation because I don’t have one. I’m free to let my intuition, imagination and heart lead me to my conclusions about
God, as opposed to the absolute verifiable scientific evidence, of which there is none.

So, what’s the point, why even bother? Why spend so much time, energy and effort searching for something for which there is no proof? In fact, doesn’t the question of God’s existence seem to have run its course?

Think about it. We have Muslims, Christians, Jews, Buddhist, Hindus, Agnostics, Atheists and everything else in between, all saying that their ways the right way, or that their God is the true God. And hasn’t that caused enough trouble in the world? Isn’t it time to give it a rest and move onto something else? Why is searching for God so important anyway?

The question of God’s existence is still relevant and important because it is the search for the truth. And the truth is something that can’t be spun or manipulated to promote any particular belief, religion or political ideology. The truth, whatever that turns out to be, is true because it’s true, and for no other reason than because it’s true. It is self evident, compelling and undeniable. And ultimately, it’s the coming to terms with the truth that liberates us both individually and collectively, and enables us to actualize our true potential.

In the end, there are only two possibilities; either God exists or God does not exist. However, what I discovered in writing this is that the answers aren’t nearly as important as the questions, because it’s the questions that are going to enable me to finish sorting my sock draw. I bet if you’re honest with yourself and thought about it, your sock draw could use a little sorting too.
I was heading up to bed when my 12-year old son Patrick called out to me, “Dad!”
I entered his room and found him lying in bed with the lights off, “What’s-up?” I asked, “Why aren’t you asleep?”
“I was just thinking,” he said.
I hesitated, “Really! About what?”
“Well, you know how everything has to come from something?”
“Yeah, I guess so.” I replied cautiously, “Why?”
“You know, like how I came from you and Mom – right?”
Panic paralyzed my mind. This is it, I thought. It’s the birds and the bees talk. Please Lord! I’m not ready for this!
He continued, “Well if everything has to come from something, then where did God come from?”
Relief set in and the butterflies started to leave my stomach. I sat down on his bed. “That’s a great question Buddy! What made you think of that?”
“I don’t know,” he replied, “I was just kind of thinking.”
We talked about it for a couple of minutes, and I fumbled through my answer. “God is the first cause.” I said, “The only thing that always has been and always will be.” I knew he wasn’t satisfied with my answer, but it was the best I could do at eleven o’clock on a school night. I gave him a hug, turned out his lights and went to bed.
What a great question for a 12-year old boy to ask. What a great question for anyone to ask. What an insightful, thoughtful and intelligent question. I wish I could take credit for it. I wish I could say that it was my expert parenting that’s instilled this sense of wonder and curiosity in my son, but I can’t.
The need to know: the need to understand the how and why of things, is something that is uniquely human. Why do apples fall from
trees? Why does the sun rise in the East and set in the West? Why is the sky blue? How do birds fly? Where does all this come from? This curiosity, this need to know, is something that is inherent in all of us. It’s part of our nature.

When I was Patrick’s age, I was taught that what made man special, what set us apart from the rest of the animal kingdom, was that humans were tool using animals. Then of course, Jane Goodall observed chimpanzees fashioning tools out of twigs to fish for termites, and that definition got tossed out the window.

Today, they say, that what makes humans special is a highly developed brain capable of articulate speech and abstract reasoning, and I guess that’s as good a definition as any. After all, isn’t it, our abstract reasoning and our innate desire to understand both ourselves, and our place in creation that makes us, uniquely human?

The question; “Who am I and where do I come from?” is probably the very question that ushered in the first human being. Think about it. At some time in our ancient past, one of our early ancestors had to be the first one to ask that question. Whenever that was, is when I think the first modern human emerged. And, from that moment on, the history of the human race has been one continuous quest to answer that most fundamental question.

Almost every culture on earth has some kind of creation story that attempts to answer that question, and explain how the earth and all its creatures came into existence. These stories typically start with a first cause. That’s some type of supreme-being or beings, that set in motion the events that created the world. Some stories talk about a giant crab or turtle that brought forth the earth from a primeval ocean. Others have dismembered giants, or rival gods doing battle to bring order to chaos.
Today, we tend to dismiss these stories as simple fairytales, made up to help primitive minds make sense of the world around them, but we shouldn’t do that. These stories are important because they have influenced the evolution of human culture by providing a frame of reference, which man has used to help define his role in creation. Over time, these stories took on structure and form, and evolved into what we generally know as religion.

Traditionally, religion provided the answers to those fundamental questions. Throughout the dark and middle ages, religion was the dominant influence that rightly or wrongly, guided human society. Then, during the 14th century, Europe experienced a re-birth, a renaissance of philosophy, art and science that dramatically changed the way man viewed the universe, and explained the natural world around him. Today, most of us look to science for the answers to those fundamental questions.

So, how does science answer Patrick’s question? Where does science say we come from? The generally accepted answer is, “a singularity.” According to the Big Bang Theory, our universe expanded into existence some 13.7 billion years ago, from a singularity; an infinitely small, infinitely hot, and infinitely dense point.

Singularities are thought to exist at the center of black-holes. They are points in space where the gravity is so strong, that nothing can escape, not even light. All matter gets squashed into an infinitely dense point.

Now, the idea that our universe expanded from a singularity, is hard to comprehend for a couple of reasons. First, it’s really difficult to conceptualize a singularity. A point that swallows up matter and light, how’s that possible? Where does the light and matter go? Second, it only begs the question: “If there was nothing before the Big Bang, then where
did the singularity come from; what was there before the Big Bang?”
The answer is an equally incomprehensible, nothing! There is no before prior to the Big Bang. Time was created with the Big Bang, and without time, there is no before.

The Big Bang is the beginning; not only the creation of time and space, but the creation of all the forces in the universe, and all the fundamental laws that govern those forces. Our physics did not exist before the Big Bang because there was no before.

Right now, science can’t tell us what happened before the Big Bang because it needs physics to do that. I say “right now,” because the physics we have today can’t explain what came before the Big Bang. That’s not to say, that there isn’t a new set of physics waiting to be discovered that could. I guess that’s possible. Einstein did it. Who’s to say that there isn’t some budding young Einstein out there ready to usher in a new era of human understanding? It would actually be pretty neat. However, just because science is currently pressing the limits of our current physics, doesn’t mean it’s unable to speculate, or even develop theories about what came before the Big Bang. Membrane Theory or M-Theory, for example, suggests that our universe might be part of a larger universe or a megaverse.

What’s M-Theory? Imagine several clotheslines set up in your back yard. On each clothesline is a bed-sheet, gently swaying in the breeze. Each of these bed-sheets represents a membrane, or universe. Occasionally, the sheets bump up against one and other, and when they do, the energy released from the collision creates a new sheet, a new universe or new membrane.

M-Theory is relatively new and not yet fully understood. In fact, science might even need to develop a whole new mathematical language in order to explain it. I can tell you this, it certainly not going to be any
language that I understand, but I really hope they can do it. And even more, I hope they can figure out a way to test it. It would be disappointing if they couldn’t. Hopefully, like most things in science, it might just take a little more time and technology to figure out.

Another possible alternative to the Big Bang Theory is Loop Quantum Gravity. Loop Quantum Gravity is a theory that attempts to explain gravity. It’s difficult to explain without using very complex mathematical terms. And to be honest, I haven’t a clue as to what any of it really means. But, the basic idea is that another universe existed before ours, and that our universe was created not in the Big Bang, but in the Big Bounce.

Think of the universe as an accordion. Every time the accordion gets compressed, it bounces back into the expanded position, creating a new universe as it does. It’s a fascinating theory, but, even if true, it doesn’t really answer the question; “What came before?” Unless of course, the answer remains nothing; the universe is all there is, and it just keeps expanding and contracting forever.

What’s interesting about these theories is that they suggest a possible first cause that lies outside of our current universe and our known reality. Whether it’s multiple dimensions, cosmic membranes, or some other universe; they begin to consider the possibility, that there is more to reality than just the physical universe that we live in.

Why is this significant? It’s significant because these theories begin to move us away from the reductionism that has dominated science for the past four centuries.

What’s reductionism? Well, reductionism is simply an approach to understanding things. It’s the idea that complex systems like; animals, people and even the universe are nothing more than the sum of their parts. It basically says that you can take something apart, and by studying
the individual pieces and seeing how they fit together, come to understand the thing itself.

Reductionism has been an extremely powerful methodology, and is responsible for tremendous advancements in all the sciences. The problem with the Reductionist approach, if there is one, is that it assumes that what you see is all there is. In other words, our physical universe is made up of pieces and parts, and there can’t be anything outside of it, because only the piece-parts inside count.

It’s kind of like being a clock-maker, but having no idea of what time is. You can know all about the gears, springs and inter-workings of the clock. You can even fix the clock if it breaks, but you still have no idea as to what the clock actually does and why.

Reductionism has been truly magnificent, a testimonial to the power the human intellect. It’s given us a tremendous insight into understanding our universe. But what if there is something else? What if multiple dimensions, cosmic membranes or something else really does exist? What if there really is something outside our universe that somehow influences and affects our reality? Is the reductionist approach going to continue to work, or are we heading down a dead-end? Maybe, it’s time to consider a new approach. If we don’t expand our search and our science, if that’s even possible, are we ever going to find the answers?

Science is based on the premise, that there is a logical, orderly and unchanging nature to the universe, which human beings are capable of discovering and understanding. That’s what science does; it seeks to understand that nature.

What’s interesting about some of these new scientific theories is that they are theoretical. In other words, they are based almost entirely on mathematics, and not on observations. That’s somewhat different
than Sir Isaac Newton observing an apple falling from a tree and then developing an explanation for why it falls. These new theories are more like Einstein’s thought experiments. They’re products of both the human imagination and intellect.

It’s amazing. We’ve gone from creation stories to cosmic membranes; explanations of the universe based on folklore and mythology, to ones based on advanced mathematics. Have we come full circle? Is science beginning to discover what our ancestors intuitively knew, that there’s something more out there?

If you think about it, aren’t science and religion really after the same thing? Aren’t we kind of like Dorothy in the Wizard of Oz, trying to figure out who the man behind the curtain really is? Isn’t this what keeps a 12-year old boy up a night asking, “Where does God come from?”

It’s a fascinating subject, one that will continue to consume the attention of physicist, philosophers, theologians, and even 12-year old boys for generations to come. But when you get right down to it, aren’t there really only two possibilities?

The universe is either rational, or it isn’t. There are either reasons why the laws of nature work the way they do, in controlling the physical universe, or there are no reasons. Human beings are either capable of discovering and understanding those laws and the reasons behind them, or we’re not. And ultimately, there is either an intelligence behind those reasons, or there isn’t.

Intelligence is kind of an ambiguous term. It could mean just about anything. So, why not just come out and say it, just call it what it is, God? We can do that, but we have to be careful. The word God means a lot of different things to a lot of different people. It’s important to keep an open mind and not let our preconceptions get the better of us.
So for now, when we talk about God, we’re simply referring to the intelligence behind the universe. Ok then, God is the intelligence behind the universe, whatever that means.

When we define God as the intelligence behind the universe, the question becomes: Did man invent God or did man discover God?

Let’s consider the possibility that man invented God. If man invented God, then there is no intelligence behind the universe. God is simply a creation myth that we invented to help explain something that we really just don’t understand. So, what would that mean?

Well, it would mean that the universe itself is the only thing that has always existed, and in all probability always will exist. Now, this doesn’t necessarily mean that our universe, the universe we currently live in has always existed. Our universe still could have started 13.7 billion years ago, but some other mega universe, or big bounce universe has always existed. But that’s it, that’s all there is.

If there is no intelligence behind the universe, the cosmic membranes, or whatever, they are, are just there. Occasionally, they bump into each other and create new universes. One of these collisions just happened to create our universe, a universe with all the right ingredients to evolve intelligent life. But again, if there is no intelligence behind it, it just happened.

British mathematician Rodger Penrose actually calculated the probability that the universe just happened, or was created by chance. The number is so astronomically small I don’t even think it has a name. It’s 10 billion to the 123rd power to one. That’s 10 billion times itself 123 times, to 1. You’d have a better chance of hitting the jackpot on every single slot machine in Las Vegas at the same instant. It’s not going to happen. It shouldn’t happen.
There are those who will jump on this saying; “That the probability is so small that there is absolutely no way that our universe could have been created by accident. There has to be some intelligence behind it, guiding the process. There has to be a God.”

Now, I’ll agree that the probability has to be infinitesimally small, but it doesn’t mean it couldn’t have happened this way. The probability is infinitesimally small to us because, we think linearly. In other words, we think in terms of time; for us there is always a beginning and an end, a before and after to everything. But remember, time was only created 13.7 billion years ago. If you remove the element of time, you suddenly create a condition where all probabilities can indeed exist simultaneously, and what once seemed to be improbable, now becomes not only possible, but nearly certain. So, it’s possible that our universe could have been created by accident. But still, what does it mean?

What it means is absolutely nothing! Our universe is the way it is because it is. There is no intelligence behind it, and no reasons behind the laws that govern it. Any attempt to read anything more into it, is just a waste of time. Without any intelligence behind the universe, it has no meaning. In short, the universe simply exists. The universe exists without purpose. And if there is no purpose to the universe, then there is no purpose to anything in the universe. That’s it, end of story.

Now, some people could argue, that although there is no intelligence external to the universe, intelligence exists within the universe, and that intelligence is capable of assigning its own purpose.

I guess that’s possible, providing that we are willing to assume that role. Ok! Let’s assume that role. We’re the intelligence that assigns purpose and meaning to the universe. What does that mean?

It means that Man now assumes the role of God. But that’s ok! Seriously, it is. Providing that there is no God; we’re the smartest, we’re
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the most evolved, so we get to decide what it all means. We get to assign purpose and meaning to creation.

So, in effect, we have a purposeless being assigning itself purpose. Aren’t we just kidding ourselves? Isn’t that just as self-delusional as trying to ascribe creation to a God if there is no God? Yeah, I guess so, but somebody has to do it, right? Ok, we get to determine the purpose and meaning of creation, and everything in it. So, what type of purpose and meaning are we talking about?

Think about it. Any purpose or meaning that man assigns, is really only going to be a reflection of himself. Seriously, how could it be any other way? The purpose and meaning we assign to creation, will assume our own characteristics and attributes. So, what are these characteristics?

Well, we know that man is a temporal being. That is, assuming the reductionism is right, and we’re just atoms and chemicals, and there is no such thing as an immortal soul, we don’t last forever. We’re here for 80 or 90 years at best, and then we’re gone.

We also know that we are an evolving being. Man has evolved over time, and in all likelihood will continue to evolve. So, we change.

And finally, we’re flawed. I know we’ve all met plenty of people who think they’re perfect. I’m sure that my kids would tell you that on occasion I’m guilty of making that claim, and I probably am, but like it or not, I’m flawed. All human beings are flawed. We’re all flawed.

So, man is a temporary, ever changing and imperfect being and any purpose or meaning we assign the universe will be in a state of flux, forever changing and forever evolving. There is no permanence to it or anything. There is no universal truth, no higher moral authority or morality, and ultimately, there is no right and wrong.

What we are left with is the “morality of might.” If you have the power to force your will on others, you get to decide what’s right and
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wrong. Come to think of it, isn’t this pretty much what we have today; survival of the fittest, social Darwinism? Kind of explains a lot, doesn’t it?

Now, let’s consider the other possibility: that there’s a man behind the curtain and there is some kind of intelligence behind the universe. What would that mean?

Well, if there is indeed some intelligence behind the universe we can probably conclude that it had a purpose or reason for creating the universe. We can conclude this because any action that has some type of intelligence behind it, by definition has some purposeful intent. The very presence of intelligence denotes intent.

So, if there is an intelligence behind the universe we’re out of the God business. We don’t get to assign a purpose and meaning to the universe. That’s a relief? Still, we get to assign a purpose and meaning to how we live, and what we do, but we really can’t determine the purpose for our being created. That needs to come from something bigger than ourselves.

Here’s the good part; if the intelligence behind the universe had a purpose or reason for creating the universe, then we the intelligent beings it created, get to try and figure out just what that purpose really is.

I’m not saying that we can figure it out. I’m not even saying that we’re capable of figuring it out. But we get to try, and isn’t that really what it’s all about? Isn’t that what science is trying to do? Figure it out, put together the pieces of the universal jigsaw puzzle, and answer those fundamental questions?

If there is an intelligence behind the universe, everything suddenly takes on a new relevance. Every new scientific theory, every new
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subatomic particle that comes spewing out of a particle accelerator has some special meaning and purpose that we get to try to figure out.

It’s intelligence that allows us to seek, explore, and ask the questions that help us figure things out. And we are intelligent because we seek, explore, and ask questions and try to figure things out. Either through an accident of evolution or by the divine intent of the creator we are designed to seek the truth. Twelve year old boys lie awake at night pondering where God comes from because that’s what they're designed to do. We ask “Who am I and where do I come from?” because it’s what we’re supposed to do.

If there is a God, then the universe exists for a reason, and we exist for a reason. They say that only like can know like. Well, if there is an intelligence behind the universe, then we can seek out and know that intelligence because we are intelligent. If there is an unchanging and orderly nature to the universe, then we should be able to discover it. If there is a reason or purpose behind it all, then we have to try to figure it out. If there really is a man behind the curtain, then we’re supposed to try and find him.

There aren’t 6 billion reasons why we exist. There’s one reason why 6 billion of us exist.
There’s a story that my mother likes to tell that has become folklore in our family. It’s about her Grandfather, “Big Mike” Bresnan. His last name was actually Brosnanhan, but somewhere between Castle-island, Ireland and Boston, Massachusetts, an immigration official decided to change it. Anyway, Big Mike came to America when he was only 17-years old, got married, had a bunch of daughters and became what else, a cop. He had managed to save up a little money and wanted to invest in something. One of his daughters, my Aunt Catherine, happened to be engaged to a stockbroker named Leo Gillespie.

“Big Mike, you might want to consider investing in Coca-Cola. I think it’s really going to go places,” advised Leo. “Forget it!” replied Big Mike, “Moxie’s here to stay!”

There is no such thing as a sure bet. The only thing certain in this life, other than death and taxes of course, is change. Being closer to fifty than to forty, I often tease my kids about how easy they have things today. “When I was your age, we didn’t have video games. We had a black and white television that only got five channels, and we actually had to get up off the couch to change the station.”

Of course they laugh. Heck, I laugh too. We watch the History Channel together and the things that are ancient history to them were current events for me. When I think about my parents and grandparents, and the changes, they saw during their life times, it’s truly remarkable.

My Grandfather was born two years before the Wright brothers flew their first airplane and lived long enough to see Neil Armstrong walk on the moon just 66-years later. I remember him telling us stories about his older brother Johnny, who left home as a teenager to become a cowboy in the Oklahoma Territory; not the State of Oklahoma mind you, but the Territory!
It’s amazing. We went from buckboards to Buck Rodgers during my Grandfather’s lifetime. The advancements we made in science and technology during the Twentieth Century are nothing short of astounding.

There were more scientific breakthroughs and technological advancements during the 20th century than in the combined 6,000 years of human history that preceded it.

In every field imaginable, we pushed the limits of human understanding. And the standard-bearers, the ones paving our way into the future are the scientists; the theoretical physicists, cosmologists, mathematicians and chemists. The incredible minds that figured out how things work; the big things and the small things, everything from the fundamental particles of matter found inside the atom to the universe itself.

Science’s contribution to the advancement of human understanding cannot be over stated. Sure, science has given us laptops, I-Pods and cell phones; but that’s not what I’m talking about. The scientific advancements made during the 20th Century have literally changed the way we perceive reality. Two such perception-altering discoveries that occurred during my Grandfather’s lifetime were the theories of General Relativity, and Quantum Mechanics.

When we hear “Relativity” we instantly think of Albert Einstein. Now most of us, and I include myself here, really don’t have a clue as to what this is, but we know it has something to do with Einstein.

We’re all pretty familiar with the elder Einstein, that gentle old man with the walrus-like mustache and crazy white hair. However, in truth, Einstein’s greatest work, his real contributions to science were all made before his 28th birthday! Between 1907 and 1915, Albert Einstein
published a number of papers that led to perhaps one of the greatest discoveries of the 20th Century: The Theory of General Relativity.

General Relativity is a theory of gravity that gives us a totally new way of looking at, and conceptualizing space and time. General Relativity explains how the biggest things in the universe work; things like the planets, stars, galaxies, and of course the fundamental force that governs them, gravity.

The second revolutionary discovery made during my Grandfather’s life was Quantum Mechanics. Well, actually Quantum Mechanics or Quantum Field Theory first emerged in the mid 1800’s, and kind of evolved over the next century with contributions from numerous people.

Quantum Mechanics explains how the smallest things in the universe work; the things inside the atom; the little fundamental particles of matter that make up everything in the universe, and the forces that govern them: electromagnetism, and the weak and strong nuclear forces. These three forces, along with gravity, are what science calls “The Four Fundamental Forces of Nature.”

Einstein didn’t particularly like the idea of four separate forces. He intuitively believed there was really only one force and that the four fundamental forces were merely offshoots of this one unified force. To his dying day, Einstein worked to discover what he called the Unified Field Theory; a single theory that would unite all four forces.

Now, I use the term “discover the theory” because that’s what scientists really do. They don’t actually invent theories, they discover them. Theories are models that describe how something works. The universe works the way it works because it does, and not because of anything we do, invent or even discover. Even if Sir Isaac Newton or Albert Einstein had never been born, gravity would still cause apples to fall from trees, and the earth to orbit around the sun. However, without
minds like Newton’s and Einstein’s we may not have a clue as to what gravity actually is, or how it works; but there would certainly still be gravity.

The scientific minds that discover and develop these theories are truly remarkable. I wish I could say that I’m envious, but honestly, I don’t know enough to be envious. I’m simply in awe. Like most of us, I can get a general sense of what these theories say but when you get into actually conceptualizing what the formulas and equations mean - I’m lost.

I imagine that a theoretical physicist must view nature much like a composer hears music. A composer can literally hear the music in her head and then put the notes down on paper or, conversely, see the notes on paper and hear them in her head. Again, I can only imagine, but a theoretical physicist must have the ability to look at the universe and see it in terms of elegant symbols and equations, or look at the symbols and equations, and see it as the phenomena of nature. What a gift!

Although Einstein never discovered his Unified Field Theory, it pretty much remains the holy grail of science. In fact, it has continued to evolve into what is now referred to as the Theory of Everything (TOE). Seriously, that’s what they call it, the Theory of Everything; a single theory that would link all the known physical phenomena in the universe. It would tie together the Classical Mechanics that Newton discovered with Quantum Field Theory and of course General Relativity.

Science is making tremendous progress and may even be closing in on the Theory of Everything. They’ve pretty much unified the three quantum forces. During the 1960’s, physicists came up with a theory that predicted an electro-weak force that combines electromagnetism and the weak nuclear force. Today, they even have a Grand Unified Theory
that adds the strong nuclear force into the mix, but they’re still waiting to test it.

See, that’s how it works. Scientific theories predict things and then scientists test them to see how good they work.

Theoretical physicists test their theories in particle accelerators. Particle accelerators are massive machines; giant racetracks that use powerful magnets to accelerate subatomic particles to near the speed of light, and then smash them into each other. It’s kind of like subatomic bumper cars. After the collisions, physicists look at the pieces and see how good their predictions were.

Particle accelerators can re-create the birth of the universe. Well, actually they re-create the conditions that existed in the early universe when things were incredibly hot, and when physicists believe the four fundamental forces were still unified.

Scientists have confirmed the existence of the electro-weak force but haven’t had an accelerator powerful enough to test the Grand Unified Theory, although, that might soon change.

In September 2008, the new Large Hadron Collider (LHC) opened just outside of Geneva, Switzerland. The LHC is the most complex machine ever built. It cost over $10 billion and is 16.5 miles long with 1,600 27-ton super conducting magnets, and is so big, that it takes two countries, Switzerland and France, to hold. Physicists believe it will be able to re-create the conditions that existed when our universe was a mere hundredth of a billionth of a second old, and still only about the size of a football.

Thousands of physicists from all over the world will be heading to Geneva to smash stuff together creating; micro black holes, Higgs bosons, and other bizarrely named particles that will hopefully bring us
one-step closer to the Grand Unified Theory, and maybe even the Theory of Everything. It’s actually pretty exciting.

So, will the LHC do it? Will quantum mechanics be able to tie all the pieces together into a Theory of Everything? I have no idea, but I know that Einstein had his doubts.

We all know that Einstein is most famous for his $E=mc^2$ equation. That’s Special Relativity, but it was his work on Quantum Theory that actually won him his Nobel Prize.

Although, he made significant contributions to the development of Quantum Mechanics, Einstein was never really a big fan of the theory. The problem he had with it was that it was just too uncertain.

See, Einstein believed that scientific theories should be certain. That is, they should be able to make exact predictions that can be tested and confirmed. One of the fascinating things about Einstein was that he initially developed and tested many of his theories with mind experiments, experiments inside his head. That’s how he discovered General Relativity. He published the theory in 1915, but it wasn’t until 1922 that scientists had the technology to put it to the test and of course, he was right.

In the fall of 2003, a group of Italian astrophysicists again put General Relativity to the test. They had a satellite on its way to explore Saturn that was on the other side of the sun. The satellite transmitted radio signals back to earth, and the scientist measured the effect that the sun’s gravity had on the radio waves. Sure enough, General Relativity could predict the effect with incredible accuracy; to within 20 parts in a million, a new record, 50 times more accurate than any measurement ever taken before. All these years later and Einstein never ceases to amaze!
Anyway, Einstein didn’t like Quantum Theory because it’s not as certain as General Relativity. See, Quantum Theory doesn’t make exact predictions; it calculates probabilities. In the real world, we can use physics to figure out both the location and the speed of anything.

If I were traveling in a car west along the Massachusetts Turnpike getting off at Exit 7, we would know both my location and speed. I’d be in Ludlow Mass inside a Toyota Mini Van weighing 3,890 lbs. (the van not me) traveling at 65 miles per hour because I never exceed the speed limit. That’s straightforward. Everything in the real world has both a position and a speed, but that’s not the case in Quantum Mechanics.

In Quantum Mechanics, you can never simultaneously know both the location and speed of anything. It’s called the “Uncertainty Principal.”

Imagine a roller coaster with a cart speeding around the track, going up and down hill in a continuous circle. You can determine the speed of the cart by using a stopwatch to see how long it takes to go from the top of one hill to the top of the next hill. Or, you can determine the carts exact location at any instant by taking a picture of it, but you can’t do both at the same time.

In Quantum Mechanics, the location and speed of particles don’t have precise values. The best you can do is come up with a probability of the value. It’s a statistical theory that’s incredibly accurate, but has an element of uncertainty to it.

Einstein didn’t like this uncertainty and had philosophical issues with the randomness of Quantum Theory. In fact, his unwillingness to embrace the theory alienated him from many of his contemporaries. It sparked a debate with Niels Bohr, one of the other pioneers of Quantum Theory, which lasted for decades. Einstein never came around, and never yielded his position that “God does not play dice with the universe.”
Quantum Theory has been incredibly successful. It is the most accurate description of our physical reality ever discovered, but it can also be a little difficult to come to terms with. Although the math is elegant, many of the interpretations are downright weird. Of course, I’m not qualified to give an opinion, but I like the “shut up and calculate” interpretation. In other words, you don’t need to interpret the theory because the math works. Seriously, there are some things in Quantum Theory that simply defy common sense.

In Quantum Mechanics, it’s possible for something to be two different things at the same time. It’s the central concept of Quantum Field Theory called the “Wave-Particle Duality.” It basically says that matter can be both a particle and a wave at the same time. It really doesn’t make sense, because a particle is something that has mass, while a wave is something that has no mass.

So, how is it possible that something could be both? I have no idea. It’s a paradox without any real explanation. I don’t even think there’s a consensus among physicists on how to either explain it, or interpret it.

It gets stranger because the thing that determines if something is a particle or a wave is you or me, or the person doing the observing. It’s another bizarre premise of Quantum Theory, which has fascinated physicists and philosophers for decades. It basically says that some how, through the very act of watching an event, the observer affects the outcome of the event.

Say I wanted to know if a photon was a particle or a wave. What would I do? Well, I’d have to set up a couple of experiments; one to test and see if it was a particle and another to test and see if it was a wave. But, here’s the rub. In the first experiment, I tested the photon to see if it was a particle, and sure enough it acted like a particle. In the second,
experiment, I tested the photon to see if it was a wave, and sure enough it acted like a wave. How’s that possible? How could it be both?

Well, somehow, the very act of setting up those experiments forced the photon to become either a particle or a wave. Somehow, I forced the photon to change states simply by looking at it. It defies common sense, but it’s a phenomenon that’s actually been confirmed in laboratory experiments.

Now, we’re not talking about one of those optical illusions you see in puzzle books: you know, look at the picture this way, and it’s an old lady, look at it, another way and it’s the pretty young girl.

What Quantum Theory is saying is that there is some type of connection, a bond between the observer and the outcome of the experiment. In other words, the observer affects' reality.

Think about that! The observer, the person doing the observing, some how, determines the outcome of the event. The observer determines whether or not something is a wave or a particle. The observer, somehow, affects reality.

What does that mean? Does it mean that there needs to be an observer? Someone or something observing reality to affect it, to make it real? Are we the observer? Do we affect reality, or is it, someone or something else? Does this apply to the universe in general, or just to the universe inside the atom? Does this mean we have the ability to shape and influence our own reality, or is it, someone or something else that does it? It’s absolutely mind-boggling.

Anyway, that’s why Einstein didn’t like Quantum Theory; it was just too strange, too spooky for him to accept. He died in 1955 insisting that Quantum Theory was an incomplete representation of reality. Einstein believed that reality was not a game of chance; it had to make sense, and it had to be rational.
Of course that was over 50-years ago. Science must have figured it out by now? Well, actually, no; theoretical physicists still haven’t been able to eliminate the uncertainty, or resolve the “Duality Paradox” of Quantum Theory. If Einstein were alive today, he and Niels Bohr would probably still be going at it.

So, what’s the big deal? What if Quantum Theory has uncertainty and paradoxes, it works doesn’t it? I mean they can still use it to do stuff, right?

Sure, computers, cell phones and lasers are all products of Quantum Mechanics, but that’s not what Einstein was concerned about. Einstein really wasn’t concerned with the practical applications of science; he was interested in the truth of science. That was Einstein’s religion. He believed that there was an orderly and rational explanation for why the universe worked the way it does, and he wanted to know what that was. It really gets back to the Theory of Everything; the ultimate answer and explanation for everything.

Now, I’m not a theoretical physicist and believe me when I tell you, I will never be mistaken for one; but I like to think that there’s an answer. It might necessitate the existence of some universal quantum observer, who’s in all places, at all times, observing all things from all perspectives, but I honestly believe that there is an answer.

It might not even be Quantum Field Theory that unites all the forces and ends up giving us the Theory of Everything. It might be an entirely new theory. It might be something like String Theory.

What’s String Theory? Well, String Theory is a mathematical model, which replaces particles, those little fundamental bits of matter with vibrating strands of mass-less energy called strings. The basic idea is that strings come in different shapes that vibrate at different
frequencies, and nature can assemble these strings into all the fundamental particles and forces found in the universe.

It’s like a guitar string. You change the sound a guitar makes by sliding your hand up or down the neck along the frets; you strum the same string, but get different sounds or different musical notes.

In the 1980’s physicists began to realize that String Theory might be able to describe all the fundamental particles, and the forces between them. It appears and still does, that String Theory might eventually reveal the set of equations that unites all the forces, and finally delivers us the Theory of Everything.

However, there are a couple of wrinkles with String Theory that may still need to be ironed out. String Theory is a mathematical model; a very complex, very involved mathematical model that strongly suggests, even predicts, that our universe has eleven dimensions.

What do we mean by dimensions? Well, we’re all familiar with the four dimensions that we physically occupy. There is front to back, side to side, up and down and time. Yes time! Time is the fourth dimension. These are the four dimensions that give your exact location in the universe.

If I told you to meet me in the observatory of the Empire State Building on Friday afternoon at three o’clock, you’d know my exact position in the universe.

I’d be in New York City at the corner of East 34th Street and 5th Avenue, 1,250 feet above the ground on the 102nd floor, at 3 PM Eastern Standard Time. These are the four dimensions of the universe that we can observe. It’s where we live and where we experience things. Now, in order for the math of String Theory to work, there needs to be an additional seven dimensions.
Think about that; seven additional dimensions that exist beyond the four dimensions of our universe. Is it like a mega universe of which our universe is just a part? What’s in those other dimensions? Is there life there? Does some type of intelligence occupy them? Are they, parallel universes or something like that? Do they impact or affect our universe?

I don’t know! I guess there could be other dimensions. Maybe they exist but simply lie beyond our ability to observe. If this is the case, it could present a problem because anything that is beyond our ability to observe might also be beyond our ability to measure and test. And, if something lies beyond our ability to measure and test, it could be beyond our ability to know, simply because it lies beyond the boundary of our physics.

See, scientist use physics to acquire knowledge. They measure, weigh, test and time, and if there are things that are beyond our physics, they are metaphysical and could be, at least scientifically, beyond our ability to know. So unfortunately, science may always have some level of uncertainty; a paradox that can’t be explained or a theory it won’t be able to test.

Of course, a scientific theory that can’t be tested isn’t really a scientific theory. It’s more like a philosophy. But, as long as the math works, we can always just accept it as a postulate; something we can’t prove but accept as true on faith.

So what’s the big deal anyway? Why is finding the Theory of Everything so important?

Well, for starters we’d finally have a single theory, a single set of equations that explains the complete formation and evolution of our universe, and the laws and forces that govern it. It might even unlock the secrets of the sun and enable us to generate unlimited amounts of clean,
free energy, or even help increase the average human life span to 250 years. Who knows, the possibilities and practical applications are limited only by our imaginations.

The Theory of Everything would be the ultimate scientific discovery that could potentially change our perception of reality. It would, as Cambridge Cosmologist Stephen Hawking said, allow us to see into “the mind of God” and unlock the secrets of creation.

The science of the 20th century gave us a new perspective of our universe, and an entirely new understanding of our reality. We once looked up at the evening sky and thought of our universe as a vast expanse of nothingness, like air without oxygen. Then Einstein and others, taught us to see space as the fabric of the universe, a tapestry of matter, energy and time.

Once, the universe we could see was all there was. Now, science is exploring the idea of a mega universe with multiple dimensions and cosmic membranes. If you think about it, there’s really something more fundamental at work here. It doesn’t really matter if it’s the Theory of Everything, General Relativity, Quantum Theory or String Theory; this is how science pursues the truth. These theories are science’s way of trying to make sense out of creation. It’s how science helps us understand the universe, and to come to terms with our place in it.

If the universe were a crime scene, the cosmonologist and physicist would be the guys from CSI. They come in and use their science and technology to try and figure out what happened. And, they can actually trace what happened all the way back to the first instant of creation, to what they call the Planck epoch of the Big Bang. To the point in creation where both time and physics began.

As amazing as this is, it’s not good enough because I want to know what came before that. I want to know what came before time, and
before the birth of the universe. Again, maybe this lies beyond the reach of science, and beyond what we can scientifically know, but I’m fascinated by the idea of what might come popping out of that new particle accelerator in Switzerland. Science is literally taking us back to the very beginning of time, back to where the physical and meta-physical are unified.

Historically, science has not concerned itself with the metaphysical; that’s not its job, nor its responsibility. But like it or not, the 20th century delivered science to the doorstep of the meta-physicists. The quest for the Theory of Everything has put the theoretical physicist in the same classroom as the philosopher and theologian.

We have scientific theories with paradoxes that can only be resolved by some sort of universal cosmic observer that is in all places at all times observing all things from all perspectives. And, this universal quantum observer needs to be not only in the four dimensions of our space-time, but also in the additional seven dimensions of String Theory, in order to influence and direct the evolution of our reality.

Is it, me, or does this job description sound familiar? Are we closing in on the perpetrator? Could science be looking at the fingerprints of a creator?

The science of the 20th Century gave us so much new knowledge, but towards what end? We certainly know a lot more than the people did at the turn of the last century when my Grandfather was born, but are we any different? Not just are we better off, but are we better? Has this new knowledge helped us change?

Without a doubt, we have evolved intellectually, but have we evolved emotionally or spiritually? Would discovering the Theory of Everything help change us? Would it help us evolve? Would it make us better human beings?
The Universal Quantum Observer

Maybe it’s time to start using this knowledge to help us develop a new perspective on the whole of creation. You know; the big picture. Maybe it’s time to seek a new a more comprehensive understanding of ourselves; who we are, where we come from and why we’re here? Do we have a role and function to play in creation, or are we just along for the ride? If we have a role, what is it? Are we alone in the universe, or is there something else out there? Is there really a universal quantum observer; an intelligence behind the universe, a creator? If there is one, are we supposed to try and find it?

The truth’s out there and certainly science plays a pivotal role in helping us find it, but can science alone provide all the answers?

I don’t know. We’ll have to see where the science of the 21st century takes us. Wherever it is, one thing’s for certain: it will be different from where we are today. I don’t know if the world my grandchildren inherit from me will be better than the world I inherited from my Grandfather, but it’s sure to be different.

My hope is that the science of the 21st Century will yield us a more comprehensive understanding of creation, and in doing so, provide us some deeper insight into the mind of the Creator, if indeed there is one, and into our role in creation, if indeed there is one.

Unfortunately, I don’t believe that science will ever be able to conclusively prove or disprove the existence of the Universal Quantum Observer. I don’t really think that it’s a question for science alone to answer. I think it’s a question that we each must answer for ourselves. I believe that it’s the one question on which we cannot remain neutral, and it’s the one decision that we cannot abdicate because it’s the one answer that absolutely defines us.
There has to be a reason

When I was in college, I played on an intramural softball team with a bunch of my buddies. We had just finished a game and were cutting across the gym parking lot back to the dorm, when I noticed one of the guys standing over a sewer grate. He had a softball bat in his hand, and was moving it up and down through one of the drainage holes.

Now, this wasn’t just any bat. This was the lucky blue bat, the bat that everyone on the team used, the bat that never failed to deliver in the clutch, and the bat that helped propel our team into the campus semi-finals. It was “Thee Bat.”

“Jimmy, what are you doing?” I asked. Then suddenly, without saying a word he let go of the bat, and away it went, into the bowels of the campus sewage system. “What the hell’s wrong with you?” I snapped. “What did you do that for?”

“I don’t know!” he replied. “I wanted to see if it would fit.”

People don’t just do things; they do things for a reason. Now, that reason might not be particularly well thought through, or it could even be like Jimmy’s reason, and defy common sense, but there’s always a reason. There has to be a reason because people are intelligent, and intelligent things do things for a reason. That’s what intelligence is. That’s what intelligence does. Intelligence does things for a reason.

If we accept the premise that there is an intelligence behind the universe, then we have to accept the fact that it had a purpose or reason for creating it.

How can we say this? We can say it, because again, that’s what intelligence does. Intelligence does things for a reason.

If we choose to believe that God is the intelligence behind the Universe, then we have to accept the fact that God had a reason for creating the Universe. That’s pretty straight forward.
There has to be a reason

If we accept this premise, then the real question becomes; are we capable of figuring out what that reason is? In other words, are human beings capable of discerning the purpose and intent of the creator? Can we figure out why God created the universe?

Think about it. Is the intelligence that was created, capable of understanding the intent, of the intelligence that did the creating?

How do we go about trying to answer this question? I'm not too sure, but I think we can start by recognizing the fact, that we have the ability to ask. We can come to know and understand the purpose of the intelligence that created the universe because we are intelligent. And being intelligent, we can seek out and try to understand the intent of that intelligence.

Now, there’s always the possibility that we can misinterpret the intent, or that we’re not intelligent enough to fully comprehend it. And in all honesty, that’s probably where we are right now; but, the fact remains, that we are intelligent beings, and because we are intelligent, we should be able to discern some insight into the intent, or purpose of the creator.

So, how do we do that? How do we set out to understand the intent of the creator? Well, if you think about it, creation itself has to provide some clue. If there is a creator, some type of chief architect, then it designed creation to function a certain way. And, if it designed creation to function a certain way, then creation itself should give some indication of what that purpose is. Creation should be able to provide us some insight into the intent of the creator.

To figure that out, we need to do what we’ve always done; seek, question and explore. Study creation, look for the clues, and try to figure it out.

What then, does creation tell us?
There has to be a reason

Well, we know that the universe is designed to grow because it started off small, and then got really big. Now, when I say started off small, I mean really small. Seriously, everything in the universe, all the matter and energy, everything that there is, started off in a “singularity.” A point of zero volume and infinite density, that was smaller than a single atom. Then suddenly, it started to expand at a tremendous rate. And today, our universe is huge. It’s about 156 billion light years wide.

What else do we know about the universe?

We know that the universe is designed to evolve. The early universe was extremely chaotic, literally a quark soup of elementary particles and radiation. Then over time, like within a second of the Big Bang, things started to cool down and congeal; first came protons, and then electrons, then nuclei and finally atoms formed. About a billion years after that, the stars and galaxies started to form.

Today, our universe is not only immense, but it’s filled with all sorts of stuff. There are literally more stars in the cosmos, than there are grains of sand on the earth.

The universe is about 13.7 billion years old. Our earth started forming about 9 billion years after the Big Bang, and is about 4.5 billion years old. Human beings, we’re the new kids on the block; we’re only about 100,000 years old.

Our current universe is also fairly orderly. There are laws and universal constants that help keep it together and functioning.

Martin Rees is a Professor of Cosmology and Astrophysics at Cambridge University in England. In his book Just Six Numbers, he talks about the six precise numbers that impact our existence. They’re goofy numbers, numbers that I really don’t understand; numbers like N which is the measure of the strength of forces that holds atoms together divided by the force of gravity between them.
There has to be a reason

Like I said, I don’t understand any of the numbers. But, I do understand that if any of these numbers were off, even by the narrowest of margins, we wouldn’t be here.

It seems absurd, even comical, that just six seemingly random numbers could determine whether or not our universe evolved, and eventually, whether or not you and I ever existed. But that’s what I love about scientists. I look at $\lambda$ (lambda), another of Rees’ numbers, and think; “Wasn’t lambda the sorority with the really good looking girls?” Martin Rees looks at it and thinks: “Lambda is the force of cosmic antigravity, which controls the expansion of our universe. It doesn’t really affect things that are less than a billion-light years across, but if it wasn’t as small as it is, the stars and galaxies never would have formed.”

How amazing is that? These scientists are so intelligent. Sometimes I think that some of the best theology comes out of a laboratory, instead of a seminary.

Those six numbers are like the dials of a giant cosmic radio. If all six aren’t tuned to the exact right frequency you get nothing, just static. But once they’re aligned just right, you’re listening to the beautiful sounds of W-G-O-D, playing “all evolutionary music” all the time.

Clearly, if there is a chief architect of creation, and the universe is designed to function in a certain manner, it is designed to evolve.

So, the universe is designed to evolve. So what? What’s it supposed to evolve into?

Well, I guess that might just depend upon your point of view. If you choose to believe that there is no God, and that there is no intelligence behind creation, then it really doesn’t matter because there is no design. Creation is what it is, and what it’s going to be, and that’s it, end of story.
There has to be a reason

The universe might continue on forever, or it might collapse in a big crunch, or fizzle out in a big chill, but it really doesn’t matter. It’s all just academic.

On the other hand, if you choose to at least consider the possibility that there is an intelligence behind the universe, then you’re free to explore all sorts of possibilities.

If there is a God, and God is the intelligence behind creation, then God had to have a reason for creating the universe, and the design of the universe must reflect that reason.

We concluded that if there is a design to the universe, it was designed to evolve, but again, what’s it supposed to evolve into? Well obviously, it was designed to evolve into something that could produce and sustain intelligent life.

How can we say this?

Easy, we’re here and we’re intelligent, so if there is a design or intent to the universe, it is designed to produce intelligence life.

Who knows, maybe the entire universe was created just so intelligent life could evolve, and ask these really annoying questions? Maybe, the purpose of the universe is really a matter of the individual interpretation, of the intelligence that occupies it. You know, kind of like looking at a painting.

Think about looking at a painting, or any type of art, for that matter. I think it would be safe to say, that no one painting affects any two individuals, exactly the same way. It can’t. We’re all individuals, with our own set of unique experiences and thoughts. No matter how similar our reactions to any painting may or may not be, they’re not going to be identical. They can’t be. Maybe, that’s the point. Maybe, that’s the way we’re supposed to experience creation?
There has to be a reason

One of the neat things about art is that although it affects different people differently, we can still share it. You know, we can discuss it, talk about what we think, share our thoughts and ideas, and maybe even learn to see things from a different perspective. And when we share our experiences, we may even develop some new insight into the intent of the artist.

Maybe creation is like looking at a painting? Maybe creation is a matter of individual interpretation? I don’t know. It’s possible.

So, each of us can interpret God’s intent differently? We each get to decide?

Why not? You don’t have to be a trained art expert to be able to understand, or appreciate art. Obviously being an expert helps, but generally, most of us can kind of figure it out. It’s not like the artist is trying to hide something from us. What would be the point of doing that? Who’s to say creation doesn’t work the same way?

So, we’re all standing in an art gallery looking at a painting called Creation. And, we’re supposed to stand around and ask each other, “What do you think?” “Does it speak to you?” “Does it move you?” “What do you think the artist is trying to say to us?” Could be, why not?

One thing seems pretty obvious, the painting Creation was intended to be viewed by someone, with some intelligence. Whether we realize it or not, we’re the intelligence that’s standing in the art gallery, and asking ourselves these annoying questions.

So, maybe that’s the purpose of the artist; to create a work of art that can give rise to an intelligence that can admire and appreciate it?

Why would God do that? Why would God go through all the trouble to create the universe, and then wait for billions of years for an intelligence to evolve?
There has to be a reason

Well, I’m definitely speculating here, but maybe God, the intelligence behind the universe, created us, the intelligence that occupies the universe, so we could know each other. Maybe, even have a relationship with each other. Maybe, God experiences through creation. Maybe, our thoughts are God’s thoughts, our feelings are God’s feelings, and our experiences are God’s experiences. Maybe, we are part of God, and God is part of us, and together we experience creation.

Think about it. One of the traditional definitions of God says, that God is in all places at all times, and aware of all things.

Well, that would mean that God really can’t be separate and apart from creation. God must some how interact with creation. God must, to some extent anyway, be part of creation, or creation must be a part of God. And, if we are part of creation, God must be a part of us.

But there’s nothing new here, this also falls in line with the traditional view of God. As every child learns in Sunday school; God lives within us. Even the Lion King knows:

He lives in you
He lives in me
He watches over
Everything we see
Into the water
Into the truth
In your reflection
He lives in you

If God is the prime mover, that is the causeless cause; the first cause, the only thing that ever was, then all that there is, has to come from God. If there was a creation event, then it was at that point in time
There has to be a reason when everything emerged from nothing. It was the instant when the meta-physical became physical.

Now, the process of the meta-physical becoming physical must have required some expenditure of energy.

Think about it. Whether it was the Big Bang, the expansion of the singularity, or even some other event in some other dimension or parallel universe, if there was, in fact, a first cause, it must have required some expenditure of energy.

Now, in physics the law of the conservation of energy tells us, that in a closed system energy cannot be destroyed or created, it can only change form.

If our universe is a closed system, which it may or may not be, then everything in it, even the elementary particles that make up you and me, came into existence in some shape or form, at that first instant of creation.

Even if our universe is part of some mega-verse, just one cosmic membrane among many, the same holds true. As long as there was some creation event, then all that there is, must have come from that which caused the event, or that which preceded the event. Where else could it come from?

Of course, this assumes that our laws of physics, which were also created at that instant, were applicable.

So, if there is a creator, and if there was a creation event, then all of creations exist, not separate and apart from the creator, but because of the creator, and possibly as part of the creator.

What if the creation event was an act of self sacrifice? What if God held nothing back? What if in creating creation, God put himself entirely and completely into creation? What if God’s fate is tied to the
There has to be a reason
date of creation, and what if creation has been given the ability or free- 
will, to determine its own fate? In other words, what if God had faith
enough in us to sacrifice himself into creation, and is dependent upon us,
to have faith enough in him to make sure creation continues?

If God did go, “all in” and sacrificed himself into creation, I sure
hope he created some other intelligent life somewhere else in the
universe because given the track record of the human race; we’d all be in
big trouble!

So, God created the universe to know us, and to experience his
creation through us?

I don’t know, maybe. Why not? It’s as good a reason as any.

How could that be? We’re physical beings limited by the space
and time of the universe we live in. How could we possibly have a
relationship with a meta-physical being that is external to creation?

I guess that depends on whether or not God is excluded from our
space-time, and if we are limited to or confined to our space-time.

We have to be careful here. We don’t want to fall into the trap of
reductionism. Sometimes in science, as in life, we have to accept things
as true without any proof.

The most famous equation in all of physics, Newton’s F = ma
(Force = mass times acceleration) is a postulate. No one has ever been
able to prove it. It’s just something we’ve accepted, and assumed to be
ture for the past three hundred years.

We do this for a couple of reasons. First, we can’t prove it. I
mean, there’s no way to mathematically derive it, although remarkably
enough, that may have recently changed. Second, we need to accept it in
order to function, so we can move on and continue advancing the
science.
There has to be a reason

This is certainly the case with Newton’s equation. It’s the cornerstone of classical physics, upon which, an entire science is built; a science which helps form and shape our perception and understanding of reality.

We also do this with God. As we learn about God, we choose to accept some things and reject others, and let it form and shape our own perception of reality. We do this for the same reasons physicists accept Newton’s equation. First, we can’t prove that God exists. Second, we want to be able to get to the point where we can move on. Sometimes, you have to be willing to accept some things on faith, just to get started.

Now this isn’t necessarily a bad thing, but we have to be careful not to let it box us into a corner. We can’t assume that every postulate is automatically true, and that our perception and understanding of reality is totally accurate. We’re seeing this now in physics.

For centuries, we were certain that the universe function a certain way. We developed all sorts of models that accurately describe how things interacted and functioned, from the tiniest subatomic particles, to the largest of galaxies.

Today, physicists are talking about strings of vibrating energy, and seven additional dimensions of space-time. What would have been science fiction for Newton is today, just science.

What I’m trying to say, is that we don’t know everything, not yet anyway, so let’s not let our preconceptions, or our individual perception of reality get in the way of us exploring, or at least considering other possibilities.

What other possibilities? I don’t know; cosmic membranes, parallel universes, the nature of man, God? You name it.
There has to be a reason

The truths out there somewhere, and isn’t that what we’re really after, the truth; the truth about God, the truth about our own nature, the true reality. Isn’t that what science is trying to do? Isn’t that what we all should be trying to do?

If there is a God, God had to have a reason for creating us. If we are intelligent, we should be able to figure out what that reason is. If that reason is, so we can know God, and God can know us, then there has to be a way for us to know each other. There has to be a way for us to bridge the gap between the meta-physical and physical. There has to be something that is innate in our nature, something in our very being that enables us to reach out and seek the infinite, and know the divine.

If we are part of creation, and part of God’s design, then God’s purpose or intent isn’t hidden from us. God’s purpose is inside of all of us. We just need to learn how to find it.
MGM Studios at Walt Disney World has a great show that I absolutely love. It’s one of my favorites, that I never miss seeing whenever we visit Disney. It’s the “Indiana Jones Epic Stunt Spectacular.” It’s a live performance that re-creates many of the stunts from the movie “Indiana Jones and The Raiders of the Lost Arc.”

You’re seated in an amphitheater when the lights go down, and everything turns quiet. From out of nowhere, Indiana Jones repels onto the set. He dodges a booby trap of razor sharp spears, and then makes his way along the edge of a perilous cliff until he’s standing in front of the Golden Aztec Idol. He takes a bag from his pouch, and carefully removes just enough sand so it weighs the same as the idol. Then, with one swift movement, he snatches the idol from its pedestal and simultaneously replaces it with the bag of sand, being very careful not to set off any more booby traps. He has it! The golden idol is his! As he turns to make his escape, the ground begins to tremble. Suddenly, a gigantic stone boulder comes rolling towards Indy. He starts running for his life, and jumps to safety, just as he’s about to be crushed. The giant boulder continues rolling, off the set and out of view.

The director yells, “Cut!” Indiana reappears, and the set is suddenly swarming with stage-hands and technical crews. As the director begins explaining the scene to the audience, he’s interrupted when everyone starts laughing. Behind him, a single stage-hand is rolling the enormous stone boulder back into position.

It suddenly becomes obvious to everyone that the bolder wasn’t real. It’s a theatrical a prop used to create a special effect, an illusion. The director explains that the boulder is really made out of latex! It’s actually just a giant balloon. If the boulder were really made of stone, no single person could ever move it, let alone stop it from rolling off-stage. It would have demolished the restaurant next door, and probably
continued down Route 4 until it splashed into Tampa Bay, some 90 miles away. Once something that massive gets moving it has so much inertia, that it’s almost impossible to stop.

What’s inertia?

Well, inertia is a property that’s associated with the mass of an object. It’s an object's ability to resist moving when it’s standing still, and its ability to resist stopping when it’s already in motion.

Inertia has to do with Newton’s First Law of Motion: an object that’s at rest tends to stay at rest, and an object that’s moving tends to keep moving, unless it’s acted upon by some force. The more massive an object is, the harder it is to get moving, and once it is moving, the harder it is to stop.

Makes sense! The stage-hand was able to roll the huge boulder back into position because it didn’t have a lot of mass. Sure, it was big, maybe ten feet in diameter, but it was filled with only air.

Nevertheless, it looked real, and was a really cool special effect, but just the same, it was only an illusion. I guess that’s why they call it movie magic.

If you think about it, the entire movie is really just an illusion. Sure, there’s a lot that goes into making the movie, which I guess, is the whole point of the Stunt Spectacular; but when you get right down to it, the final product is only just a series of images printed on celluloid film. Not much really, but put that film in a dark theater, and pass it in front of a light source at about 24 frames per second, and what happens? Movie magic! A whole new world full of action and adventure, romance and comedy comes to life on the screen in front of you. Movie makers are so good at their craft, that it’s sometimes difficult to tell what’s real, and what’s just an illusion.
Our Universe, the physical reality that we live in, can be like that because sometimes it can be difficult to tell what’s real and what’s not. Now, when I say real, I mean something that’s made of matter, something that’s tangible and solid.

Think about Indiana Jones’ giant stone boulder. Although it appeared menacing, it was really a harmless light weight prop. Sure it was big, but it was harmless because it didn’t have enough mass to make it dangerous.

What’s mass?

Well, mass is the amount of stuff, the amount of physical matter that’s in an object. But mass is also energy. Seriously, it is! That’s what Einstein discovered with his famous $E = mc^2$ equation. Energy is equal to mass multiplied times the speed of light squared (the speed of light times itself).

So, if mass is the amount of matter contained in an object, then matter is really just energy, and apparently it is.

We used to think that the atom was the smallest particle of matter, but then physicists began breaking it down into smaller and smaller pieces called quarks and leptons.

Now they think that those particles are made-up of strings; vibrating strands of energy that aren’t really made of anything. These strings are just waves of energy, kind of like radio waves or sound waves.

The idea is that somehow, these strings come together to form physical matter. Scientists aren’t quite sure how this happens, but apparently, these little strings of nothing, make-up the stuff that makes-up you and me.
That’s the theory anyway. I certainly don’t get it, but some scientists think it might have something to do with what they call, the “Zero-Point Energy Field.”

What’s the Zero-Point Energy Field?

Well, the universe is full of all sorts of cosmic radiation and energy. Now, if you took all the energy out of the universe, the zero-point-energy field would be the energy that remained.

I guess there always has to be some minimum level of energy to function as the foundation of the universe, and that’s the zero-point-energy field.

See, quantum physics predicts that our universe is full of electromagnetic fluctuations. We and everything else in the universe are afloat in a sea of zero-point energy. It’s everywhere, inside us and around us, permeating everything in the Universe.

The zero-point energy field is light, or at least a form of light. The theory is that somehow this zero-point energy interacts with the strings of vibrating energy, and gives them form and substance. In other words, the light interacts with the mass-less stings of energy, and creates matter; the physical stuff that makes up you, me and everything else in the universe.

It’s a fascinating theory. A zero-point-energy field that’s everywhere, in all places at all times, effecting and interacting with all matter, giving it form, definition and mass.

Doesn’t this description sound familiar? Doesn’t it sound an awful lot like what God is supposed to be, or at least is supposed to do? Now, I’m not saying that this zero-point energy field is God, but doesn’t it sound like it?

Think about the traditional descriptions of God. Isn’t God supposed to be both omniscient and omnipresent? You know, all
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knowing, and in all places at all times. Isn’t God supposed to be the presence, the one thing that makes all other things real?

If this is indeed what God is, or what God does, then wouldn’t there have to be a way for God to interact with the physical universe?

Maybe, that’s what the zero-point-energy field is? Maybe, it’s the physical manifestation of God in our reality? Maybe, it’s God’s thoughts, or even God’s brain-waves?

Why couldn’t it be God’s brain-waves?

We know that brain-waves are real. Neuroscientists can measure them with an electroencephalograph (EEG). Brain-waves vary in both intensity and frequency. At the low-end, there are delta waves, which we generate when we are sleeping, or when we’re unconscious. I generate a lot of those. At the high-end, there are gamma waves, which we generate when we are thinking or reasoning.

In fact, we use brain-waves to determine whether or not someone is living or dead. We are legally dead, not when our heart stops beating, or our lungs stop breathing, but when our brain stops functioning. We are dead when we no longer have any brain-waves, when we’re “brain-dead”.

So, if God is alive, and God is the intelligence that created and sustains the universe; isn’t it possible that God could have something like brain-waves or thoughts?

Perhaps our universe, our physical reality, exists inside the mind of God, or inside God’s thoughts. And maybe, the zero-point energy field is the physical manifestation of those thoughts? Could be, why not?

Now, there are those whom I’m sure will find this notion absurd, perhaps even laughable, but why?
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If there is a God, if the traditional notion of God is correct, if God is indeed the presence that binds together creation, doesn’t it stand to reason that there must be some way for God to touch and shape creation?

If there is a God, how does God touch us? How does God affect and shape our reality? What bridges the gap between the meta-physical and physical?

Maybe science has taken us to a point where we can actually see God’s thoughts? Are we on the verge of discovering, or building something that may actually help us communicate with God? You know, just like in “Raiders of the Lost Ark,” a communicator for speaking to God?

That would be neat, but somehow I don’t think it works that way. Then again, if God is the sum of all possibilities, shouldn’t we at least be willing to consider all the possibilities?

A hundred years ago we thought we had a pretty good handle on reality. The atom was the basic building block of matter, and there were only three dimensions.

Today, scientists and philosophers are talking about the fabric of space-time, the possibility of eleven dimensions, and a zero-point energy field that shapes and forms our reality.

Is our perception of reality changing?

Maybe we’re beginning to realize that everything, in reality, is interdependent and connected; bound to everything else through this zero-point-energy field. Maybe it’s time to consider the possibility, that we and everything else in creation are part of and inseparable from, the rest of creation?
Maybe science is beginning to discover what theologians have been teaching for ages? Could the theological concept of “the one body” actually have a basis in modern science?

Science isn’t supposed to support traditional theological or religious ideas; it’s supposed to discredit them? At least that’s seems to be the role that science has played over the last couple of hundred years.

What’s happening here? Has science come full circle? Is scientific inquiry becoming a spiritual exercise? I don’t know, but I think it always has been.

When I read about these discoveries and theories, I’m instantly captivated by the thought that science might be closing in on the truth. It’s exciting to think that science might actually be able to confirm something that has always been a matter of faith.

What would happen if science could actually prove the existence of a universal intelligence, and find evidence of the force that makes all things real, and gives purpose and meaning to everything?

I know that it’s really just wishful thinking on my part because believing in God, even finding evidence of God, is, and always will be a choice.

Now, it’s possible that I find evidence of God, simply because I am preconditioned to find it. In other words, my upbringing, my education, my religious indoctrination, and my choice to believe, actually conditions me to find what I’m looking for. I find evidence of God because I want to find evidence of God.

I really can’t argue with that because it’s true. But then again, wouldn’t I be equally precondition not to find evidence of God, if I had already made up my mind not to believe?

So, what if I haven’t made up my mind, to believe, or not to believe? How do I decide? Am I even capable of figuring it out?
We all have limits. Well, you may not have limits, but I know that I do. And if we’re honest with ourselves, I think we’d all agree, that individually anyway, we have limits. We may not fully understand the extent of those limits, but as biological beings, we are certainly limited.

So, the question is: are there things that are simply beyond our ability to know? Is there a limit to what our intellect can comprehend, or is there a boundary, beyond which reason cannot take us? Are reason and intellect alone, capable of revealing the truth about God?

Reason and logic belong to the physical world, the world we can experience through our senses, and the world that we can touch, feel, hear and see. We exist in this physical world because our bodies and minds exist here. However, if God is meta-physical, that is, at least to some extent, beyond the boundaries of the physical world, then reason and intellect alone may never enable us to truly know God.

Earlier we said that God may have created us, so we could come to know him. Now we’re saying that God lies beyond our ability to know? That doesn’t make any sense. Why would God do that? Why would God create a being with intelligence, capable of thought and reason, and then shield himself from the very intelligence he created?

I don’t think God did! I think we can come to know the truth because there is a part of us that transcends the physical world, and enables us to know God.

Think about it! What is it that compels us to try to understand, that which seems to be beyond our ability to understand? Why are we driven to try to grasp the infinite? What is that annoying little voice inside of us that causes us to lie awake at night, asking ourselves questions that seem to have no answers? Why do we spend so much effort trying to define and find a meta-physical God? Wouldn’t we be better off saying “forget
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it,” and just put it out of our minds, and get on with the 70 or 80 years we have on this planet? Why can’t we do that?

We can’t say “forget it” because we are programmed, maybe even hard-wired, to seek the truth. We are specifically designed to seek out, and to know God.

There is a truth that is universal, part of almost every culture and religion on the planet. It is the acknowledgement of something that every human being intuitively knows. We are more than just biological organisms. We are more than just physical beings. There is a part of us that transcends this physical world. Call it consciousness, soul or spirit, I’m not sure what it is, but it’s who, and what we really are. It’s our true-self, our essence; it’s spiritual and it’s through this spiritual part of our nature, that we can come to know the truth.

We can come to know the meta-physical because there is a part of every human being that is meta-physical. We can come to know the divine because there is a part of every human being that is divine, and we can come to know God because God is a part of every human being. And, we will come to know God, only when we truly come to know ourselves.

Ok, how do we do that?

Well, I guess that depends on what you choose to believe, and how you let those beliefs shape your perception of reality.

If you subscribe to the reductionist belief, that we are nothing more than physical beings, then there’s really not much to know. We are simply the sum of the molecules and atoms that make up our physical bodies, and there is nothing more beyond that. Any notion of a consciousness, soul or spirit is an illusion, just the result of some chemical reaction that takes place inside the brain. We’re born, we live, we think, and we die. That’s it.
On the other hand, if you’re willing to consider the possibility that there is a spiritual dimension to human beings, your perception of reality changes, and you are no longer limited to the physical world of the senses. You open up a path to explore and know, that which lies beyond the boundaries of the intellect and reason alone.

It is the pursuit of knowledge, the exercise of the mind, and the act of seeking knowledge, that propels our intellectual evolution. Perhaps the same is true for our spiritual nature?

Maybe it’s the pursuit of the divine, the exercise of the spirit and the very act of seeking God that propels our spiritual evolution?

Clearly, we know we have a physical nature. Our mind and intellect are evidence of that. If we also have a meta-physical nature; a consciousness or soul, then we have a duel nature. We are both physical and spiritual beings and it is through both the mind and spirit, that we can come to know God.

So, what’s real and what’s just an illusion? Perhaps we’re all just sitting in a movie theater, and the physical world around us is the illusion, something that’s being projected on the screen of our space-time.

Maybe it’s the light source that’s real. Maybe, just like in the movies, it’s the light source that makes things real, and brings them to life. If this is the case, shouldn’t we be trying to find out whom or what is running the projector?

Speaking of the movies, I love that last scene from “Indiana Jones and the Last Crusade.”

Indiana, Harrison Ford, and his father, Sean Connery, are standing outside of the Grail Temple talking about their adventure, when Indiana asks, “What is it Dad? What did you find?” Sean Connery, tilts his head,
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looks him straight in the eye, and simply replies: “Me? Illumination!”

Doesn’t that just say it all?
On November 9, 1965 at the height of the evening rush hour, something struck the power-grid in the Northeastern United States. Thirty million people in Ontario Canada, New England, New York and New Jersey, were literally left in the dark without electricity.

Rumors quickly spread as to the cause of the blackout. UFOs had been sighted over the Clay Power Station in upstate New York, the suspected origin of the blackout. Up and down the East Coast people reported seeing objects glowing in the sky. Pulsating lights “flying in formation” were spotted over New York City. Even the New York Times and the NBC Evening News carried the stories. What was it? What caused the Great Blackout of 1965?

Well, it wasn’t a UFO; it was actually a two-dollar relay switch, installed on a transmission line coming from the Niagara Falls Power Station. The switch had been replaced a few days earlier, and was supposed to trip if the power exceeded the line’s carrying capacity. Unfortunately, for the tens of thousands of commuters stranded on subways and elevators that evening, the maintenance technician had set the relay, to trip at a much lower voltage. When it tripped, it started a chain reaction that plunged the Northeast into darkness.

The real cause of the Great Blackout of 1965 was far more terrestrial than extra-terrestrial. Even so, there are still plenty of people who insist that it was a UFO that caused the blackout. The faulty relay explanation they say is just part of a Government cover-up, to keep us all in the dark.

It’s amazing how people are so willing to ignore the facts, and opt for an explanation that’s so much more fantastic. But, I can understand that. It’s just more fun believing that UFOs caused the Great Blackout of 65. It stirs the imagination and begs the question, is there something else out there? Who knows, maybe we’re not alone?
On July 31, 2008 the National Aeronautics and Space Administration (NASA), announced something truly remarkable. NASA announced that there was water on Mars. The announcement was followed by a celebration at Mission Control that looked like the Boston Red Sox locker room, after they won the 2004 World Series. Scientists were literally popping open bottles of Champaign, and celebrating their discovery.

So, what’s the big deal? What’s worth celebrating?

Well consider this; the planet Mars is 36 million miles away from Earth. It takes a spacecraft almost 9–months, 260-days on average, just to get there. Earth started sending spacecraft to Mars as early as 1960. In all, we’ve sent 39 missions to Mars, 24 of which ended in failure; spacecraft have crashed into the planet, missed Mars entirely, or never even made it out of the Earth’s atmosphere. So, if you think about it, just getting to Mars really is a big deal.

In May of 2008, the Phoenix Mars Lander descended safely to the Martian soil, unfolded its solar panels, raised its antenna, and stretched out its robotic arm. It started to dig, and found something that looked like ice crystals. The Phoenix popped them into its on-board oven, turned up the heat, and sure enough, it melted. NASA had done it! NASA had confirmed the presence of water on Mars!

Still, what’s the big deal? We’ve long known that there's water in space. Comets are made-up of mostly water, well ice actually. They’re like giant cosmic snowballs. So again, what’s so special about a couple ice crystals on Mars?

What’s so special about water on Mars is that we now have an indication of just how rare extra-terrestrial life may, or may not, be.

See, life needs a special kind of environment in order to survive, and life, at least life as we know it, requires water.
Now we know that Mars has an environment that could potentially support life. That’s not saying there is life on Mars, or that there ever has been, but we now know that it’s possible.

Other than Earth, we’ve really only searched for life on one other planet, and that of course, is Mars. Although we haven’t found it, not yet anyway, we’ve found the conditions that could potentially sustain life.

When you begin to consider the rest of the universe; the billions of galaxies, the trillions upon trillions of solar systems, the probability that life exists elsewhere, starts to look pretty darn good. Now, that’s a discovery worth celebrating.

Of course, there's always the possibility that life exists on Mars, but we’d never find it because we really don’t know what we’re looking for. It could be so different than anything we’re familiar with here on Earth, that we wouldn’t recognize it, even if we found it.

That’s a real possibility because science doesn’t have a firm definition for life. They can describe life, but they really haven’t come up with a definition that nails it down. In fact, we’re still discovering new life forms on our own planet.

Seriously, we are. They’re called Archaea. Scientists used to think these life forms were just another type of bacteria, but then discovered that they’re actually their own life-form (domain). They identified them back in the 1970s. They’re singled-cell microorganisms; that live inside volcanic springs, at the bottom of the ocean, and even inside the human digestive track. So really, we’re still trying to come to terms with what’s living on this planet, never mind some other planet.

It makes you wonder: how did life originate on Earth anyway? Think about it, how did inanimate and lifeless matter suddenly become animate and alive? When did this happen? How did it happen?
I guess that’s the 64,000 dollar question isn’t it? The real mystery is: how did life originate on Earth?

Every culture and religion has some type of explanation for how life began. They’re called creation myths, or creation stories. And, it’s amazing how similar they are. Almost all of them share the common belief that life emerged from lifeless matter. In other words, the stars and planets came first, and then life came after them.

That kind of makes sense because, obviously life needs some place to live. So the idea that life arose out of lifeless matter, is almost common sense. Even the book of Genesis says that God created Man from dust, which is inanimate matter, and then breathed life in to him.

So, I guess the idea is almost intuitive. Interestingly enough, science has a similar theory. It’s called Abiogenesis. A-bio-genesis literally means life from non-life. It's the study of how life on Earth could have emerged from non-living, lifeless, or inanimate matter.

Abiogenesis is a relatively new scientific discipline, and doesn’t yet have a standard model. A standard model is, a single theory that everyone can agree on. There are actually several different theories that fall into the category of Abiogenesis. Most of them are pretty involved, and they all involve chemistry, which is definitely not one of my strengths, so there’s no point in getting into the details, because I wouldn’t be able to explain it anyway.

Nevertheless, the basic idea is that life emerged when the Earth was relatively young, and still forming.

About 3.7 billion years ago, the Earth was literally a molecular crock-pot full of bubbling pools of volcanic mud, churning up carbon, hydrogen and all sorts of chemicals. Over time, the conditions became just right for these chemicals to combine, and form amino acids.
more time passed, and the amino acids combined to form proteins and the proteins eventually evolved into living cells.

Now, there are a couple of issues with Abiogenesis. First, none of the theories can be tested in a lab. No one has ever created life from lifeless matter, nor has anyone, ever witnessed it happening. Second, all of the theories have gaps in them that can only be closed by either self-replicating molecules, or proto-cells. Unfortunately, self-replicating molecules and proto-cells are theoretical; they don’t exist, and may never have existed.

Some people might jump on this in an attempt to discredit Abiogenesis, in order to promote creationism, but that’s really not fair. Abiogenesis isn’t an attempt to prove, or disprove the existence of a creator. Abiogenesis is simply a hypothesis, of how life could have emerged on Earth. That’s what science does. That’s what science is supposed to do. It’s supposed to come up with hypotheses and theories on how things work, or could have worked. That’s how we learn. That’s how we gain a deeper insight into things, and hopefully, that’s how we grow.

The bottom-line, is that science doesn’t know how life on Earth emerged, nobody really knows.

So, absent of a working scientific theory, how then do we define life?

Well, some experts think that it’s impossible to develop a working definition of life because it’s really not a scientific question. It’s a philosophical question. The better question for science to answer they say, is what makes something alive?

Ok then, what makes something alive?
Well, we know life functions because all living things have some sort of metabolism. All living things take in food, convert it to energy, and use that energy to adapt, grow, and reproduce.

So, life functions, but it must go deeper than that. Life must also possess some type of intelligence, because it needs the knowledge, or a set of instructions, that tells it how to function; what to do, what to eat, how to metabolize, adapt, grow, and reproduce.

Ok then, life is intelligence that functions. I guess so, but there has to be something else, some other element. Life has to have something that enables it to execute its instructions.

Think about a programmable thermostat. You enter the program into its memory telling the thermostat when to turn off and on, and what temperature to set. That’s the instructions, or the intelligence. When it executes the instructions; when it turns off and on, and changes the temperature, then it’s functioning. But there has to be something else. There has to be a power source. In this case, it’s a battery or electricity, which enables the thermostat to execute its instructions.

Life must be similar. There must be some type of power source or energy that enables life to execute its instructions.

Science knows what the instructions are. They’re deoxyribonucleic acid, or DNA, you know, the twisted ladder thing. DNA is the genetic blueprint, or program that tells living organisms what to do, and how to function.

So, we know what the instructions are, and where they’re kept. And obviously, we know if something is alive, because we can see it functioning; metabolizing, adapting, growing, and reproducing. But, what is it that enables living things to execute its instructions? What’s the power source?
The Light Within

A dead organism still has its DNA instructions imprinted on its cellular material, but it’s dead, because it’s not functioning. Why?

There has to be something else; something that makes it alive. Living and dead organisms are both made up of matter. The same subatomic particles that make up living things make up non-living things.

So, what is it that differentiates living from non-living? What is it that makes something alive?

Is there a life-force, some type of energy that regulates, and controls a living organism turning it on, making it function, and making it alive?

Back in the 1920’s, Russian scientist Alexander Gurwitsch, discovered that living tissue emits photons or light. Nobody really paid much attention to Gurwitsch’s discovery, until 1976, when a German scientist named Fritz-Albert Popp figured out, how to use this photon emission to measure the healthiness of fruits, and vegetables.

Apparently, all living things emit light. Popp calls them bio-photons. Although we can’t see them with the naked eye, they can be measured with a photomultiplier.

Popp used a photomultiplier to measure the bio-photons being emitted by cancer patients, and discovered something astounding. Cancerous, or unhealthy cells, emit light faster than healthy cells. Dying cells literally bleed light. Shortly before a cell dies, it starts to rapidly increase its emission of bio-photons, and then, erupts like a supernova, releasing all of its light, and then it’s gone. It’s dead.

Living organisms are awash with bio-photons. They are constantly being emitted and absorbed by the DNA molecules, creating a bio-field, or communications network, that functions like the conductor of an orchestra, keeping the entire organism synchronized and in harmony.
If a cell loses its connection to the network, it gets out of synch with the rest of the organism, and dies. It happens all the time. The human body has about 10 million cells die each second. Fortunately, our bodies are so well-tuned, that new cells are created at just the right rate to replace the dying ones.

So, living things glow, they emit bio-photons. Why’s that so important?

Well, it’s important for a number of reasons. First, there are numerous practical applications. Scientists in Europe and Asia are already using Popp’s research in agriculture and industry. And, its potential impact on health, and medicine could be nothing short of revolutionary.

Imagine some day soon, doctor’s maybe using specially designed photo-multipliers to non-invasively diagnose, and maybe even treat cancer. Now, tell me that's not exciting! Second, Fritz-Albert Popp could potentially change biology in much the same way that his fellow countryman, Albert Einstein, changed physics.

Einstein’s work in physics changed the way we perceive reality, and the physical universe around us. Popp’s work could change the way we perceive life, by helping us redefine, the way living organisms communicate and function.

Modern biology is based on biochemistry. Biology of course is the study of life, or living organisms, and biochemistry is the study of living organisms, and the chemical processes that control them. Western medicine works on the premise, that if you can understand and control the biochemical processes that happen within an organism, you can affect the entire organism. It’s the whole idea behind drugs.
It’s a beautiful fall day, and you decide to go outside and rake some leaves. Later that evening you’re sitting on the couch, watching the game when your back starts throbbing. You’re not sure why.

Maybe you twisted it, or pulled something. Maybe you just over exerted yourself. Either way, it’s killing you. What do you do? You make your way to the medicine cabinet, swallow a couple of aspirins, and soon you start to feel better. Why? What happened?

Well, your back was hurting because it was swollen or inflamed. The aspirin you took is an anti-inflammatory that reduces the inflammation, and alleviates the pain. The process that occurs is chemical; the anti-inflammatory chemicals interact with and affect your body chemistry.

There it is, better living through chemistry! You have a headache, take a pill. You have high blood-pressure, take a pill. You can’t get in the mood, take a pill. It’s all chemical, all the cells within our body respond to chemicals because we’re all chemical, right? Well, maybe not.

The controversial work of the late French Immunologist, Dr. Jacques Benveniste, suggests that the process by which our cells communicate may not be chemical.

Benveniste’s theory is that our cells communicate, and respond by exchanging little packets of vibrating energy, like sound waves. It’s kind of like a game of pass it on. You know, one person whispers a message into the ear of the person sitting next to them, and they pass it on.

According to Benveniste, the vibrations, our cells use to communicate travel at the speed of light. Each molecule passes its specific message on to the next, and by the time it makes it to the end of the line, each cell knows what to do, and how to respond. It’s not
chemicals that stimulate a biological response, its sound waves or frequencies.

One of Dr. Benveniste’s more fascinating experiments involved all things, a guinea pig heart. Beneveniste’s research team took two different chemicals; one that increased the blood flow through the arteries, and the other that decreased it. They recorded the frequencies, or sounds being emitted by each of the chemical’s molecules. When they played these sounds to a live guinea pig heart, the heart responded as if the actual chemicals had been injected into it. The first recording made the heart speed up, and the second made it slow down.

Is that possible? I don’t know, but it sure is fascinating. I do know that Dr. Benveniste took a lot of heat for his work and was ostracized, even vilified by the scientific community; accused of being everything from a quack to a liar. But apparently, that’s not all that unusual. It’s similar to what happened to Doctors J. Robin Warren and Barry Marshall.

Doctors Warren and Marshall are the two Australian Scientists, who first proposed that stomach ulcers were caused by bacteria. The accepted teaching at the time was that ulcers were caused by excess stomach acid. Everyone knew that ulcers were brought on by stress, and a poor diet. Antacids and acid blockers were the standard prescription, and although marginally effective in treating the symptoms, they did little or nothing to actually cure ulcers.

The idea that ulcers were caused by bacteria was simply absurd. Everyone knew that stomach acid killed bacteria. There was no way that these two hicks from the outback, knew what they were talking about.

Warren and Marshall’s work was ignored and ridiculed for years. Unable to prove their theory on laboratory animals, Dr. Marshall decided to use himself as a human guinea pig. He swallowed a glass of the ulcer
causing bacteria, and sure enough, he developed an ulcer. Then he treated himself with some antibiotics and, sure enough, the ulcer went away.

In 2005, Doctors J. Robin Warren and Barry Marshall were awarded the Nobel Prize in Medicine for “their discovery of the bacterium Helicobacter pylori, and its role in gastritis and peptic ulcer disease.”

So, is Dr. Benveniste’s theory correct? Do cells use frequencies to communicate?

It sounds plausible to me, but that’s only because I have no idea how this stuff really works. I took biology in high school, but that was so long ago they hadn’t even invented the test tube yet. I’ve helped my daughter Emily with her eighth grade homework on cells but honestly, I don’t have a clue. I’m not a biologist or a scientist, but I do find Dr. Benveniste’s theories fascinating because I can appreciate their potential impact on health and medicine.

Imagine that instead of going to a drug store to pick up your high-blood pressure medication, you log-on to the internet, and download it to your I-Pod from Med-Tunes.com. How cool would that be? When you begin to think about the potential implications, and applications you begin to appreciate just how revolutionary Dr. Benveniste’s theories could be.

Now, the conspiracy theorists among us might see the dark hand of corporate greed, and corruption at work trying to discredit Dr. Benveniste, and suppress his discovery, but I honestly don’t think it works that way. It may take decades before we find out if his theories are correct, not because they threaten a multi-billion dollar pharmaceutical industry, but because that’s the way it works.
All of western medicine is based on the theories that govern biochemistry, and a lot of extremely intelligent people have dedicated their entire lives to studying them. For these people, it’s not a question of not knowing, or not understanding how it works, they are absolutely convinced that these theories are correct. They have to be. It’s what they’ve been taught, and it’s what they know. They’ve made so much progress and made so many discoveries using these theories, that they simply can’t be wrong. Any attempt to prove otherwise is going to be regarded as heresy. And that’s the problem that Dr. Benveniste faces. It’s the same problem that Doctor’s Warren and Marshall faced. It’s not a conspiracy, it’s simply human nature.

Think about it. Our perception of reality, how we view the world, and how we think it works is often based upon beliefs, as opposed to facts.

There was a time when we were absolutely certain that the earth was the center of the universe, and that the sun revolved around us. Why?

Well, that’s what we observed. The sun came up in the East and set in the West. We were stationary with our feet firmly planted on the ground, and it was the sun as anyone could see, that moved around us. Then along came Copernicus and suddenly it’s the other way around.

What happened? Were the people back then just naïve or were they simply too arrogant to see the truth?

Like most people, they were probably a little of both. More importantly, they were functioning with a belief system that was based upon a very limited perspective of reality. It was Galileo’s telescope, a technological innovation that literally provided them a new perspective into the workings of the cosmos, and a better understanding of reality.
The Light Within

Very often it’s our beliefs that shape our perception of reality. When we seek, we acquire knowledge and in turn, begin to discover truths that can alter our beliefs, and change our perception of reality.

The real lesson here is that we have to be careful not to let our beliefs get in the way of our discoveries. If we’re arrogant enough to believe that we already know it all, then we’ll never really know anything.

So, getting back to the original question; what is it that makes something alive? Are bio-photons the actual life-force that makes things living, or just the visual evidence of some other life-force? If the zero-point-energy field is the force in the universe that gives matter its substance, could it also have something to do with making matter alive? Are bio-photons the physical evidence of this life-force? Is it the constant interaction and communication between matter and some life-force that defines and sustains life? Maybe we need to be plugged into some universal intelligence to be alive, to experience and function, to exchange information and communicate? Are bio-photons the physical evidence of this intelligence?

Do things need to be intelligent to be alive? Do they have to be aware, or conscious? I’m not saying that all living things need to be self-aware, but maybe they at least need to know that they’re alive. Is knowing that you’re alive the same as being aware, and is it awareness that explains why living things function, and respond the way they do?

Perhaps awareness is nothing more than communicating, or transmitting and receiving the information that provides the guidance, direction, energy, and ability for something to actually function and live. Maybe living matter is different from non-living matter because it’s able to communicate with some external intelligence? In other words, living things are alive because they are plugged in to God?
The Light Within

Of course, I’m only just speculating. No one really understands what it is that makes something alive. Just as no one really knows how life on earth originated. In the end, in the absence of proof, they’re all just theories. And, one theory’s as good as the next I suppose.

Some scientists have even proposed that life could have originated elsewhere in the universe, and been deposited on earth by a comet, meteor, or even space dust, which, I guess is possible. Or maybe it’s those pesky extra-terrestrials again messing around with our planet. But seriously, although we haven’t found any definitive answers yet, the good news is that we continue to look, and that’s what’s most important.

What strikes me as remarkable is that no matter where we look, we seem to keep coming back to the same place. We have particle accelerators that can peer into the quantum world of the atom. We have telescopes that can see to the edge of the universe, and the beginning of time. We have photo-multipliers that might be looking at the very communications of life, and they all seem to be telling us something similar. Telling us that there’s something more, something we haven’t been able to quantify, something science just can’t seem to pin down. They all seem to be telling us that there’s something that goes deeper than what we can currently see, or understand, something that’s part of the very fabric of reality, and binds and holds reality together.

Is it a universal intelligence? Is it some cosmic life-force, or is it what we’ve traditionally called God? I don’t know. What’s the difference? I know what I believe it is, but I really don’t know.

What I do know, what’s most apparent and obvious to me, is that we’re supposed to try and find out. Isn’t that why we build particle accelerators, telescopes, and photo-multipliers, to try and find out? We search, seek, explore, and question because we’re trying to find out the
truth about our reality. Isn’t that what human beings seem to be designed to do?

I’m not a scientist, and I’m not a biologist. I don’t know how life on Earth originated, or what makes something alive. I’d like to know, but I don’t. But maybe that’s a good thing. Maybe not knowing makes me more willing to at least consider the range of possibilities. And, maybe that’s what I’m supposed to do. You know, consider all of the possibilities. That’s seeking isn’t it? Maybe that’s how I grow. Maybe, that’s how I evolve. Maybe that’s how Man is supposed to evolve.

There is an interesting footnote to the Great Blackout of 1965. The blackout occurred on a Tuesday evening at about 5:15 PM. It was the height of the evening rush hour, and because of Day Light Savings Time, it was already dark outside. Subways came to a screeching halt inside underground tunnels. Elevators trapped passengers between floors. Even though thousands of commuters were literally plunged into total and complete darkness, the people of New York City never lost their composure.

There were no riots, no looting, and no panic in the streets. Like true New Yorkers, they took it all in stride. Strangers banded together to rescue people trapped in elevators. Boy Scout Troops made their way into subway tunnels with flashlights and lanterns to help guide the riders to safety. The New York City Police reported only 65 arrests that evening, significantly less than an average night. It was truly a proud night for the people of the Big Apple.

In 1977 New York City suffered another massive blackout, but this time the people were significantly less composed. Looters and rioters broke into stores wiping out local businesses, setting fire to buildings, and causing more than $300 million in damage. That evening the New
York City Police arrested 3,766 people. Time Magazine called it “A Night of Terror.”

What happened to us between 1965 and 1977? That’s just a little more than a decade. What changed? Are we moving in the right direction? If we are evolving, what are we evolving into? What’s going to happen during the black-out of 2012?
Scientists may not be quite sure how or when life emerged on earth, but they think they have a pretty good idea of when humans emerged. Let me check that! We have to clarify what we mean by human because there have been at least five different species of humans that have inhabited the earth.

Modern humans, that’s you and me, we’re Homo Sapiens. Our species first appeared on earth about 100,000 years ago, and apparently, every single person alive on the planet today is related. Seriously, we are!

Professor Joseph Chang, from the Department of Statistics at Yale University, has calculated that we all share a common ancestor, who may have lived as recently as 3,000 years ago. They call it the most recent common ancestor (MRCA).

Now, Professor Chang isn’t too sure if our most recent common ancestor was a male or female, but it definitely appears, that there was either an Adam or an Eve, to whom we’re all related.

It’s fascinating, but that’s just us Homo sapiens, there have been other species of humans.

Have you seen those cavemen in the GEICO TV commercials? Well, they’re Neanderthals or Homo Neanderthalensis, and although we share a common ancestor, they were a different species of human. In other words, we didn’t evolve from Neanderthals. They may have been on the earth at the same time as Homo Sapiens, but for some reason they didn’t make it. They died out about 30,000 years ago, and became extinct. I guess that’s what happens when you pay too much for your car insurance. Anyway, there have been other species of humans.

The latest candidate for inclusion into Club Human is Homo Floresiensis. They were the Hobbit people of Indonesia, who survived, until about 10,000 BC, before they became extinct.
So, when we use the term human being, we have to be specific about what we’re talking about.

If we’re talking about humans, as in the genus Homo, Homo meaning human or man, we have to go back two million years to Homo Habilis. Fossils tell us that these early humans had fairly large brains, which were about half the size of ours. Still, we have to be careful talking about the genus Homo because it has a “missing link.” You know, Darwin’s famous missing link. So we should probably start with Lucy.

In November 1974, Professor Don Johanson was on an expedition in Hadar, Ethiopia, looking for fossils of early hominids. Hominids were some of the first ape-like creatures that walked erect. Apparently, walking erect was literally the first step towards becoming human. Hominid’s had a foot much like that of modern humans. Their big toe lined up with the rest of its toes, helping it to balance and walk upright.

Anyway, Dr. Johanson and his team found the skeleton of a female hominid which they named Lucy. Lucy was a new species of hominid, 3.2 million years old and the common ancestor of all human species. Lucy was the first ape to stand up and walk erect. She was the ape that ushered in “The Dawn of Man.”

Stanly Kubrick’s 1968 movie, 2001: A Space Odyssey has an interesting depiction of “The Dawn of Man.” It starts with a group of prehistoric humans, ape-men, much like Lucy must have looked, sulking in a cave. They had just been chased away from their watering hole by a larger more aggressive group of ape-men. The sulking ape-men awake the next morning to find a large black monolith outside their cave. It looks like a twelve foot domino, but without the white dots. Anyway, the monolith starts humming. At first the ape-men go crazy, but then slowly approach the monolith, start touching it, even caressing it.
The Dawn of Consciousness

Somehow, the monolith imparts intelligence into these early humans because in the next scene, one of the ape-men, figures out how to use a zebra leg bone as a club.

Naturally, the first thing they do with this new-found knowledge is to go back to the watering hole, and kill the other ape-men that had chased them away. It’s not a very pleasant depiction, but it’s probably pretty accurate.

If you think about it, historically, the human race has spent a considerable amount of its brain power and resources, trying to build a bigger and better club.

The Stockholm International Peace Institute estimates that the world spent 1.3 trillion dollars, on military expenditures in 2007. The United States alone, has committed on average, 5.5% of its gross domestic product to defense spending, every year for the past 50-years.

I’ve often wondered what the world spent on war, during the 20th century. Not just the cost of weapons and armaments, but the cost of conflict, the cost in terms of lives lost, people displaced, property and dwellings destroyed, resources and economies ruined. It must be astronomical.

Now, you’re probably thinking, “That’s absurd, you can’t put a monetary value on a human life!” and I agree, but apparently, we’re wrong.

The United States Department of Transportation has determined that a human life is worth exactly 5.8 million dollars. Seriously, they call it the Value of Statistical Life (VSL).

Executive Order 12866, dated September 30, 1993, directs all Federal Agencies to do a cost benefit analysis of any proposed regulations, to insure that it is not too expensive for the American Taxpayer. It’s a reasonable enough directive.
So, let’s imagine the Department of Transportation found a defect in a specific type of commercial airplane. They’d have to do a cost benefit analysis to determine, whether or not, they should require the airlines to fix it.

If the fix was going to cost the air lines a billion dollars, but the chances that the defect would cause a crash, was only one in a hundred million flights, they probably wouldn’t order the fix.

Because there are about 28,000 commercial flights a day in the US, you could reasonably expect one crash every 10 years. One crash killing a hundred people would be 100 times 5.8 million, or $580 million, and since $580 million is less than a billion, they wouldn’t order the fix.

On the other hand, if the chances that the defect would cause a crash were two in a hundred million flights, they probably would order the fix, because 200 times 5.8 million is 1.6 billion dollars, and that’s more than the cost of the fix.

It may sound callous, but how else would you do the analysis? Of course, we’re just playing with statistics, and statistics really don’t mean that much. That is of course, unless you happen to be one of them.

Anyway, getting back to calculating the cost of conflict; the estimates of human deaths from war during the 20th Century range anywhere from 160 million to 200 million people. If we took the mid range estimate of 180 million people, and used the Department of Transportation’s VSL of 5.8 million dollars, the cost of human life lost due to war during the 20th Century, is 1.044 quadrillion dollars.

How much is a quadrillion dollars? A quadrillion dollars is one thousand trillion dollars.

Now, I’m not trying to be a smart aleck, and I’m not trying to pretend that I’m some holier-than-thou peace-nick. I’m just making an
observation that unfortunately tends to support Stanley Kubrick’s premise.

Anyway, I’m not too sure if we really do know when the first humans emerged on earth.

Does walking erect make you human? Does using a rock to crack open a walnut make you human? Does painting a picture on the wall of a cave make you human? I don’t know, maybe it does.

Neanderthals lived in communities; made tools, hunted, wore clothes, and they may even have spoken, but they didn’t draw on caves.

What’s so special about cave drawings anyway?

Well, anthropologists say that cave drawings are a form of personal expression that indicates the ability to understand abstract concepts. The emergence of cave drawings marks a turning point in human evolution; a profound change in the way early man viewed himself, and the world around him. In Dr. Johanson’s words, cave drawings represent “The Dawn of Consciousness.”

So, is it being conscious that makes us human? I don’t know. I’m not too sure what consciousness is. Is it being aware or awake, or is it being “self-aware”, whatever that means?

Our cat Petee is aware. He recognizes the members of our family and remembers things. He remembers that I’m the first one up in the morning, and he comes into my bedroom every day at 6:30AM, and starts pawing me in the head because he knows, that I’m going to get up and feed him.

Unfortunately, Petee hasn’t learned the days of the week yet, which is why he finds himself getting booted off the bed on weekends.

Certainly, Petee is not human, but is he conscious? What does it mean to be conscious? Where does consciousness come from?
The Dawn of Consciousness

The conventional theory is that consciousness is an emergent property of the brain. The brain is like a computer, and the neurons or brain cells, act like the computer’s transistors. They’re constantly firing, transmitting information, and making billions and billions of calculations every second. At some number of calculations per second, consciousness simply emerges.

I guess this makes sense, although there are those who take issue with this theory. Some neuroscientists think that human information processing doesn’t actually occur at the neuron level. They think it might occur at a much smaller level, within the microtubules of the cells. Microtubules are the little filaments that make up the shell of the neuron.

Even if this were the case, the computer model could still work. The speed or threshold, needed for consciousness to emerge would just have to be much faster.

It’s estimated, that the human brain can process 10 quadrillion calculations every second. Right now, the fastest super computer in the world can only handle about 360 trillion calculations per second. So, computers would have to be 300 times faster than they currently are, to approach the calculation threshold of the human brain. But, that’s not unimaginable. Computing technology improves every day, and we’ll probably have a computer that can calculate as fast as the human brain within the next ten years.

Does this mean computers are going to become conscious, like the computer HAL in 2001: A Space Odyssey?

I don’t know. One of the problems with trying to equate consciousness to the number of calculations per second that the brain can handle is that, it assumes that the human brain is algorithmic. In other words, the brain is controlled by some type of mathematical formula, or program.
Think about it. The only reason a computer works is because someone has written a program; a set of instructions telling the computer what to do and when to do it.

Now, the program could be incredibly complex; so complex, in fact, that it gives the computer the ability to alter or change the instructions, even write new instructions. However, no matter how complex it gets, the instructions have to be logical, and based on some set of rules that can’t be violated.

If the human brain does indeed work in this fashion, the only way we can ever come to know anything is through some sort of calculation, or algorithm. And, if the brain is nothing more than an organic computer that gives rise to consciousness, then we are surely subject to the rules of determinism.

What’s determinism?

Basically, it’s the idea that every event is determined by the events that came before it. It’s pretty much the classical Newtonian approach to understanding reality.

Imagine that the universe started off like a giant pool table, with all the balls racked and stacked in the middle of the table. Then something fired the cue ball at the stack, scattering all the balls. If you knew the exact angle, and the force at which the cue ball struck the stack, you could calculate with absolute certainty, the exact position of every ball on the table.

In determinism, everything is calculable, and everything is knowable. The universe or our reality, functions like a gigantic cosmic clock, that’s been wound up and left to unwind. It’s predictable and certain.

Certainty is good! Most people like certainty and predictability. That’s why we settle into patterns. That’s why we have our favorite
restaurants and TV shows. It’s why we hang around with the people we do. We like knowing what to expect. It gives us a sense of control over our lives. If we know where all the springs and gears of the clock are, we can tell what’s going to happen, and maybe even prevent something bad from happening. And that’s good, isn’t it?

What if the Newtonian approach is right and the universe is just some giant cosmic clock? Who cares? What does it mean?

Well, for starters, it means that we’re all just another gear in the clock. That’s it, nothing more nothing less. We can only do or act in a way that the clock lets us act. Biologically, we’re programmed by our genetic code, and we will live and die according to that code. We are nothing more than a “helpless spectator” of our own existence. Any sense of free-will that we experience is just an illusion. Our fate was determined before we were even born.

This kind of reasoning seems kind of harsh doesn’t it?

But, if the deterministic approach is correct, and that’s the way reality really works, then that’s what we are. We are nothing more than organic computers executing our programs. That is of course, if that’s how reality really works, and how human consciousness really emerges.

There are other theories on consciousness that don’t subject us to the rules of determinism. Some of the more interesting models come from the bizarre and annoying world of quantum theory.

Now, that’s unfair. I only say that quantum theory is bizarre and annoying because I don’t understand it. But then again, as Nobel Prize winning physicist Richard Feynman said, “Nobody understands quantum theory.”

To be fair, quantum theory has been incredibly successful because it gives us the most accurate depiction of reality at the most fundamental level of matter. It’s brilliant because the math works with indisputable
accuracy. It’s annoying because some of its implications simply defy common sense.

The universe that quantum physics describes couldn’t be more different than the certainty governing Newton’s cosmic clock. The reality of quantum physics resembles Lewis Carroll’s hallucinogenic world of Alice in Wonderland.

Time flows in both directions at once, things pop in and out of existence, suddenly change form, and inexplicably affect other things, at the opposite end of the universe.

It’s absurd to think that reality could work this way. It can’t. But you know quantum mechanics has been around since about the turn of the 20th Century, and after more than a hundred years of experimenting and testing, it might be time to consider the possibility that reality really does work like this.

British mathematician Roger Penrose doesn’t subscribe to the computer model of consciousness. He believes that there are other “non-algorithmic” ways, by which we can come to know things. He thinks that there are things within the physics that control reality that are non-computational, and that we can come to know these things through a process that doesn’t involve calculations, or algorithms.

I’m not too sure what he’s talking about. It might be something along the lines of reason, in-sight, intuition, or maybe even revelation, I don’t know.

Anyway, Sir Roger Penrose and Doctor Stuart Hameroff have been working on a theory which uses quantum physics to explain human consciousness.

The basic idea is that truths, be they mathematical or moral, are fundamental features of the space-time geometry that makes up our reality. They’re like the threads that make up a piece of fabric. These
truths are imprinted, encoded on the consciousness of the universe, a proto-consciousness with which we are entangled, and access through our own conscious experience.

What the heck is that supposed to mean?

I’m not too sure, but it has to do with what Italian astrophysicist Paola Zizzi calls “The Big Wow.”

She suggests, that very early in the creation of the universe, there came a moment when the universe had a conscious experience, and became conscious, hence “The Big Wow.” At that moment, all knowledge, information, and truth was imprinted, or encoded into the fabric of the universe. She theorizes that the human mind and the universe share the same organization, access the same quantum information, and undergo similar conscious experiences. In other words, human consciousness has its origins in the birth of the universe. Our consciousness is part of the larger proto-consciousness of the universe. Now, that is a Big Wow!

Penrose and Hameroff suggest that, if the human mind functions like a computer, then it functions like a quantum computer.

So, what’s a quantum computer and how does it differ from a regular computer?

Well, a regular computer is pretty simple. It breaks everything down to either a yes or a no answer, following a logic flow until it finds a solution. For example, if the light is green then go, if it’s not green then stop.

Although, in the real world, most questions aren’t this simple. Most questions take a little more time and effort to answer. Some questions are so complex that they could have an unlimited number of possible answers, which theoretically might even be beyond computing.
The Dawn of Consciousness

It’s kind of like a teenage girl deciding what to wear on a date. It would take a regular computer an incredibly long time to evaluate all the possibilities and arrive at a solution. Even when it came up with one, she probably wouldn’t like it. The computer would get stuck in an endless loop considering one alternative after the next, forever.

A quantum computer uses the principals of quantum mechanics, to simultaneously consider all the possibilities, and then, almost instantaneously, settles in upon the right answer. And it’s the right answer by virtue of the fact that it’s the answer that it came up with. In other words, the computer created the answer so, whatever answer it came up with, has to be the right one.

Penrose and Hameroff propose that a similar process happens inside the microtubules of our brain cells. There are literally billions upon billions of these tiny quantum computers working together to create the human mind.

At this quantum level, reality splits into two pieces. There are actually multiple realities, or parallel universes created by our mind. They build up very rapidly, become subject to the pull of quantum gravity, and then collapse into a single reality. This is the reality that we experience, the reality that we choose, and the reality that we create.

It’s this continual process of collapsing reality that philosophers call “occasions of experience.” Penrose and Hameroff believe that it’s this non-computable quantum process that gives rise to human consciousness.

Wow, that’s really amazing, but I doubt there’s a person on the planet that really understands what it actually means. And certainly I don’t, but what I do find fascinating is that we have these two versions of reality that are so opposite. They even seem to contradict each other.
The Dawn of Consciousness

The Newtonian approach feels right; it’s logical, predictable, and intuitively it makes a lot of sense. However, if it’s true, it condemns us to a reality in which we are nothing more than organic automatons. There is no such thing as free-will, and any sense of self we think we experience is just an illusion.

On the other hand, the quantum approach is completely illogical, totally uncertain, and counterintuitive. But if the quantum approach is correct, not only do we have free-will, but we may just be the co-producers of our own reality. How weird is that?

I don’t know which I find more disturbing: the idea that I just don’t matter, or the possibility that I create my own reality. If I had to choose, I think I’d join Alice in Quantum-land, but I’m not really sure what that would mean.

How could the universe be this weird? What does it mean to live in a quantum reality?

Well, I guess if we describe Newton’s Universe as an inanimate clock, we could describe the Quantum Universe as a living organism, kind of like the human body.

Think about it. The human body contains between 50 and 80 trillion cells, with each individual cell, mirroring the functions of the entire body. That is, each individual cell has its own metabolism, reproductive system, and communications network. We are literally a community of cells. Each cell does its own thing, but within the orchestration of the body.

If I cut my finger what happens?

First, the blood vessels tighten, reducing the blood flow to the injured area. Then, enzymes signal platelets to plug the torn blood vessels. Next, clotting proteins join in to help stop the bleeding. Once the bleeding stops, the constricted blood vessels dilate, so white blood
cells can rush in to destroy any hostile invaders. Then, my body starts to heal itself. Cells produce collagen, to fill the wound and create new capillaries, which brings oxygen-rich blood to my wounded finger. And finally, new skin begins to form and closes my cut.

It’s an amazing process that involves and affects the entire body. If something happens to a single cell in my body, the rest of my body is instantaneously aware of it, and knows how to respond. Somehow, the cells of the human body are entangled with each other. Nothing happens to one, without the entire body knowing about it, and being affected by it.

Is it possible, that in a quantum reality, we are entangled with the proto-consciousness of the universe? Perhaps the proto-consciousness is instantaneously aware of, and affected by anything, that happens to any individual consciousness. Maybe consciousness is like the cells of the human body. Nothing happens to one, without the whole knowing about it, and being affected by it.

But there’s nothing new here. This idea has been around for thousands of years. It’s the Atman, the Buddha-nature, or even the Mystical Body. It’s the basic idea, that although we exist as individual conscious entities, in reality, we exist as part of a larger universal consciousness. We are entangled with some kind of proto-consciousness, some type of Universal Mind.

I once read an account of the enlightenment of the Buddha, in which it was said that at the moment of his awakening, the Buddha experienced his 35,000 previous life-times.

Why 35,000? Why not 34,999, or 35,001?

I don’t know why, but I don’t think that 35,000 is a number that we’re supposed to take literally. I think it’s more figurative. Kind of like; how many times do I have to forgive someone? Not seven times,
but seventy times seven times. It means a lot, perhaps an infinite number.

So, at the moment the Buddha awoke, he became conscious of some huge number of previous life-times. Were these lives that he actually lived, or did he become aware of the experiences of the universal consciousness? Who knows?

What if everything that we experience is also experienced by the proto-consciousness? That is our thoughts, feelings, emotions, and experiences become the proto-consciousness’ thoughts, feeling, emotions, and experiences. Is this what quantum entanglement means?

Maybe, those lives that the Buddha experienced weren’t necessarily his own past lives, but the lives of other conscious entities, that are quantumly entangled with the universal consciousness. Maybe that’s what it means to awaken, or become enlightened, or to be truly conscious. Maybe, that’s what we experience after we die. Maybe we experience all the thoughts, feelings, emotions, and experiences of every other conscious being that ever existed.

Now, that’s a frightening thought. How terrifying is that?

Think about it! Think about all the pain and suffering the human race has inflicted on itself; the 180 million dead due to war during the twentieth-century, the 12 million who perished in the holocaust, the countless numbers of people who have been exploited, oppressed, and abused over the centuries. Holy Moly!

Then again, think of all the love, kindness, and compassion that human beings are capable of. What about the collective warmth and tenderness that people have shared with each other? Maybe, we get to experience that too.

Maybe reality is a zero-sum game. Maybe, in the end, the good and the evil will cancel each other out, and whatever has the most built
up wins. Maybe, that’s going to be the heaven or hell, that we collectively create for ourselves.

I wonder what they’ll be more of, good or evil? Does it work like this for us individually, or are our fates quantumly entangled?

You know there’s something here that really doesn’t add up. If most of the major religions of the world have this idea of “oneness”, this universal consciousness, then why is there so much suffering in the world? Most people belong to a religion, and most people say they believe in God. Yes, we’re talking about God again. Let’s be honest here. Isn’t that what we’re really talking about? The Mystical Body, the Universal Mind, the proto-consciousness, call it what you will, but aren’t they really just another way of describing the creator?

If so many people subscribe to the belief in God, then why is there so much evil in the world? Is it just a few bad people messing things up for the rest of us, or is there something inherently flawed in human nature?

I’m not sure. But again, look at our history. There’s an awful lot of badness there. That can’t be the result of just a few rotten apples. There’s got to be a whole lot of people saying they believe in one thing, and then doing another. There is definitely some type of disconnect going on here.

I think the disconnect emerges at least partially, because most people say they believe in something, but they really haven’t given it much thought. Seriously, we don’t.

We go to church and we go to school, we listen to what they tell us and say, ok. We let other people do our thinking for us. They call it dogma, or doctrine. There’s religious doctrine, scientific doctrine, political, and economic doctrine. It’s what indoctrinates us. It’s what shapes our belief systems.
The problem is, that most of the time, our beliefs aren’t based on our own thoughts. They’re usually based on someone else’s. And because they’re not really our own, they’re not really that important to us. Subsequently, it’s very easy to find ourselves saying one thing, and then doing another.

It’s like trying to help my daughter Emily learn 8th grade algebra. I’ve shown her how to solve the problems. I’ve explained all about eliminating the parentheses, combining like terms, and isolating the variable, and she patiently sat there and took it all in. But the way she really learned algebra was by sitting down, and solving the problems, on her own.

The more she worked at it, the more problems she solved, the better she got. That’s how she developed a good working knowledge of algebra.

I use the term “working knowledge” because that’s what she has. That’s what I have. I know how to follow the steps and find the answer, but I really don’t have a good grasp of the abstract concepts behind algebra.

Nevertheless, I can use it. I used it the other day to figure out the distance between third base and first. It’s 127 feet 3 inches, and it’s a throw my twelve year old son can make better than me. How sad is that?

Working on solving algebra problems gave me a good working knowledge, that I can use to figure out stuff. Maybe, it works that same way with God. Maybe, it’s the process of asking ourselves the questions, and struggling to find the answers, which provides us the good “working knowledge” that we need to figure out stuff; improve our lives, and maybe, even make us better people, or better conscious entities.

Maybe we don’t have to be enlightened. Maybe, like in algebra, we really don’t have to understand the abstract concepts behind God, to
benefit from God. Maybe it’s the process of seeking that gives us a foundation, upon which we can build our beliefs. Maybe we have to stop listening to others, and start trying to figure these things out for ourselves. Maybe then our beliefs might actually mean something to us, and we’ll stop saying one thing and doing another.

Ok, I have to be honest. I really don’t know when the first humans emerged on earth. I like to think, that the first human being was the first person or ape-man, who looked into the evening sky and asked: “Where did all this come from? How did all this get here? How did I get here? Why am I here?”

I have no idea when this happened, or what those early humans may have looked like, but that’s when I believe the first humans emerged. Maybe “The Dawn of Man” and “The Dawn of Consciousness” are really the same thing.

Think about it. Isn’t it our ability to ponder the past, and speculate about the future, that sets us apart from the other living creatures? Isn’t it our desire to understand the world around us, and our need to figure out our place in it, that makes us unique? Isn’t it the sense of self that arises from our experiences, that makes us conscious? Isn’t it the effort we put in trying to find the answers to these questions that, in the end, really defines us?
Many years ago, when I was much younger and slightly more physically fit, I had the privilege of serving as a member of the Presidential Honor Guard. To an outsider, this may sound like a really glamorous assignment, and I guess to some extent it is, but believe me when I tell you, it’s not what most people think. Sure you get to do some really neat things like ceremonies at the White House and parades at the Pentagon, but the hours are long, the work’s demanding, and the expectations for perfection are through the roof. What most people don’t realize is that much of your time as a soldier in the Honor Guard, is spent inside the walls of Arlington National Cemetery conducting funerals.

During my tour in Washington, I participated in over 1,000 funerals. Primarily, because I spent a year as the funeral and wreaths officer, and all I did was to go to funerals. But anyone who has ever been a member of the Honor Guard has certainly spent many long and difficult hours inside the “bone-yard,” as we called it.

There are five companies of soldiers that perform the ceremonies. They have the letter designations A (Alpha) through E (Echo). Each company rotates through a training cycle taking turns doing different things, but two out of every five weeks are spent conducting funerals. You spend one week as the back-up funeral company, and a second as the primary company. When you’re the primary company, it’s not unusual to conduct 10 or 12 funerals in a day.

Now, not every soldier in the company is involved in every funeral. Everyone loads up onto a couple of busses, heads into the cemetery, and spreads out to do the funerals they’ve been assigned.

Some funerals are big and involve almost an entire company, while others are small and involve only a couple of soldiers. So what determines whether the person being buried gets a big or small funeral? Their rank of course, it’s the military, what else would you expect!
A Private gets a simple honor funeral with a Casket Team, a Firing Party and a Sergeant-in-Charge. A General or Admiral gets; two Escort Platoons, a Marching Band, a Caisson pulled by six horses, a Rider-less Horse with a boot turned backwards to symbolize the fallen rider, an eight-man Casket Team, a Flag Team, a Firing Party, an Officer-in-Charge, and maybe even a Fly-by of F-16s. A State Funeral for a President involves literally thousands of people from all five services. It’s really an impressive event.

Much of the Honor Guard’s training is focused on its military precision. Every facet of the funeral is evaluated and graded. The Casket Team must keep the casket parallel and level to the ground at all times. A Firing Party has seven riflemen who fire three volleys for a 21 gun salute. Each volley must sound like a single shot, one crack, perfectly synchronized. The flag must be folded into a perfect triangle with no red or white stripes showing, and with four white stars aligned along the fold. Soldiers spend dozens of hours practicing these tasks before they are allowed to participate in an actual funeral.

The hardest part of any funeral is being up close to the family. It’s particularly difficult for the Officer or Sergeant in Charge, who presents the next of kin with the folded flag, and expresses the condolences of a grateful nation. But those jobs are always given to the guys with the most experience.

They integrate the new soldiers into the Honor Guard in a slow and deliberate manner, in order to prepare them for their duties. At first the new guys are only allowed to observe a funeral from a distance. Then they join the Escort Platoon which stands a hundred feet or more from the grave site. Finally, when they’re ready, they can become a member of the Casket Team or serve as the Officer or Sergeant in Charge, where they’re right at the grave site interacting with the family.
This gradual integration is not just some type of rite of passage. It’s part of the process that emotionally prepares the soldiers to be able to function and perform their duties in the presence of a grieving family. It would be devastating if a soldier broke down or lost his composure in front of the family. That is simply not acceptable.

The first couple of funerals you participate in are always the hardest because you can’t help but focus on the grieving family. But you very quickly learn to detach yourself from the event. Not because you don’t care, or because you’re callous, you just have to. It becomes a matter of emotional survival. You have to be able to do your job and function in the manner in which you’ve been trained.

I guess it must be similar to what doctors and nurses have to do. After you’ve been doing it for a while you kind of build up an emotional detachment that acts like a protective wall around yourself. But you know all walls can be breached.

I buried a lot of people and saw a lot of different things. I buried a famous World War II general who was the grandfather of a college buddy. I participated in the State Funeral that interred the Unknown Soldier from Vietnam. I’ve witnessed wives and ex-wives, mother-in-laws and daughter-in-laws get in fist fights over the flag. I’ve even had to help chase down a run-a-way Caisson. But the one funeral I remember most wasn’t for anyone famous, or anyone of particular rank. It was for a military dependent.

A dependent is a relative of someone in the military, and it’s not unusual for a dependent to be buried at Arlington. Typically, it’s an elderly widow being laid to rest along side her husband, but that’s not always the case.

It was a magnificent spring day, the cherry blossoms were in bloom, and we were finishing up our week as primary funeral company.
Everyone was looking forward to getting back to the barracks and
starting the weekend. We had one funeral left, and all we knew was that
it was for a dependent. But that’s a pretty easy job because there’s really
no ceremony. There’s no rendering of honors; no flag to fold, and no
firing party. Just a Casket Team to take the casket out of the hearse and
carry it to the grave site. They simply place it on top of the grave and
march off.

We were all on the bus waiting on the last Casket Team to finish,
parked a distance away from the grave site, but close enough to be able
to observe the funeral. The hearse pulled up, and the funeral director
moved to the rear of the vehicle, and opened the tailgate. The Casket
Team stepped forward to remove the casket. As they slid the casket out
of the hearse, we could see that there was something very different.
Only four of the six-man team carried the casket. The casket was only
about 3-feet long. We suddenly realized that it was a small child, or
maybe even an infant.

The team carried the casket to the grave, gently set it down, and
marched off toward the bus. There were only a handful of people at the
grave site; a young soldier, his wife, and a couple of mourners. As the
Casket Team boarded the bus I could see that they were visibly upset.
Some of them had tears rolling down their cheeks. One took his seat and
started to shake uncontrollably.

Nobody said a word, nobody. As the bus pulled out, and we
headed back across the river to the barracks, there was none of the usual
soldierly banter or chatter. No comments about the good looking girls in
the car next to us, or boastful talk about the pending weekend’s
conquests. The entire ride home was silent. Our hearts and thoughts
were still inside Arlington with that young couple.
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Every man on that bus was affected by what he had seen. Some of the older soldiers, who had children of their own, were very emotional. I felt ill. My head pounded. My throat burned, and I had an achy feeling in the pit of my stomach. I was physically exhausted and could barely muster the strength to stand up and get off the bus.

I fought hard trying to erase the image of that young soldier and his wife sobbing next to that tiny casket, but I couldn’t. Although a lot of years have passed, I still get that sick feeling inside, whenever I think of that horrible day.

Why did that funeral affect us like that? Why does it still upset me?

Think about it. I’d never met those people before. They were strangers. We didn’t share a history. There was no psychological or emotional bond between us. Yet, the response I had to their pain was very real. Their pain became my pain, their grief became my grief. Obviously, not to the extent that they felt it, I would never presume that; but I felt it just the same. It was real. It physiologically and emotionally affected me. Why?

Was it sympathy or empathy? Looking back at it, I realize that it was probably a combination of both. Whatever it was, it was real, and it was intense, and I will never forget that feeling.

What is empathy anyway?

I guess the answer depends on who you ask. Philosophers, psychologists, and more recently, neuroscientists have all studied and debated empathy. To me, it’s pretty straight forward. Empathy is the ability to experience the thoughts or feelings of another person. But then again, I’m not a philosopher, psychologist or neuroscientist.

Philosophers see empathy as the primary means by which we can recognize each other as “like-minded creatures.”
What’s that supposed to mean?

Well, for example, it’s kind of like saying that because you feel sad when something bad happens to you, and I feel bad when the same thing happens to me. We are therefore, alike, and because we’re alike, we can know each other, and know each other's minds. And I guess that makes sense.

Philosophers consider empathy a necessary and vital component in the development of human beings as moral agents. Empathy helps us figure out what’s right and what’s wrong. In other words, we should “do unto others” as we would have done to us, because we can understand and empathize with what it’s like to be wronged. Again, I guess that makes sense.

Psychologists are interested in studying empathy in the context of human behavior. They have an entire range of theories to explain how empathy motivates people to act and behave in certain ways. They design experiments to see if empathy motivates people to act in unselfish or altruistic ways, or if people act unselfishly, simply because they don’t want to feel bad about not doing something good. I know that I make it sound silly, but it really provides some valuable insight into the human psyche.

Psychologists have found that infants reactively cry to the distress cry of another infant. They call it emotional contagion, or state-matching, and believe that it’s the foundation of any empathetic response.

Apparently, babies are unable to differentiate between the distress or discomfort of another baby and their own distress. But any maternity nurse could tell you this. Once one baby starts crying, they all start crying, because the distress of one becomes the distress of all.
Then, as we begin to grow, we become aware that we are separate entities. We develop a sense of self and our emotional response to the distress of others starts to change. Psychologists say that it becomes more sophisticated and rational, whatever that means.

Neuroscientists, look at empathy as a physiological response that occurs within the human brain. They’ve used Magnetic Resonance Imaging (MRI) equipment and other devices to record the brain activity of someone undergoing an empathetic response, and what they’ve found is truly remarkable. When we empathize with someone our brain actually assumes a similar biological and chemical condition as the person with whom we are empathizing.

The other day I was looking out my office window and saw a young child and his mother walking across the parking lot into a bank. The mother was busy trying to get her checkbook out of her purse, and really wasn’t paying much attention to the little kid. The child was having difficulty, keeping up and fell. I instinctively winced, clenched my teeth, and then felt upset. The mother scooped up the child, gave him a hug, and everything was all right. But why did I have that reaction?

Obviously, the child was undergoing a fairly traumatic experience. He was physically hurt and in pain, probably scared, definitely upset, and maybe a little panicky. If we had been able to take an image of his brain activity, it would have looked like a lit up Christmas tree. The part of the brain that deals with pain would have been flashing red. The part that controls the frightened and scared feelings would have been bright green. And the part of his brain that says to him “my Mom’s leaving me, and I’m going to be alone” would have been screaming yellow.

Now, I didn’t have any flashing red in my brain because I wasn’t physically injured. However, the other parts, the parts that control the upset and alone feelings, were green and yellow. The part of my brain
that deals with the sense of self physically responded in the same manner as the child’s. How amazing is that?

How does this happen? Why does it happen? Does this happen to all species or just humans? Is it something we learn to do, or is it some type of involuntary response?

Well, scientists think it has something to do with what they call mirror neurons.

About twenty years ago, Professor Giacomo Rizzolatti and some other neuroscientist at the University of Parma in Italy, were working with Macaque Monkeys. They were measuring the monkeys’ brain activity. They hooked-up electrodes to the monkeys’ heads, had them do different things, and recorded the neurons that fired.

They noticed that if a monkey picked up a peanut and put it in a box, one set of neurons fired. However, if the monkey picked up a peanut to eat it, a different set of neurons fired. That by itself is pretty interesting because it suggests that the intent behind the action and not just the action itself helps determine what neurons fired. But, that’s not the real discovery.

Rizzolatti and his colleagues also noticed that the monkeys that weren’t doing anything, the monkeys that were just sitting in their cages observing, had the same neurological response as to the ones with the peanuts. In other words, the neuron activity in the observing monkeys mirrored the neuron activity in the active monkeys, hence the term “mirror neurons.”

Some scientists theorize that mirror neurons play an important role in giving humans (and even some primates) the ability to mimic. If you make a funny face and stick out your tongue at a little baby, the baby will mimic you and stick out its tongue. Babies usually just cry when I do it,
but for most people they’ll stick out their tongues. It will even work with new born monkeys.

The ability to mimic, some speculate, provides the basis for human learning and explains the evolution of language, culture and all those other traits that make us human.

The human brain reached its current size and maybe even its intellectual potential about 250,000 years ago. But the emergence of language and culture only occurred about 40,000 years ago.

So, what took so long? What happened during those 200,000 plus years in between?

Not much really. Genetically anyway, our brain hasn’t changed all that much in the last quarter of a million years. It seems to be more a function, of how we learn. We literally learn by the “monkey see monkey do” method. About 40,000 years ago one of our early ancestors figured out how to make fire, and the knowledge quickly spread. It’s kind of like that hair coloring commercial where she told two friends, and they told two friends, and so on, and so on.

Then someone else figured out how to make tools, then clothes, a mud hut, then language, math, art, music, science and so on. Each new acquired skill and technological innovation gets added to the depository of human knowledge, helping to accelerate the pace at which we progress.

Remember, there were literally more scientific breakthroughs and technological advancements during the 20th century than in the combined 6,000 years of human history that preceded it.

From an evolutionary perspective then, the mirror neuron theory makes a lot of sense. It’s easy to see how mimicking and learning could help a comparatively weak and vulnerable species like humans, not only survive, but flourish, and even dominate the other species.
Man is sometimes called the "Machiavellian Primate" because he has the ability to know the minds of other people and animals, and uses that information to his advantage. And it’s this particular ability, more than anything, that’s helped us climb to the top of the food chain.

Now, I can understand how mirror neurons can play an important part in natural selection and the survival of the fittest, but empathy seems to contradict Darwin’s theory of evolution.

Think about it. Empathetically “knowing the mind” of another person may give us an advantage in out-smarting them; but it also makes us vulnerable. When we empathize with someone, we put ourselves in a position where we can be taken advantage of. No one knows this better than children, con-men and politicians.

So why would we have developed (or why were we given) the ability to empathize or feel the emotions of others?

Evolutionary theorist Richard Dawkins thinks it has to do more with the survival of the species than the survival of the individual. The theory is that we’re motivated to act in ways that guarantee the survival of our genes, and not necessarily the survival of ourselves.

When we see someone in trouble our empathetic response causes the distinction between self and other to fade. It causes us to project ourselves into the other, and gives rise to a sense of oneness. So, when we empathize with someone and try to help, we’re really doing it to help the species, and ultimately ourselves.

I guess that’s possible, but it doesn’t do a lot for the cause of altruism or the concept of free-will. And it really doesn’t explain why some people choose to act while others don’t. For example, why are some people moved to become Carnegie Heroes, while others remain idle spectators?

What’s a Carnegie Hero?
On January 25, 1904 an explosion in a coal mine near Harwick Pennsylvania, trapped and eventually killed 179 miners. In the hours that followed the explosion members of the mining company and citizens of nearby towns rushed to the scene to try to rescue the trapped miners. Two of the rescuers, Daniel Lyle and Selwyn Taylor, lost their lives trying to help those buried 200 feet below the ground.

There was only one survivor. Adolph Gunia, a 16-year-old German immigrant who lost both his father in brother in the explosion. The Harwick Coal Mine explosion still ranks as one of the worst mining disasters in U.S. history.

The philanthropist Andrew Carnegie was so moved by the accounts of Lyle’s and Taylor’s sacrifice that he decided to establish the Carnegie Hero Fund. Carnegie’s vision was to establish a foundation that would recognize and reward the actions of real world heroes. Not soldiers, policemen and firefighters, or anyone whose job it was to come to the aid of another. Carnegie wanted to recognize the regular guy; the ordinary man or woman who risks their own life to save the life of a stranger.

Since 1904, 80,000 people have been nominated for Carnegie Medals, and 9,000 have been awarded. About twenty percent of the medals are awarded posthumously.

Samuel Oliner is a Professor of Sociology at Humboldt University in Arcata, California. He devotes a chapter of his wonderful book, *Do Unto Others, Extraordinary Acts of Ordinary People* to the Carnegie heroes.

Professor Oliner interviewed 214 Carnegie heroes in order to get a better understanding of what motivated these people to act. Learned values, a sense of social responsibility, empathy, the belief in doing
good, instinct, religious beliefs or guidance from a higher power, and reciprocity were the reasons most often given.

Professor Oliner includes excerpts from many of his interviews in the chapter. The accounts of the rescues are inspiring, and the words of the heroes themselves are riveting. For me there was a common theme that echoed through many of the interviews. These heroes seemed to be compelled to act. Phrases like: “I knew I needed to do it”; “You just do what you’ve got to do”; “It’s like something in your mind says Go Help”; “It’s like another person in me”; and “I can’t explain it, it was just response,” kept appearing in the interviews.

What is this voice, this other person inside, this internal force that compelled these people to act, thereby putting themselves and their own lives at risk to save another human being?

We all like to think that we’d do the same if we found ourselves in a similar situation, but would we?

The truth is most people don’t act. Most people don’t get involved. What makes these people different? I always thought that self preservation was our most basic and strongest instinct. What is it that made these people ignore that instinct and put their own lives in jeopardy? Twenty-percent of the Carnegie heroes actually sacrificed their lives in their attempts to save another. Why?

Perhaps Professor Dawkins is right. Perhaps we have some type of biological alarm that goes off inside of us, whenever we see our genes in trouble.

Studies have shown that we tend to be more empathetic towards people that are genetically similar to us. We are far more likely to feel empathy for a family member or friend, then someone we don’t know.

So, maybe it’s our genetic familiarity that causes us to project ourselves into another. This, in turn gives rise to a sense of oneness,
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which enables us to feel what the other person is experiencing. It makes sense. It’s a biological trick or illusion that has evolved in order to help the species survive. And maybe, it’s this illusion of oneness that compels Carnegie heroes to act.

However, that argument really doesn’t make sense because most of the Carnegie heroes risked their lives to save complete strangers. Other than being a human, there was no real genetic or emotional bond.

So, what is it? Why do some people rush into burning buildings to rescue someone, while others stand-by and watch?

Professor Dawkins could still be right. It could be the overwhelming sense of oneness, the merging of self with another, that compels these people to act. But maybe it’s really something more, something that goes much deeper than genetics, that’s the actual bonding agent? Maybe it’s something spiritual?

Think about it. If there is a God, and God is the sum of all creation, then we exist inseparable from, and as a part of God. If this is true, then we also must exist inseparable from, and as part of each other.

It gets back to the whole idea of the Buddha-Nature, the Mystical Body, or Universal Mind. If there is, indeed, a creator, from which all things came, and within whom all things dwell, we exist not as individual conscious entities, but as part of the one true consciousness, which is God. We respond to the pain and desperation of another person because it is a response to our own pain and desperation.

Why do infants cry at the distress of another infant?

Well, there’s been some extremely enlightening and interesting research done to help explain the infant mind. Allison Gopnik is a Professor of psychology and philosophy at the University of California at Berkley. Her research indicates that an infant’s brain is simply wired differently than an adult’s brain. It contains more brain cells than ours,
and has fewer of the inhibitors that can restrict the neuron activity in the adult brain.

Apparently, as we grow and start to mature, our brain undergoes a kind of “pruning process.” It starts eliminating unnecessary neural connections, making the brain more efficient, and better able to focus on grown-up tasks like paying bills, and balancing the checkbook. It’s also why children have such short attention spans, and why most adults have ones that are only slightly longer.

Anyway, the pruning tends to restrict the way in which the adult mind perceives the world. A baby doesn’t block anything out. An infant’s view of reality is unfiltered. They cry at the distress of another baby because of the way they perceive reality. To an infant, the distress of another is literally their own distress.

Perhaps the infant’s perspective of reality is the true perspective. For the most part, we come into this world with a pure and unspoiled mind. But as we grow, our mind starts to become cluttered with a developing sense of self. Our ego forms and we begin to view the world through a “peep-hole” of self that restricts our view of reality, and creates the illusion of separateness. It could be our most fatal flaw.

Think about it. We spend our lives building walls around ourselves; walls that we mistakenly think will protect us. Walls that in actuality only reinforce the illusion of separateness, increase our isolation, and create the conditions in which we are free to inflict pain and suffering on another.

But there are moments in our lives when those walls get breached. Moments like watching a young couple clinging to the casket of their child. Or when we unexpectedly come across another human life in danger, and at the risk of our own life, are compelled to act. It is during these moments that we are unable to suppress the reality of our true
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nature. It is during these moments that we have what philosopher Susanne Langer has described as an involuntary breach of individual separateness. It is during these moments that we become unconsciously aware of the oneness that we actually are.

In *Do Unto Others* Professor Oliner explains that altruism is the eradication of self-centered desire, and a surrendering to selfless love.

In 1942 Samuel Oliner was a twelve-year old Jewish boy living in occupied Poland. He owes his life to just such an act of selfless love. Balwina Piecuch, a simple peasant woman, risked her own life, and the lives of her family, to shelter Oliner from the Nazis, and help him survive the Holocaust.

In 1990, Yad Vashem, an Israeli organization dedicated to Holocaust remembrance, recognized Balwina and her son Stanislaw as, “Righteous Among the Nations.” On the medal that her family received is an inscription from the Talmud, which reads; “Whosoever saves a single life, saves an entire universe"(Mishnah, Sanhedrin 4:5).

Perhaps this ancient Jewish wisdom is more than just a moral teaching because the passage continues. It says that the universe was created for the sake of the one; for the sake of the one who created it, and for the sake of the ones that live in it. Maybe it’s simply a description of reality.

So, the inscription on Balwina’s medal is true. Whoever saves a single life saves an entire universe because whatever, we do unto another, we literally do unto all.
Great Expectations

Last summer, my buddy Steve and I planned a day trip for our kids. The plan was to get an early start and drive down to Newport Rhode Island, where we’d spend the better part of the day touring some of the mansions. On our way home, we’d stop off and have a nice Italian dinner in the Federal Hill district of Providence, and then cap-off the day by taking in a Pawtucket Red Sox game.

We thought the kids would be thrilled. They were obviously excited about the baseball game, what kid wouldn’t, but the rolling eyes and scrunched up noses told me that they weren’t all that enthusiastic about the mansion tour. Steve and I were subjected to a chorus of “Who wants to go see some old houses?” and “What’s the big deal, anyway?”

I’m sure that they would have preferred dropping a couple of hundred dollars at the arcade in the Providence Mall, but seeing as how the adults were both driving and paying, they were going on the mansion tour, whether they liked it or not.

We pulled into the visitor’s center around ten o’clock, picked up our tickets, and headed across the street to the first mansion on our tour; the 70 room summer cottage of Cornelius Vanderbilt, The Breakers.

As we passed through the large rod iron gates that guarded the grounds, and started up the carriage path towards the mansion, we heard; “Oh my God, it’s huge!” “Someone actually lived here?” and “You got to be kidding me!” Each room we entered in the modest little cottage invoked similar comments.

We finished our day in Newport with a behind-the-scenes tour of the Elms where we got to see everything from the boiler room in the basement to the servant’s quarters in the attic.

Dinner in Providence was excellent, and the Paw Sox game was a lot of fun, but it was the mansion tour that left the biggest impression. On our ride home that evening, Steve’s son Nathan remarked, “I thought
we were just going to see a couple of big houses. I had no idea they’d be like that.”

All in all, the day was a huge success because it exceeded the expectations of the kids. Chalk one up for the Dads.

Of course the downside to our success is that we’ve raised the bar. The kid’s expectations for our next day trip are going to be considerably higher. What do we do for an encore? We’ll probably end up at the arcade.

It’s always a great thrill when something exceeds your expectations, but why does it? Well, in the case of the kid’s trip to Newport, it would have to be their frame of reference.

Now, we’ve been fortunate enough to have been on a number of nice vacations. We’ve done the pilgrimage to Disney World, toured the White House, took a Christmas trip to New York City where we stayed in a beautiful hotel and took in a couple of Broadway shows, but nothing that the kids had ever experience could have prepared them for the opulence and grandeur of those mansions. How could it?

Outside of a couple of palaces in Saudi Arabia and Europe, people don’t live in homes like that anymore. It’s the legacy of the Federal Income Tax.

Anyway, I guess the moral of the story is, that if you want to have a good time, set low expectations.

A 2004 study conducted by the World Health Organization and Harvard Medical School reports that the United States is the most depressed nation in the world. Approximately, 9.6 percent of our population suffers from some type of mood disorder. This includes; major depressive, dysthymic, and bipolar disorders.
Great Expectations

In contrast to the US, Nigerians rank among the happiest people on earth, with only 0.8 percent of their population suffering from any of these disorders.

How is that possible? How could the richest and the most affluent nation in the history of the world have so many unhappy people? What’s wrong?

The study sites a number of reasons. People in the US are generally better educated about mental health, and more likely to report problems. Unfortunately, not all countries are as enlightened. In some cultures people with mental illness are often ostracized and sometimes even persecuted, so it’s easy to see how that could tend to reduce the number of cases they report.

American psyches are also impacted by violence, accidents, and substance abuse; all of which are found in abundance here. However, a big part of it has to do with our expectations.

According to Professor Ronald Kessler, one of the study’s authors, Americans get stressed out pursuing the “American Dream.” We set high expectations for ourselves and are driven to achieve more, make more, and acquire more than any previous generation, and the pressure of trying to keep up with the Joneses is starting to get to us.

That’s hard to believe. Every consumer statistic available indicates that our quality of life is better than our grandparents. We live longer, are 4 to 5 times wealthier, own twice as many cars, and live in much bigger houses.

What’s the problem? We make more, spend more, and have more than any previous generation. The United States makes up 4.6 percent of the world’s population but accounts for 33 percent of the global consumption. However, we rank only 16th in well-being, happiness, and
Great Expectations

life satisfaction according to the University of Michigan’s World Values Survey.

That can’t be possible, can it?

Well, I’m afraid that the proof just might be in the prescriptions because the Center for Disease Control reports that antidepressants are the most commonly prescribed class of drug in the United States, outpacing blood pressure medications, cholesterol medicines, and even headache remedies.

So, why are Americans so stressed out and unhappy? Are our psyches that fragile? What’s wrong with us?

Maybe we’re suffering from a hangover, but instead of feeling the effects of alcohol, we’re feeling the effects of materialism?

What’s materialism?

Well, materialism could be a preoccupation with the physical world, or it could be the philosophical position that the physical world is all there is. Either way, the focus is on the stuff, or material possessions, rather than on the things that are spiritual or intellectual.

Think about it. Doesn’t stuff seem to have a funny effect on people? It seems that the more you have, the more you want, but the more you get, the less it means to you, so the more you want.

I walked into the garage the other day and counted six baseball gloves strewn about the place; two catchers mitts of various sizes, a first baseman’s glove, two fielders gloves, and of course my glove, up on the shelf where it belonged.

I turned to my son Patrick and said, “Hey! What’s all this?”

“Sorry,” he said, “I was looking for something.”

“Well, pick up this stuff,” I replied, “You don’t treat your glove like that!”
Great Expectations

He just kind of looked at me with a puzzled look on his face and again said, “Sorry!”

He just didn’t get it. He couldn’t understand why I was making such a big deal out of a baseball glove.

It must be a generational thing because when I was a kid, a new baseball glove was something special. It was the talk of the neighborhood. “Did you see Murph’s new glove? It’s a Roberto Clemente, it’s wicked!”

Of course the kids in my neighborhood didn’t have five gloves. They had one glove that was probably a hand-me-down. A baseball glove doesn’t invoke that sense of excitement in Patrick because its common place. There’s nothing special about it because he has five of them.

Maybe we’re suffering from an imbalance, feeling the effects of our “shop till you drop” culture that emphasizes the pursuit and acquisition of things that are tangible and material, over those that are intellectual or spiritual.

In China, it’s known as the Yin and Yang. Daoist philosophy believes that human beings are products of heaven (Yin) and earth (Yang), and to achieve happiness, we must maintain an equilibrium between these two aspects of our nature. In other words, we have both a body and a soul. If we focus on one and ignore the other, we’re going to get out of balance and have problems.

It’s possible. Religion does seem to be waning in the United States. At least as measured in terms of the number of church goers. That number has been declining steadily since the mid 1950s. Maybe it’s just another indication of our slide towards materialism.
Great Expectations

Now, I’m not saying that simply having a religious affiliation makes one spiritual. I know plenty of people who attend church each Sunday, but who are anything but spiritual. I also know people who’ve never set foot inside of a synagogue, church, or mosque, but who are what I would call spiritually minded.

So, I get it! I realize that religion and spirituality are two different things, but there is certainly some type of correlation.

Maybe the quest for the “American Dream” has left us little time to pursue those things which are spiritual. Maybe we need to take some of Thoreau’s advice and simplify our lives. Like he said; “That man is richest whose pleasures are the cheapest.”

Think about it. Human beings are extremely complex creatures. If we don’t get the right nutritional nourishment, our body starts to break down. And, if we don’t get the right emotional nourishment, our psyche starts to break down.

So, if we are also spiritual beings, wouldn’t it stand to reason, that we’d need some type of spiritual nourishment? Maybe American’s are so wigged out because we’re not getting the spiritual nourishment that we need.

Now, the counter argument is that spirituality is really just an opiate, or another type of antidepressant. There is no God. Spiritualism, religion, and mysticism are all just a bunch of hokum. A simple bed time story made up to help our fragile little psyches deal with the finite reality of our own mortality. And I guess that’s possible, but at least you don’t need a prescription.

It’s possible that God does not exist. Of course, this only begs the question; if God does not exist, then where did everything come from. Well, one theory is that it came from the bulk.

What’s the bulk?
Great Expectations

It’s part of brane cosmology. The basic idea is that our universe is attached to a membrane that exists inside a higher-dimensional space called “the bulk.”

Imagine that you’re in complete darkness, a blacken space with no ceiling, floor, walls, or boundaries of any kind, just darkness. All around you, floating in the darkness are bubbles; millions of bubbles of all different shapes and sizes.

The bubbles are universes. They pop in and out of existence. Sometimes they collide and give birth to baby bubbles. The darkness is the bulk. It’s the only thing that always has been and always will be. It has no beginning and no end. There is no intelligence to it or behind it. It was not created and cannot be destroyed. There is no purpose or reason for its existence. It just is.

I’m not saying that membrane theory is wrong. There could indeed be a bulk. I simply choose to believe that the bulk has brains as well as branes. I reject the notion that the bulk is a meaningless void that exists without purpose or intent. I choose to believe that there is an intelligence to it that assigns itself and everything else purpose and meaning. This is what I choose to call God.

Maybe I choose to believe because my fragile little psyche can’t deal with the reality of my own mortality? Sure, that’s certainly a possibility. And maybe I choose to believe because I can’t accept the idea that I live in a world that has no purpose or meaning. Yes, that’s most definitely the case. But most importantly, I choose to believe simply because it’s what I want to do. I want to believe in God, so, I choose to believe in God.

Now that I’ve decided to believe in God, the question for me to consider is; what type of God am I going to believe in?
I thought God was God. I didn’t realize we had a choice. If you think about it, we really do.

However, I have to preface this, because no matter what type of God, we choose to believe in we’re going to be wrong.

Again, think about it. The intelligence that created creation, if it exists, has to transcend the physical reality of space and time. Even if it is simply an intelligent bulk, it is infinite. The human intellect is finite, and limited by human language. How could we ever hope to encapsulate an infinite intelligence within the constraints of a finite intellect? We can’t. As soon as we say “God is,” we’re wrong because whatever God is, it’s beyond the boundaries of the human intellect and language.

So, why bother to try? We bother to try because it’s what we’re designed to do. It’s like asking: why bother to breathe? Breathing is involuntary. You can’t stop yourself from breathing. Even if you try holding your breath you can’t stop because you’ll pass-out and your body will take over and start breathing again. The human mind is designed to seek the truth, and if God is the truth, then the human mind is designed to seek God. It’s what we do, or at least what we’re supposed to do. So, we try!

What then do I choose? What type of God do I choose to believe in? Understanding that whatever I choose will be wrong, and that my finite intellect is incapable of grasping the reality that an infinite God exceeds the sum of the infinite possibilities, I must at least try to consider the possibilities. I call these possibilities; God the clock-maker, God the referee, and God the high stakes poker player.

God the clock-maker is the intelligent bulk; both the author of the physical laws that govern reality and the laws themselves. God is the order behind creation. God is conscious and aware of all creation
because all of creation is subject to the laws that govern it. God is the
designer and the design, the clock-maker and the clock.

Creation exists simply because it is inseparable from God. There
is no reason for its existence other than it is.

God the clock-maker need not be moral, unless of course we
discover that morality is subject to the physical laws that govern creation.
God need not be compassionate, kind, or loving, unless of course we
discover that these too, are subject to the physical laws of creation.
God’s only concern is that creation adheres to the physical laws that
govern it. The clock simply ticks.

Isn’t this like saying that there is no God? Not really. God the
clock-maker might not resemble the personal God that most of us have
been taught to believe in, but it is still a possibility. God the clock-maker
is the God of science; the God that Einstein pursued, and it is ultimately
the Theory of Everything.

God the referee is more like the traditional God of western
civilization. A referee participates in a game to ensure that all players
and even the game itself adheres to the rules. But God the referee is a
personal God because this God is the author of both the physical and
moral laws of nature. God is part of creation because God has embedded
these laws into the fabric of creation, where we in turn discover them.
God also stands apart from creation because God must be the ultimate
enforcing authority.

The physical laws of nature are absolute and cannot be violated.
However, the moral laws are different. Although they are absolute, they
can be violated by the free-will of the moral agents that discover them.

So, God the referee must be the ultimate moral agent who holds all
other moral agents accountable and responsible for their adherence to the
moral law.
It is God the referee’s authorship of the moral law that makes God a personal God. And being a personal God, God can be compassionate, loving, and kind, the absolute of all the traditional attributes that we ascribe to God. God the referee is the God of religion, the God of Moses, and is the reason for everything.

God the high stakes poker player, at least to my mind, is a different type of God. Now, I’m sure this God exists in some religious tradition or theology. It may even exist within the Judeo-Christian tradition, but I have not come across it in my reading. So, I make no claim that this is a new or original interpretation. It is simply another possibility.

I can imagine that God is like a high stakes poker player taking all his chips and throwing them into the pot. God the high stakes poker player is similar to the clock-maker because it is inseparable from creation. But it is also like the Referee because it is a personal God. What makes this God different is the element of self-sacrifice. God the high stakes poker player went all-in, held nothing back, and threw everything into creation.

All of creation exists within God and all of God exists within creation. They are indivisible and inseparable. God is conscious and aware of all creation because it is God’s self-sacrifice that manifests God’s presence within all of creation. Creation exists because of the sacrifice and the sacrifice is creation. It is the sacrifice that gives creation its purpose and meaning. It is the sacrifice that makes God a personal God. It is the sacrifice which is the basis of all physical and moral laws. It is the sacrifice which created, sustains, and directs creation. The sacrifice is the ultimate expression of love.

We exist as part of and inseparable from creation. We exist as part of and inseparable from God’s sacrifice. We exist as part of and
inseparable from God’s love. We are the physical manifestation of God’s love. God the high stakes poker player is simply everything.

So having considered the possibilities, what do I choose? What type of God do I choose to believe in?

I don’t know, all of them, maybe none of them. I’m not sure. I don’t think that there’s a right or a wrong answer. Maybe it’s the question and not necessarily the answer that’s important. Maybe I’m just supposed to keep asking myself the question; God is, and keep trying to figure it out.

Honestly, I don’t think that I’ll ever come up with an answer. Not in this life anyway. I don’t think it’s supposed to work that way, at least not for me anyway. But maybe some day, maybe if my consciousness endures, if some part of me is truly spiritual and continues on after my physical existence has run its course, maybe then I’ll know.

I’m not too sure what I’ll find, I’m not even sure what I expect to find, but this, I know with absolute certainty; whatever it is, whatever the ultimate answer turns out to be, it will without a doubt exceed even my greatest expectations.
Oscar Pistorius is a 21-year old Olympic hopeful from Pretoria South Africa. He runs track; the 100, 200 and 400 meter sprints. On July 16, 2008 in an Olympic qualifying meet in Lucerne Switzerland, Oscar ran a personal best time of 46.25 seconds in the 400 meter sprint. Unfortunately, it wasn’t good enough. He missed qualifying for the Beijing Games by a mere seven-tenths of a second. However, Oscar is relatively new to sprinting. He’s only been running for about 4-years. He started in high-school when he was rehabbing a rugby injury and took to the track like a duck to water. So really, just making it to the qualification meet is a pretty amazing feat. But again, he’s only 21, so he has his sights set on the 2012 Summer Games in London.

But Oscar has his work cut out for him. The 400 meter is one of the most physically demanding races there is. There’s no pacing yourself. You run as fast as you can for a quarter mile, one lap around the track in an all out sprint. Your legs throb, your sides ache and your lungs literally burn. Believe me, it's a killer. It’s the main reason I chose to throw the shot-put in high-school.

The 400 meter is a race in which hundredths of a second can be the difference between winning a losing, qualifying and not qualifying. And Oscar is probably going to need to shave a full second off his time to make it to London. That’s huge! But most sprinters don’t come into their prime until their mid twenties, so Oscar should be right in that window come 2012. There’s no questioning his work ethic. If it can be done, Oscar’s going to do it.

However, even if Oscar meets the qualifying time he’s still going to have to overcome the International Association of Athletics Federations’ (IAAF) Rule 144.2. IAAF Rule 144.2 prohibits the use of any technical device that incorporates springs, wheels, or any other
element that provides the user with an advantage over other athletes not using such a device.

See, Oscar Pistorius doesn’t have any legs. He was born without fibulas or calf bones, and had his lower legs amputated when he was only 11-months old. Oscar runs on carbon fiber prosthetics called cheetahs. It’s a blade that looks something like the handle of a soup ladle.

The IAAF had actually banned Oscar from competing in the able-body Olympics because tests conducted at the German Sports University in Cologne suggested that the cheetahs were more efficient than human limbs, and enabled Oscar to run using 25% less energy than a runner with legs. The IAAF lifted the ban after the Court of Arbitration for Sport ruled in Oscar’s favor. But again he failed to make the qualifying time, so he missed out on Beijing.

Obviously, Oscar is not going away, and neither is the controversy. More tests will be conducted to determine if the cheetahs really do give a double amputee an advantage over an able-bodied athlete.

I have no idea what the final verdict is going to be or whether or not Oscar will be able to compete in the 2012 Olympics, but it’s going to be interesting to see what happens.

On one hand Oscar Pistorius is a remarkable young man and an inspiration. You can’t help but root for him, and I’d really like to see him on the track in 2012. On the other hand, if the cheetahs really do give Oscar an advantage, it wouldn’t be fair to the other athletes.

What I find most remarkable is that we are quickly approaching the threshold were “augmented human beings” can out-perform able-body human beings.

Think about it. An artificial limb is potentially better, at least in terms of helping someone run, than a real limb. How amazing is that?
And Oscar’s prosthetics are primitive compared to what will soon be available.

In 1973 ABC aired three pilot movies loosely based on the Martin Cardin novel *Cyborg*. They starred Lee Majors as Steve Austin, an American Astronaut rebuilt with bionic body parts after his experimental aircraft broke up and crashed.

“The Six Million Dollar Man” ran for 5 seasons and 100 episodes. The one minute and thirty two second introduction is perhaps one of the best ever. It opens with the dramatic video of the aircraft crashing into the desert floor. Suddenly, the viewer is taken inside an operating room where an army of specialists are working on the critically injured pilot.

The voice-over begins:

“Steve Austin, Astronaut – a man barely alive. Gentlemen, we can rebuild him. We have the technology. We have the capability to make the world’s first bionic man. Steve Austin will be that man - better than he was before; better – stronger - faster.”

Steve Austin’s bionic legs enabled him to run at 60 miles per hour. His bionic arm gave him superhuman strength. His bionic eye endowed him with 20 to 1 zoom vision, and a bionic ear gave him canine like hearing. These along with the fact that he was married to Farrah Fawcett made him the coolest superhero ever.

Of course, back in 1973 bionic limbs were science fiction. Steve Austin’s superpowers were slow motion special effects mixed together with a really cool sound track. It was great entertainment, but really not much more.

Today bionic limbs are no longer science fiction, they’re science. We really do have the technology. We really are on the verge of creating the world’s first bionic person. About the only thing understated in the 1973 version of the Six Million Dollar Man is the price tag. Today, six
million dollars is only enough to get your teeth whitened and eyes lasered, but the rest of it, it’s happening now.

The United States Department of Defense has budgeted $100 million to develop a bionic arm. There are over 300 scientists working at numerous academic institutions and research facilities to perfect a workable bionic arm, they’ve nick-named “The Luke Arm,” after the bionic hand given to Luke Skywalker in Return of the Jedi.

Amputees are already being outfitted with life-like first generation bionic arms that have four fingers, a thumb and the same range of motion as a real arm. Scientists are working on second generation prototypes that can be attached to the user’s skeleton and integrated into the nervous system so it can be controlled by the brain. They are even working on synthetic skin that provides the user with a sense of touch sensitive enough to pick up a grape or crack and egg. It may not be strong enough to stop a bulldozer, like Steve Austin’s arm, but it will definitely improve the quality of life for thousands of amputees.

Of course, what’s making this revolution in bionics possible is the computer chip, or micro processor. Computer chips are getting smaller, faster and more powerful, and are being integrated into all sorts of bionic devices.

There are artificial legs with smart knees that keep the user stable, allowing them to walk and even run with a natural gate. Miniature pumps that read blood sugar levels and automatically dispense insulin are being implanted in diabetics. Portable dialysis machines worn on the belt are giving kidney patients a new found freedom and better quality of life. They’ve even developed a bionic eye wired directly to the brain that’s helping to restore sight to the blind.
And this is only the beginning. These are really just first generation devices. They will continue to improve; becoming cheaper, more efficient and more effective.

We are entering an era where we will experience the merging of man and machine. We will not only augment, but we will actually enhance human beings. It will make the bionic limbs of the Six Million Dollar Man look as primitive as Oscar Pistorius’ carbon fiber prosthetics.

Bionic limbs, artificial organs, and even memory chips will, without question, increase both the quality and quantity of our life span. But when you get right down to it, they’re really just medical implants, more sophisticated but similar to a titanium hip. There is nothing about these devices that will dramatically or permanently alter the human species. Those type of evolutionary changes belong to nature, and now quite possibly, to the genetic engineers.

The human race is still evolving. Seriously, we are. A study by Henry Harpending of the University of Utah and John Hawks of the University of Wisconsin-Madison suggests that at least 7 percent of human genes have experienced evolutionary changes as recently as the last 5,000 years. In fact, the rate at which we’re evolving is actually increasing. Harpending and Hawks estimate that we’ve evolved 100 times faster over the past 10,000 years, then at any other time since the early hominids split from the apes.

What does this mean?

It means that evolution is an on-going process. We don’t reach a certain level and stop evolving. The human species continues to evolve and change in response to its environment. That’s why adults living in Sweden and Denmark can digest milk. They’ve adapted to the dairy farming which is part of their environment. While in other places in the
world, like Africa or China, most adults can’t digest fresh milk. But the process of evolution is slow. Species altering changes occur over thousands of years, and not from one generation to the next. That is of course, unless we step in and help it.

On June 26, 2000 President Bill Clinton and Prime Minister Tony Blair held an unprecedented joint video conference in which they announced the successful mapping of the human genome. It was the high water mark of a 15-year effort that involved over a thousand scientists from a half-dozen different countries. Actually, it was only a draft copy of the genome map. The final version wouldn’t be complete until 2003. None the less, it was a historic moment. It was the announcement of possibly the greatest discovery in the history of mankind.

Naturally, the video conference was an orchestrated event put on for the benefit of those paying for the project; namely, the American and British tax payers. The politicians used it as an opportunity to praise each other’s leadership and vision, while the scientists and researches used it as an opportunity to kiss-up to the politicians. And there’s nothing wrong with that. That’s just the way it works. But in between all the congratulations and mutual admiration, there were some extremely important and thoughtful remarks. All involved talked about both the promise and peril of this new found knowledge.

The greatest promise of the Human Genome Project is in the diagnosis, prevention and treatment of the diseases that afflict the human race.

Initially, scientists will use this knowledge to develop more powerful, effective and safer drugs. The new drugs will be genetically customized for each patient. They will target and eliminate disease without any harmful or negative side effects.
Already, Oncologists are using a patient’s genetic information to help develop customized protocols that appear to be more effective and less invasive in treating certain types of cancer. Its potential is life altering. As President Clinton said in his video conference remarks, “In fact, it is now conceivable that our children's children will know the term cancer only as a constellation of stars.” How exciting is that?

The next application of the knowledge gained from mapping the human genome will be in gene therapy. In gene therapy, scientists attached healthy genes to something like a cold virus and inject it into the body. The virus then seeks out the defective genes and replaces them with the healthily ones, effectively curing the disease.

On-going research suggests that gene therapy could one day be used to effectively treat cancer, Parkinson’s disease, cystic fibrosis, immune deficiencies and even baldness. In fact, the list of diseases that gene therapy promises to be able to cure is potentially endless. However, the greatest potential and perhaps peril, comes from germ-line engineering.

In germ-line engineering the egg or sperm is genetically modified to eliminate any defects and improve the health of the off-spring. Germ-line therapy could potentially eliminate all hereditary diseases like sickle cell anemia or hemophilia. But if germ-line engineering can be used to repair genetic defects, it can also be used to modify or enhance a baby.

Scientists in Japan have recently re-engineered marmoset monkeys to glow fluorescent green. Seriously, they have. They took the green fluorescent protein found in jelly fish, spliced it into the monkey’s DNA, and produced glow in the dark monkeys. And what’s even more amazing, is that the monkey’s pass their unique fluorescent green color onto their off-spring. In effect, scientists have engineered a new species of monkey.
So what’s the big deal? Other than you wouldn’t have to turn on the lights to make it to the bathroom in the middle of the night, what’s so special about glowing in the dark?

The big deal is the ethical concerns that it raises.

Up until now, most of the ethical concerns that have arisen from the human genome project have centered on personal privacy issues. There is a legitimate concern that a person’s genetic information could be used against them by an insurance company to deny coverage, or even used by a potential employer in making hiring or firing decisions.

On May 21, 2008 President Bush signed into law the Genetic Information Act which prohibits this type of behavior. But now we’re moving into a whole new area. Now, we’re talking about the knowledge and ability to actually alter or change the human species.

Think about it. We now possess the knowledge and technical capability to alter, change, and even enhance ourselves. And the changes that we make will be genetically passed on to our children. As Prime Minister Blair put it, we now possess our own instruction book that was previously known only to God. We are now in the driver’s seat. We now have the ability to control and direct the evolution of the human race.

It is no longer a question of if it will happen but when, because it is going to happen. Governments can pass all the legislation and laws they want, but the genie is out of the bottle. The knowledge and know how are out there, and someone is going to use it.

If you think that people won’t want to genetically engineer their children; guaranteeing that they’re smarter, faster, stronger and better looking than everyone else’s kids, you haven’t been to a little league baseball game lately. Of course it’s going to happen. It’s what people do. We’ll do anything, anything at all, to get a leg up on the competition.
Evolution and Change

The real question for mankind is; what are we going to evolve into?

Nick Bostrom is a Professor of Philosophy at Oxford University in England, and the Director of the Future Humanity Institute. His job is to think and write about questions like these. He has some fascinating thoughts about the future of human evolution.

Evolution has always been progressive. That is, life started out relatively simple, and then over time, became more organized and complex. Eventually, evolution produced a conscious life form capable of pondering its own existence and asking itself these really annoying questions.

That life form of course is us - humans. The general trend of evolution has always been positive, you know, for the better. But, according to Professor Bostrom, that might not necessarily be the case in the future.

Professor Bostrom definitely believes that technology is going to accelerate the pace of our evolution, but proposes that it could take us in an undesirable direction. Genetic engineering and the merging of man and machine could “lead to the gradual elimination of all forms of being that we care about.” It all depends on what forces and values drive our evolution.

In one of Professor Bostrom’s scenarios, productivity and efficiency become the driving factors of evolution. We evolve like honey bees, where the only bees that have any value are the ones that are directly involved in the production of honey. The other bees; the poet bees, musician bees and non-honey making bees are eventually squeezed out of the hive and driven into extinction.
The only way to avoid this disaster, Bostrom proposes, is by taking control of our own evolution. This he says, would require the development of a “singleton” that could guarantee and insure that evolution continues to move in a progressive and positive direction.

So, what’s a singleton?

A singleton is the ultimate global decision-making and enforcement authority. It could be some type of world government, an enlightened despot, or even a benevolent super computer. It has whatever power is necessary to handle any challenges to its authority and to solve all global coordination problems.

Bostrom believes that a singleton could arise if we evolved to the point where all individuals and cultures accepted the same values and goals, or from the universal acceptance of a self-enforcing moral code.

That’s all well and good, but there’s no such thing as a singleton, right?

Not necessarily. If you think about it, there are singletons found in nature. In fact, nature itself is a singleton. There are at least 18 physical laws of the universe that are uniformly enforced by nature. Newton’s law of gravity is an example. It works the same way everywhere in the universe and affects everyone and everything. There’s no getting around it. If you jump off the Empire State Building, you’re going to fall down, not up. There are no exceptions to the rule. So really, nature or perhaps, the intelligence behind nature is a singleton.

But, isn’t that like saying God is the singleton that controls the physical universe?

If you believe in God, if you believe that God is the intelligence behind the universe that regulates and controls the evolution of the universe, then yes, God is the singleton that controls the physical universe.
Even if you don’t believe in God, even if you just believe that the physical laws of the universe are there and self-enforced, then nature becomes the singleton. Either way, there’s something enforcing the laws, some type of singleton. So, singletons really do exist.

But those are just the physical laws of the universe, right? We have to accept those laws because they’re part of nature. The laws that Professor Bostrom is talking about are moral and ethical laws. Moral and ethical laws don’t work like that do they? I don’t think we can even come to a consensus on what those laws are, never mind creating a singleton that’s capable of enforcing them?

But it’s a good question. Is there a set of universal moral and ethical laws that everyone on the planet can agree to?

Let’s assume that Paola Zizzi’s “Big Wow” theory is correct, and that during the first moments of creation the universe had a conscious experience and became conscious, perhaps even self aware. And it was at that moment that the fundamental laws of nature were created and embedded into the fabric of the universe. What if that were true, what would it mean?

Well, it would mean that the fundamental laws of the universe exist independent of human beings. They simply exist as part of creation. We don’t invent them. The only thing we can do is discover them. We definitely know this is the case for the physical laws, but what if it also applies to the moral and ethical laws as well, like Stuart Hameroff has proposed.

Think about it. If there are universal moral and ethical laws that are like the physical laws of the universe; then they exist as part of nature, embedded in the very fabric of creation. We don’t invent them, we discover them. They are self evident. The only thing that we can do once we discover them: is to either accept or reject them. And really,
isn’t this what differentiates the physical laws from the moral and ethical
laws of nature?

The moral and ethical laws are subject to the free-will of man. There is no singleton, at least in this reality, that’s going to enforce them.

So maybe they’re more like truths than laws. I don’t know. But it really doesn’t matter because free-will doesn’t negate their existence. They still exist. And if they exist, if they are part of creation, then we should be able to find them. So, doesn’t it make sense that we should be able to recognize what they are and come to a consensus on them?

Ok then, what are they?

I’m not sure. There is, however, one moral and ethical truth that I know of, that really is universal. It’s been discovered time and time again by just about anyone willing to search for it. It’s The Golden Rule.

The Golden Rule; “treat others as you want to be treated,” is part of almost every major religion and belief system on the planet. Seriously, there are 5.4 billion people who are members of the world’s 15 most populous religions, and all of those faiths have their own version of the Golden Rule.

Some of these faiths, like Judaism, Christianity and Islam evolved from each other and are naturally going to share many of the same basic tenets. But others evolved totally independently.

So how is it possible that they all share this same common value or belief? I don’t know, maybe because it’s the truth?

Think about it. Think about Buddha, Confucius or Jesus, Mohamed or Moses, they were all basically looking for the same thing weren’t they; the truth, right? And somehow, their seeking and searching, their meditation, prayer and contemplation took them all to The Golden Rule. How amazing is that?
Maybe just like Newton discovered the Law of Gravity and Einstein discovered the Law of General Relativity, they discovered the Law of Commonality; the one moral and ethical truth that binds all human beings together: The Golden Rule?

Why then, is the world still so messed up? Why hasn’t The Golden Rule had a greater impact on humanity?

I’m not sure. Maybe it’s because it’s a moral and ethical law and subject to the free-will of mankind, and far too many people have chosen not to abide by it? But it could also be something even more fundamental. Maybe it’s because not enough people have discovered it?

But that doesn’t make any sense. Everybody knows The Golden Rule.

Sure, most people have heard of it, and most people even know what it says, but how many really understand it?

Again, think about it. How many people truly understand what The Golden Rule really means? How many people have put in the time and effort to seek it out and discover it for themselves?

Are there any examples that we can look to?

I guess we can look at the lives of the great mystics and teachers, but I think there are some more contemporary examples.

Consider the twentieth-century. How about Mohandas Gandhi, Dr. Martin Luther King Jr. and Mother Teresa of Calcutta? Look at their teachings and philosophies. Aren’t their lives, their example, and their very beings the personification of The Golden Rule?

Yes, but those were extraordinary individuals who lived extraordinary lives. It’s not realistic to think that the rest of us can ever hope to come close to them.

Perhaps, but then again, maybe they were just ordinary people who through their desire to seek out and know the truth, experienced an
extraordinary conversion, a transformation in the way they perceived and understood reality? Maybe they came to understand the true interpretation of The Golden Rule?

Just look at their lives. They lived and acted as if whatever they did to another, they literally did to themselves. And, maybe that’s the true interpretation; “Whatever we do to another, we do to ourselves,” not figuratively but literally.

Aren’t our beliefs, the way we think and act predicated on the way we perceive reality? Don’t most of us believe that we are individual, conscious entities that exist separate and apart from all other conscious entities? We see ourselves as our own self, independent from any other self, and so live and act according to that belief, don’t we?

But what if we could change our perception? What if we came to understand and really believe that we exist not separate and apart from one and other, but together and as part of a greater universal consciousness? Wouldn’t our thoughts and actions have to change?

Maybe that’s what separates Gandhi, King and Mother Teresa from the rest of us? Maybe they’ve paid the price and undergone the conversion of perception? Maybe the rest of us, and I include myself here, are just hanging out, waiting for someone else to do it for us?

Now I’m not saying we could all become the next Mother Teresa or Reverend King. No, that’s not going to happen. But, then again, we really don’t have to, do we? We really just need to focus on changing what we can. Namely, ourselves; our own perceptions, believes, thoughts and actions.

If we want to evolve, if we want to change, we have to make the effort, don’t we? And honestly, how many of us are making that effort? How else can you explain the repetitive cycle of cataclysmic stupidity that is human history?
Think about it. Isn’t evolution all about change? Isn’t it about taking the steps needed to progress and get better?

Maybe Professor Bostrom is right? Maybe the only way we can insure that the human race continues to evolve in a positive direction is by taking control of our own evolution? Maybe science will find the empathy or compassion gene, and figure out a way to turn it on in everybody? Maybe germ-line engineering will be used to deactivate the human ego, and create human beings that are genetically motivated to do what’s right instead of what’s in the best interest of the self?

Would that be good or bad? Would we be creating a singleton capable of enforcing The Golden Rule, or simply eliminating free-will?

I have no idea where evolution is going to take us, but I know that it’s happening a lot faster than any of us can possibly imagine.

Consider this, it took 13-years and over $300,000,000 for scientists to decode and map the 25,000 genes and 3-billion DNA subunits that make up the human genome. Today, you can decode and map your own genome in a little more than a week for less than $50,000. It took billions of years for human beings to evolve but now, science will be able to reverse engineer a human being by 2020.

The twenty-first century has literally brought us to the cross-roads of human evolution. Ready or not, technology is going to dramatically accelerate the evolution of the human race.

Is this a good thing, or a bad thing?

I don’t know. I think the technology itself is neutral. That is, it’s neither good nor bad. It’s the human being exercising free-will and functioning as the moral agent that determines whether the application of the technology is moral or immoral.
Evolution and Change

So, the real question might not be what are we going to evolve into, but what are the laws or truth that are going to guide us, and who gets to decide?
Antony Flew thinks for a living. He’s a philosopher, and a pretty good one at that. He’s taught at a number of prestigious colleges and universities, won some impressive awards, and publish over 50 major philosophical works. He’s done a lot of really serious thinking in his lifetime.

Antony was born on February 11, 1923, the son of a Methodist Minister. At the age of 15 it became evident that he had no intentions of going into the family business when he decided that he was an atheist. After touring Europe and witnessing the rising evil of Nazi Germany, he thought about it and concluded there was no such thing as a benevolent and loving God.

For the next 60-years Professor Flew was one of the world’s leading atheists. As a student at Oxford University he successfully debated C.S. Lewis on the existence of God. He published two books rationalizing the atheist position: *God and Philosophy* in 1966 and *The Presumption of Atheism* in 1984.

His philosophical approach has always been to follow the evidence wherever it leads. And that evidence led Antony Flew to conclude that there was no intelligence behind the universe and there was no God. Then in 2004 he did the unthinkable; he changed his mind.

The reaction within the believer and non-believer camps was naturally at the opposite ends of the spectrum. The believers welcomed the prodigal son back into the fold with open arms. The non-believers tried to dismiss him as a senile and scared old man. Professor Flew responded by writing along with Roy Varghese; *There is a God: How the world’s most notorious atheist changed his mind*.

In his book Professor Flew chronicles the evolution of his thoughts on the existence of God; from being the disinterested son of a preacher,
to his journey through atheism, to finally accepting the idea of a divine intelligence.

When the book hit the shelves in 2007 it launched another salvo of criticism from the atheists. They claimed that he was nothing but a shadow of his former self and was being manipulated by the religious right. Many of the criticisms were down right, nasty and mean. But Professor Flew seems to have been able to take it all in stride. In a number of interviews, he calmly and rationally maintains that he simply changed his mind.

He didn’t run off and join a cult, and he’s not been born again. He doesn’t believe in the Christian God or the God of Islam. In fact, he doesn’t subscribe to any particular religion, and he doesn’t believe in life after death. He is a deist. He asserts that he simply followed the evidence and concluded that the most rational explanation for the existence of the universe is some type of supreme intelligence, a chief architect, or God.

What happened between 1944 and 2004 to cause Professor Flew to change his mind? What new evidence emerged during this period that led him to conclude that there is some type of supreme intelligence behind the universe?

Well, the body of evidence has always consisted of the existence of both the universe and the human consciousness that is capable of perceiving it. What’s changed is the way we now understand and interpret reality as a result of the discoveries made by science.

Ok then, what are they? What’s the evidence? What do we know now, that we didn’t know 50 or 60-years ago?

We now have a theory or model to explain how the universe was created. In 1964 Arno Penzias and Robert Wilson, two Bell Laboratory
Think About It

A scientist working in Holmdel, New Jersey discovered the cosmic microwave radiation that more or less confirmed the Big Bang Theory.

We now know that we live in a universe that expanded into existence 13.7 billion years ago from a singularity; an infinitely dense point where gravity and space-time curves in on itself. It is from this singularity that the enormity that is our universe emerged.

Do we know where the singularity came from?

Well, no, but think about it. The singularity from which our universe emerged could not have existed within our space-time because our space-time didn’t exist prior to the big bang. Our space-time was created with the big bang. So, the singularity must have existed outside our universe.

Ok then, do we know of anything that exists outside our universe?

No, we don’t know of anything existing outside our universe because our observations are confined to and limited by our universe, but there are plenty of theories.

Our universe could simply be one of an infinite number of parallel universes. Our universe could reside on one cosmic membrane that’s part of a mega-universe. Our universe could have emerged from a singularity or quantum fluctuation in some other dimension.

So, what does this tell us?

Well, we know that you can’t get something from nothing. As long as something exists, there could never have been nothing, something has to precede something. Something has to have always existed. Either that something is the universe itself in some manner or form, or it’s God. Either the universe is its own first cause or God is.

However, we definitely know that there was a creation event and something that we can call a first cause. And that first cause either just
Think About It

happened, was simply some type of cosmic accident, or, there was some purposeful intent behind it. Those are the only two possibilities.

What else do we know about the Big Bang?

We know that everything that exists in the universe today was created in the first instant of the Big Bang as electro-magnetic radiation, or light. Everything, all the energy and matter in the universe, all the little subatomic particles that make up you and me, first emerged from the Big Bang as light.

Then within a very short time, like within $10^{-35}$ seconds, the light took on the property of mass and became quarks. No one knows how this happened, but these quarks began sticking together to form the protons, neutrons and electrons that 300,000 years later would form the first natural atoms. About a billion years after that, the galaxies, stars and planets started to form, and the rest as they say, is history.

Everything in the universe, at its most fundamental level is made of energy. That’s what Einstein taught us with his $E = mc^2$ equation. Again, no one is really quite sure how energy takes on mass and becomes matter, but it does.

If you think about it, this can occur in either one of two ways. The process by which the mass-less energy takes on the property of mass and becomes matter is either a natural phenomenon void of any purposeful intent, or it supposed to work that way. If it’s just a natural phenomenon that we currently just don’t understand it’s really no big deal. It is what it is, and maybe in time we’ll figure out how it happens. On the other hand, if it’s supposed to happen, then it’s part of some underlining universal design, a design that by definition denotes some type of designer.

But this is really just splitting hairs. How one chooses to interpret the phenomenon is really just a matter of either individual perception or
Think About It

prejudice. Regardless of how one chooses to split it, we can’t escape the fact that we are all children of the light.

What other evidence does the universe contain?

There are of course the fundamental laws of nature that are embedded into the fabric of the universe and the cosmological constants that keep everything together.

The fact that the universe even exists is by itself mind boggling. Our universe is so fine tuned, so precisely balanced that it in all probability should never have evolved. According to Roger Penrose’s calculations, the probability of the universe coming into existence is less than zero. It simply shouldn’t have happened.

So big deal, what does that tell us?

Well, again there are either two possible answers. The first possibility is that parallel universes or something like that really do exist. Our universe is just one out of an infinite number of universes. And given an infinite number of universes, it’s almost certain that one is going to arise with just the right conditions, and just the right physics to allow it to expand, evolve and exist. The second possibility of course, is that some intelligence authored those fundamental laws of nature, fixed those cosmological constants, and set it all in motion.

It’s either the infinite universe theory or God. Those are really the only two possibilities.

What about life? What evidence does life give us?

The origins of life in the universe remain a mystery. Obviously, we know that life exists in abundance because it’s all around us, but no one really knows where or how it started. Regardless, the fact that there is life tells us, that somewhere in the universe Abiogenesis occurred. Somewhere, at some point in time, non-living lifeless matter spontaneously became alive. That could have occurred here on earth, or
else where in the cosmos. It doesn’t really matter, but Abiogenesis must have happened.

In 1962 Francis Crick, James Watson and Maurice Wilkins were awarded the Noble Prize in Medicine "for their discoveries concerning the molecular structure of nucleic acids and its significance for information transfer in living material." They discovered the DNA molecule.

All living organisms; everything from a single cell amoeba to you and me are controlled by DNA. DNA is the instruction code that controls life; telling it what to eat, how to metabolize, how and when to reproduce, and even when to die.

When Abiogenesis first occurred, when ever and where ever that was, the amino acids and proteins that make up the DNA must have assembled in such a manner and in such a way as to write those instructions for life.

Again, there are two ways that this could have happened. Abiogenesis produced the first and only authorless book, or it is part of some deeper universal design. So it either just happened, or it was supposed to happen.

What else does life tell us?

We think that all life on earth evolved from a common ancestor that first appeared on the planet over 3 billion years ago. I say think because again, no one knows for sure, but that’s Darwin’s theory anyway. There are those whom claim that it’s a scientific fact, but it isn’t. It’s a theory.

The fossil record shows that for the first 3 billion years, life on earth remained pretty primitive; mostly singled cell life forms. Then about 550 million years ago the rate of evolution dramatically accelerated.
Think About It

During a 70 to 80 million year period known as the Cambrian Explosion, life became more complex and organized and apparently gave rise to “several of the main divisions of the animal kingdom” almost simultaneously. There is no unbroken fossil record linking the earliest forms of life on earth to all the different forms of life that exist today.

This may appear problematic for Darwin’s theory, and it is. Darwin himself was aware of it, but it doesn’t mean that Darwin is wrong. It doesn’t prove or disprove anything. All it means is that the evidence is incomplete, and that we really don’t know what happen.

In the end, it really doesn’t matter whether we emerged from a single common ancestor or whether multiple forms of life emerged independently. All that really matters is that we’re here, and either we just got lucky and it happened, or we’re supposed to be.

So all we know for sure is that no one really knows where we came from and how we got here? It’s all just speculation and theory?

Yeah, pretty much. But that by itself is the most amazing part of all.

Think about it. Somehow a universe that started off as light, expanded and evolved into something that could produce and sustain an intelligent life form capable of speculating and developing theories on where it came from and how it got here.

Sometimes I think we take that for granted. The fact that we exist at all sometimes gets over looked simply because we do exist. It didn’t have to happen. There is no reason at all why the universe should have given birth to life and why that life should have evolved into self aware, conscious beings, but it did. Why? Was it an accident or was it supposed to happen?

What is human consciousness anyway? Where does it come from and how does it fit into the puzzle?
Think About It

Much like the source of the universe and origins of life, human consciousness remains a mystery. Maybe it arises from some biochemical reaction inside the brain, or maybe it’s something that emerges when our neurons surpass some calculations per second threshold. Again, there are plenty of theories on what it is and where it comes from, but no one really knows.

But consciousness does exist, and it is our human consciousness that enables us to be self aware. And it is self awareness that drives us to seek the answers to these questions.

Think about it. You are the only person in all of creation that can say “I am me” and really know what you’re talking about. Only you are self aware of yourself. All of us can say it, but it means something different to each and every one of us. That’s what makes us so special and unique. We are self aware. And it’s self awareness that compels us to seek, question and explore. Because we are self aware we are driven to try to understand just who we are and where we come from. This is why human beings developed language and mathematics. These are the tools that we use to try to understand ourselves and our place in creation.

The science, philosophy and theology that we use to describe reality are all products of the human consciousness. And this consciousness either just emerged, or it is a part of, or was created by some higher universal consciousness.

What does science tell us about the true nature of our reality?

That’s difficult to say because the most accurate description of our universe comes from a quantum theory that paints a very non-materialistic picture of reality. Perhaps British Physicist and Mathematician Sir James Jeans put it best. When you begin to consider all the insights that modern science has given us, “The universe begins to look more like a great thought than a great machine.”
Think About It

Our reality and our universe appear to be more a product of mind rather than matter. As Nobel Prize recipient George Wald said: “Mind, rather than emerging as a late outgrowth in the evolution of life, has existed always as the matrix, the source and condition of physical reality, the stuff of which physical reality is composed is mind-stuff. It is mind that has composed the physical universe that breeds life, and so eventually evolves creatures that know and create.”

Our universe and everything in it; all the stars, and galaxies, all the subatomic particles, even you and me, could be nothing more than a thought; a bright idea that emerged as light from the Big Bang 13.7 billion years ago.

But whose idea is it? Is it an idea that simply popped into existence or is it the product of some intelligence? Is our existence simply a series of cosmic coincidences, or this there some purposeful intent behind it?

So no one really knows? I mean, there’s no proof – right?

There are plenty of people whom claim that they know, but they don’t. Science has theory and religion has dogma, but nobody has any proof.

The naturalists or atheists claim that they can provide an explanation for creation that doesn’t require the existence of a divine intelligence. That explanation of course, is evolution.

But again, evolution is only a theory. It may be a very good theory, but it’s an incomplete theory, with gaps in it that we need science to close. And that may happen. Science may continue to advance providing us the naturalistic evidence that we need to fill in the blanks, but it will only be able to take us so far.

Science may some day provide us the complete picture of what happened, but it is doubtful that it will ever be able to adequately answer
the how and why it happened, because science has a threshold that it may never be able to pass. It is the first $10^{43}$ seconds of the Big Bang or what is known as the Planck epoch. It is the point in creation where time was created. Given the limitations of our physics, any attempt to explain what came before, will undoubtedly never be anything more than speculation or theory.

That’s not to say that science may not be able to provide us some insight into the mind of the creator, if indeed there is one. But there will never be a complete and comprehensive naturalistic explanation for creation that will be able to disprove the existence of a divine intelligence.

Then there are the Creationists, who assert that some type of supreme intelligence or God is responsible for creating the universe. These range from the deist, like Antony Flew, who simply concluded that the natural order of the universe itself is evidence of a divine intelligence, to the religious, who subscribe to a specific set of beliefs, or dogma.

Creationists use sacred text and philosophical arguments to try to prove the existence of God. Some like the advocates of Intelligent Design have even developed their own quasi-scientific theories to counter those of the naturalists.

But regardless of the validity of their theories, or how sound their philosophical arguments are, or even how moving and mystical their sacred scripture may be, it does not in any way constitute the proof of God’s existence.

There is no proof that God exists. All the evidence that we have; whether it’s scientific or philosophical is at best circumstantial. There is no definitive, absolute, indisputable evidence that there is a divine
intelligence behind the universe. That’s why believing in God, has and always will be, a matter of faith. It is something that we choose to believe in, in the absence of proof.

The entire body of evidence, the enormity of the universe and the consciousness that perceives it, lies before each of us. And it is up to each of us, individually, to consider the evidence and draw our own conclusions. That’s what free-will is all about.

But here’s the question, how many of us actually do this?

Most of us inherit our belief system and don’t really give much thought to it. We’re not philosophers, theologians or scientists, we’re people; busy people, with jobs and families, with things to do and places we have to be. It would be nice to be able to sit back and contemplate the meaning of it all, but that’s not the reality we live in, is it?

I don’t know, is it?

My son Patrick is at that age where he’s developing an interest in cars. He especially likes James Bond’s Aston Martin and Bruce Wayne’s Lamborghini. What can I say, he’s a teenager!

Anyway, we were driving somewhere the other day and Patrick asked me, “Dad, if you could have any type of car in the world, what would it be?

I really didn’t give it much thought. “I don’t know. I like our minivan I guess.” “Are you kidding me!” he replied, “I’d get a Ferrari.”

Being the wet blanket that I am, I couldn’t leave it alone. “That doesn’t make much sense,” I said. “Why?” he asked. “Well a Ferrari is a precision engineered automobile designed to be taken out on the open road and driven at 90 or 100 miles per hour. We live on Cape Cod, and we don’t have any open roads. We spend our summers idling in bumper to bumper traffic. We’d never get a Ferrari out of second gear. And, the
winters and pot-holes around here would destroy it. It’s just not
designed to function like that.”

He wasn’t impressed with my logic and still wants a Ferrari. I
hope he’s not too disappointed.

The point I was trying to make with Patrick was that things are
designed to function a certain way, and if you don’t use them properly
you’re going to damage them. A Ferrari isn’t designed to cruse the main
streets and back roads of Barnstable County, carting the kids to soccer
and picking up the groceries.

Either by an accident of evolution or by the intent of a creator,
human beings are designed to think. We’re precision engineered animals
designed to explore, question and search. We function best when we are
out on the open road pushing the boundaries of human understanding.
We run the risk of damaging or destroying ourselves when we remain
complacent and idle.

But for some reason, it’s no longer fashionable to be
contemplative. It’s taboo. It’s no longer acceptable to talk about such
things as the purpose and meaning of creation and the possibility of a
divine intelligence. Bring it up at a party and you’ll find yourself
standing alone at the punchbowl. Mention it in a classroom and you’ll
find yourself in handcuffs.

Why, what happened?

Is it the fear that you may be stepping on someone’s toes that
keeps people from thinking and talking about such things, or is it the
separation of church and state thing? If discussing the idea that there
could be a divine intelligence behind the universe is advocating religion,
which religion is it advocating? Who knows, maybe it’s just a general
lack of interest?
Think About It

Why is going around and around asking yourself questions that have no answers so important anyway?

It’s important because they are the very questions that define the human being. They are the questions that change everything; the people that ask them and the world that embraces them. They’re the questions that give purpose and meaning to our existence and shape our perception of reality. And it’s the questions, more than the answers that drive our evolution. We ask ourselves those questions because it’s what we’re supposed to do. It’s what we’re designed to do.

If those questions are so important, then maybe we should leave it to the professionals to answer? You know, let the preachers, pontiffs, professors and politicians tell us what to believe?

Really, how’s that worked out for us so far?

Seriously! How well is the world doing? How much progress have we been making? Is everybody getting along? Is the world a safer, more peaceful and compassionate place than it was thirty years ago?

If you plotted out human history it would look like a roller-coaster. Not one of the new fangled metal coasters, with all the twists and loops, but an old fashioned rickety wooden roller-coaster.

The roller-coaster would extend out in a straight line for miles, just a continuous series of hills and valleys. The hills and valleys near the start of the ride would be relatively small, but would increase in size and steepness the further down the track you traveled. The peaks of the hills are those periods of peace and prosperity. The valleys are the periods in history marred by conflict and chaos. It’s a cycle the just continues to repeat itself.

The last valley we hit was the Second World War. The total death toll from that conflict, both civilian and military casualties, is estimated
Think About It

around 70 million people. After the war, the world enjoyed a period of peace and economic prosperity that lasted about 40-years.

Obviously, there were conflicts and wars, but they weren’t global conflicts. And the Cold War thank goodness, was, for the most part, a non-shooting war.

Sometime in the late 1980’s to mid 1990’s we crested the hill and started heading back down into the valley. But this time the hill is absolutely huge. The car in which we’re traveling is moving so fast that it’s almost out of control. We’ve picked up so much momentum and inertia that we’re in danger of crashing through the track. In other words, there may be no recovering from the next conflict which we are speeding towards.

The sad truth is that the world has never been a more dangerous place to live in then it is today. The population of the earth has never been at greater risk than it is right now.

In February 2003 a group of Australian scientists were working of developing a mouse contraceptive for pest control. They took the normally harmless mouse-pox virus and genetically altered it, so that it would simply make mice infertile. But it did a little more than that, it killed the mice. They had accidentally engineered a new killer virus.

This was an alarming wake-up call to governments across the globe. The genie was out of the bottle. If legitimate scientists trying to develop a mouse contraceptive could accidentally create a killer organism, imagine what terrorist could do?

Bio-terrorism is perhaps the greatest threat mankind has ever known. You don’t need enriched uranium and sophisticated delivery systems. All you need is a college biology lab, a little bit of knowledge, and the will to make something bad happen. And there are plenty of people in the world that have the resources, the knowledge, and the
Think About It

desire to make something bad happen. Individuals now have the power that was once limited to nation states.

The Commission on the Prevention of Weapons of Mass Destruction Proliferation and Terrorism; a Government Task Force headed up by Senators Bob Graham and Jim Talent, predicts that terrorists will use biological agents as a weapon of mass destruction somewhere in the world by the end of 2013. Think about this; mankind has yet to develop a weapon that it’s unwilling to use. In other words, if someone makes it, they’ll use it.

The saying “history” repeats itself has proven to be all too true. Whether we like to admit it or not, the history of the human race has been a continuous cycle of conflict and war.

Why is that? Why haven’t we been able to learn our lesson?

The times and technologies change, the countries and cultures involved in the conflicts change, even the ideologies and economics change, but the one constant denominator that never changes is human nature. And common sense dictates that, unless we can figure out some way to change that nature, the cycle of conflict is going to continue to repeat itself.

But how do you do that? How do you change human nature?

I don’t know! Maybe we’ll figure out a way to genetically re-engineer the species. Or maybe, science will provide us some new insight or understanding that will dramatically alter our perception of reality.

Think about it! What we believe and how we behave is, for the most part, based upon how we perceive reality. We perceive ourselves as autonomous conscious beings, independent and separate from all other conscious beings. Subsequently, we are consumed with the self. The self becomes its own singularity, the beginning and ending of everything.
And it is the singularity of self, which gives rise to a human ego that needs to enforce it’s will on others. It’s our perception, or perhaps more accurately, our misperception of reality that is the origin of all human conflict.

The science of the twentieth century has given us a totally new insight into reality, and the implications are staggering. What is beginning to emerge is a picture that’s vastly different than anything we previously thought possible. The universe no longer looks like Newton’s mechanical clock. The springs and inter-workings of determinism are giving way to the uncertainty of a quantumly entangled universal mind.

Where will the science of the twenty-first century take us? Will it finally yield us a Theory of Everything? Will that Theory of Everything include the existence of a universal intelligence? Who knows?

I don’t think that there will ever be any conclusive proof that there is a divine intelligence behind the universe. I don’t think the question of God’s existence is something that’s supposed to be either proved or disproved. I think that it’s supposed to remain the ultimate mystery which we must continue to investigate. And, in the end, I think it’s the questions more than the answers that are what’s important.

Either by accident or design, we all possess the innate capacity and desire to search for and know the truth. It’s evolution at work, the process by which we grow and change. The pursuit of the truth may or may not lead you to conclude that there is a divine intelligence behind the universe, but it will definitely change you because it’s the journey more than the destination that leads to conversion. Think about it; "Keep asking, and it will be given to you. Keep searching, and you will find. Keep knocking, and the door will be opened for you.”
# The Golden Rule

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<td>900 Million</td>
<td>Mahabharata 5.1517</td>
<td>This is the sum of the Dharma [duty]: do naught unto others which would cause you pain if done to you.</td>
</tr>
<tr>
<td>Confucianism &amp; Traditional Chinese Religion</td>
<td>394 Million</td>
<td>Analects 15:23</td>
<td>Surely it is the maxim of loving-kindness: Do not do to others what you would not have them do to you.&quot;</td>
</tr>
<tr>
<td>Buddhism</td>
<td>376 Million</td>
<td>Udana-Varga 5.18</td>
<td>Hurt not others in ways that you yourself would find hurtful.</td>
</tr>
<tr>
<td>Spiritism</td>
<td>50 Million</td>
<td>Chief Seattle</td>
<td>Humankind has not woven the web of life. We are but one thread within it. Whatever we do to the web, we do to ourselves. All things are bound together. All things connect.</td>
</tr>
<tr>
<td>Taoism</td>
<td>31 Million</td>
<td>Tai Shang kan Ying P’ien</td>
<td>Regard your neighbor's gain as your own gain and regard your neighbor's loss as your own loss.</td>
</tr>
<tr>
<td>Sikhism</td>
<td>23 Million</td>
<td>Guru Granth Sahib, pg. 1299; Guru Arjan Devji 259</td>
<td>Don't create enmity with anyone as God is within everyone.</td>
</tr>
<tr>
<td>Judaism</td>
<td>14 Million</td>
<td>Leviticus 19:18</td>
<td>Thou shalt not avenge, nor bear any grudge against the children of thy people, but thou shalt love thy neighbor as thyself: I am the LORD.</td>
</tr>
<tr>
<td>Baha’i Faith</td>
<td>7 Million</td>
<td>Baha’u’llah, Gleanings, LXVI:8</td>
<td>Lay not on any soul a load which ye would not wish to be laid upon you, and desire not for any one the things ye would not desire for yourselves. This is My best counsel unto you, did ye but observe it.</td>
</tr>
<tr>
<td>Janism</td>
<td>4.2 Million</td>
<td>Mahavira, Sutrakritamga</td>
<td>One should treat all creatures in the world as one would like to be treated.</td>
</tr>
<tr>
<td>Shintoism</td>
<td>4 Million</td>
<td>Udana-Varga 5.18</td>
<td>Hurt not others with that which pains yourself.</td>
</tr>
<tr>
<td>Unitarianism</td>
<td>1 Million</td>
<td>Unitarian principle</td>
<td>We affirm and promote respect for the interdependent web of all existence of which we are a part.</td>
</tr>
<tr>
<td>Scientology</td>
<td>500 Thousand</td>
<td>The Way to Happiness - L. Ron Hubbard</td>
<td>Try to treat others as you would want them to treat you</td>
</tr>
<tr>
<td>Zoroastrianism</td>
<td>250 Thousand</td>
<td>Shayast-na-Shayast 13.29</td>
<td>Do not do unto others whatever is injurious to yourself.</td>
</tr>
<tr>
<td><strong>5.4 Billion</strong></td>
<td></td>
<td></td>
<td><strong>Whatever you do to another, you do to yourself.</strong></td>
</tr>
</tbody>
</table>

81% of the world’s population subscribes to a religious belief that promotes the Golden Rule
Names & Faces

Jane Goodall
Anthropologist
1934 –

Environmentalist, humanitarian and author, her discovery that chimpanzees are tool-using primates was the catalyst in the redefinition of human beings.

Sir Roger Penrose
Physicist
1931 –

Noted for his work in mathematics, cosmology and quantum physics; he mathematically proved the existence of singularities, and contributed to the development of the theory of loop quantum gravity. He is an amateur philosopher and author working on theories connecting quantum physics and human consciousness.
Albert Einstein
Physicist
1879 – 1955

Developed the theories of General and Special Relativity. In 1921 he was awarded the Nobel Prize in Physics for "for his services to Theoretical Physics, and especially for his discovery of the law of the photoelectric effect," an important step in understanding the quantum nature of light and the wave-particle duality. He is considered the father of Modern Physics and the greatest scientist of the twentieth-century.

Niels Bohr
Physicist
1885 – 1962

Succeeded in working out and presenting a picture of the structure of the atom. He was awarded the Noble Prize in Physics in 1922 "for his services in the investigation of the structure of atoms and of the radiation emanating from them." A prolific writer, he authored 115 publications including: essays on physics and human knowledge.
Stephen Hawking
Physicist
1942 –

Noted for his contributions to quantum physics and cosmology; specifically his theories on singularities and black-holes. He is a gifted teacher and writer and authored the best selling science book of all time; A Brief History of Time.

Sir Martin Rees
Cosmologist and Astrophysicist
1942 –

Astronomer Royal and educator, noted for his work on cosmic microwave background radiation and quasars. He has authored over 500 research papers and been awarded the Michael Faraday Prize for "excellence in communicating science to UK audiences."
Names & Faces

**Sir Isaac Newton**  
Mathematician and Physicist  
1642 – 1727

A scientist, philosopher and theologian; He is consider one of the most influential people in human history. He laid the ground work for classical mechanics and along with Gottfried Leibniz developed differential and integral calculus. He is known for developing the laws of motion and gravity.

**Alexander Gurwitsch**  
Biologist and Medical Scientist  
1874 – 1954

Studied human embryology and cell development. In 1923 he discovered that living tissue emits ultra-weak biological photon or bio-photos.

**Professor Fritz-Albert Popp**  
Physicist  
1938 –

An educator and research scientist, his work has confirmed the existence of bio-photos. He is a founding member and Director of The International Institute of Biophysics.
Dr. Jacques Benveniste
Immunologist
1935 – 2004

A research scientist and pioneer in developing theories of digital biology.

Dr. J. Warren Robin
Medical Doctor and Research Scientist
1937 –

In 2005 was awarded the Noble Prize in Medicine along with Dr. Barry Marshall "for their discovery of the bacterium Helicobacter pylori and its role in gastritis and peptic ulcer disease."

Dr. Barry Marshall
Medical Doctor and Research Scientist
1951 –

In 2005 was awarded the Noble Prize in Medicine along with Dr. J. Warren Robin "for their discovery of the bacterium Helicobacter pylori and its role in gastritis and peptic ulcer disease."
Names & Faces

Professor Joseph T. Chang
Educator

Professor of statistics at Yale University and author of the research paper in Advance Applied Probability; “Most Recent Common Ancestor of all Present-Day Individual.”

Professor Donald Johanson
Paleoanthropologist
1943 -

Discovered the skeleton of the female hominid australopithecine known as "Lucy", in the Afar Triangle of Ethiopia in 1974. He is the founding Director of the Institute of Human Origins.

Stanley Kubrick
Motion Picture Director
1929 – 1999

An academy award winning motion picture writer, director and producer. His films include; Dr Strangelove, A Clockwork Orange and 2001; A Space Odyssey.
Names & Faces

Professor Richard P. Feynman
Physicist
1918 – 1988

Awarded the 1965 Nobel Prize in Physics along with Sin-Itiro Tomonaga and Julian Schwinger "for their fundamental work in quantum electrodynamics, with deep-ploughing consequences for the physics of elementary particles."

Dr. Stuart Hameroff
Physician
1947 –

An anesthesiologist, professor, researcher and author; he known for his scientific study and theories on human consciousness.

Professor Paola Zizzi
Theoretical Physicist

Noted for her work on loop quantum gravity, quantum computing and the “Big Wow” theory.
Charles Darwin
Naturalist
1809 - 1882

Naturalist and author of “Origins of the Species” in which he presented compelling evidence that all life evolved over time from a common ancestor through the process of natural selection.

Professor Richard Dawkins
Evolutionary Biologist
1941 -

Educator and author, noted for his gene centric view of evolution. An advocate of atheism and rationalism, he authored “The God Delusion” and “The Selfish Gene” among other works.

Professor Giacomo Rizzolatti
Neurophysiologist
1937 -

His research team discovered mirror neurons in macaque monkey. He has written numerous articles on the subject and is the past president of the European Brain and Behavior Society.
Names & Faces

Andrew Carnegie
Industrialist and Philanthropist
1835 - 1919

Founder of the Carnegie Steel
Corporation which later became U.S.
Steel. His philanthropy interest
included funding libraries, the Carnegie
Institute for International Peace and
Carnegie Mellon University.

Professor Samuel Oliner
Educator and Author
1930 -

Holocaust survivor and Founding
Director of the Altruistic Personality
and Pro-social Behavior Institute. He
has authored numerous publications on
altruism and ethics.

Professor Alison Gopnik
Researcher and Author

A professor of psychology, she is know
for her work on the theory of mind,
learning and cognitive development.
Susanne K. Langer
Philosopher and Author
1895 - 1985

Best know for her book “Philosophy in a New Key”, she taught philosophy and lectured at numerous American Colleges. She focused on art and its value to the human consciousness.

Professor Ronald C. Kessler
Educator and Author
1943 –

Professor of Health Care Policy at Harvard Medical School and member of the National Academy of Science.

Henry David Thoreau
Naturalist, Author and Poet
1817 – 1862

American author best know for his works, “Walden” and “Civil Disobedience.” He advocated simple living and the moral opposition to an unjust government.
Names & Faces

Oscar Pistorius
Athlete
1986 –

Double amputee and able body Olympic hopeful, he holds the world Paralympics Records in the 100, 200 and 400 meter sprints.

Professor Henry C. Harpending
Anthropologist
1944 –

Expert in population growth, divergence and gene flow. Member of the National Academy of Science and co-author of the book “The 10,000 Year Explosion.”

Professor John Hawks
Anthropologist

Associate Professor of Anthropology at the University of Wisconsin—Madison, examines the genetic and environmental causes that made the foundation of our origins.
Names & Faces

**Professor Nick Bostrom**  
Educator and Philosopher  
1973 -

Professor of Philosophy at Oxford University and Director of the Future of Humanity Institute.

**Mohandas Gandhi**  
Political and Spiritual Leader  
1869 - 1948

A political and spiritual leader he is considered the Father of the Indian Nation. He is most noted for his non-violent civil disobedience in championing the cause of Indian independence.

**Martin Luther King, Jr.**  
Civil Rights Activist  
1929 - 1968

A prominent leader in the American Civil Rights and Peace Movements. He was awarded the 1964 Noble Peace Prize and the Presidential Medal of Freedom.
Names & Faces

Mother Teresa
Humanitarian
1910 - 1997

A Roman Catholic Nun and founder of the Missionaries of Charity. She was awarded the 1979 Noble Peace Prize.

Professor Antony Flew
Philosopher and Author
1923 -

A philosopher, educator and author, he was considered one of the leading advocates of atheism until he changed his mind on the existence of a divine intelligence in 2004.

Arno Allan Penzias
Physicist
1933-

A physicist and scientist he was awarded the 1978 Noble Prize in Physics along with Robert Wilson "for their discovery of cosmic microwave background radiation."
Robert Woodrow Wilson
Astronomer
1936 -

An astronomer and scientist he was awarded the 1978 Noble Prize in Physics along with Arno Penzais "for their discovery of cosmic microwave background radiation."

Francis Crick
Molecular Biologist
1916 - 2004

A molecular biologist, physicist and neuroscientist, he was awarded the 1962 Noble Prize in Medicine along with James Watson and Maurice Wilkins "for their discoveries concerning the molecular structure of nucleic acids and its significance for information transfer in living material."
Names & Faces

**James D. Watson**  
Molecular Biologist  
1928 -

A molecular biologist, he was awarded the 1962 Noble Prize in Medicine along with Francis Crick and Maurice Wilkins "for their discoveries concerning the molecular structure of nucleic acids and its significance for information transfer in living material."

**Maurice Wilkins**  
Molecular Biologist  
1916 - 2004

A molecular biologist, he was awarded the 1962 Noble Prize in Medicine along with Francis Crick and James Watson "for their discoveries concerning the molecular structure of nucleic acids and its significance for information transfer in living material."

**Sir James Jeans**  
Mathematician and Physicist  
1877 - 1946

Professor of physics at Cambridge and Princeton he made numerous contributions to quantum theory and stellar evolution.
Names & Faces

George Wald
Scientist
1906 - 1997

Most noted for his work on retina pigmentation, he was awarded the 1967 Nobel Prize in Medicine along with Ragnar Granit and Halden Hartline for their discoveries concerning the primary physiological and chemical visual processes in the eye.

Bob Graham
United States Senator
1936 -

A former Governor of Florida and U.S Senator, he serves as the Chairman of the Commission of the Prevention of Weapons of Mass Destruction Proliferation and Terrorism.

Jim Talent
United States Senator
1956 -

A former U.S Senator from Missouri, he serves as the Vice-Chairman of the Commission of the Prevention of Weapons of Mass Destruction Proliferation and Terrorism.
The references that I include here are just a partial list. Over the years there have been numerous books, journals, newspaper articles and web-sites that I have read, and from which I have learnt things. I apologize to anyone whom I have omitted or overlooked.


References


References


References


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Maurice Wilkins Biography: http://nobelprize.org
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