

God, The Observer/Creator of our Entangled Universe

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First Presented at Iowa College SRICF September 26, 2009

So God created man in his own image, in the image of God created he him; male and female created he them.

Genesis 1:27

Cogito ergo sum.

Rene' Descartes

WHAT ARE WE, WHERE ARE WE, AND HOW THE HECK DID WE GET HERE?

Man is a wondering animal. Your ancestors and mine, long before they ever considered building structures beyond the rude caves in which they sheltered, far longer before they designed and built the great edifices that glorified the Old World, stared into the vastness of the heavens and wondered. What am I? Why am I here? How did I get here? What is "here"? What is real? What is true? And to answer those questions, and those asked by their inquisitive offspring, they developed "creation stories". Whether divinely inspired, or the products of fertile imaginations, these explanations provided answers. They even satisfied some of the questioners.

But man is also an impatient, inquisitive, stubborn animal, and an extremely intelligent animal. Despite the plethora of "official" answers provided by priests, shamans, or holy men, some were unsatisfied, and demanded further explanations. Just as the insistent and never-ending litany of "But why, Daddy, why?" springs from the mouths of modern children, so came the chorus of likeminded questions from the skeptics.

Philosophers such as Aristotle and Plato attacked the questions with a purely mental approach. They asked hypothetical questions, and created working solutions. Some of those answers were based on something beyond what we could see in the world around us. Plato made it clear that the mathematical propositions—the things that could be regarded as unassailably true—referred not to actual

physical objects (like the approximate squares, triangles, circles, spheres, and cubes that might be constructed from marks in the sand) but to certain idealized entities. He envisaged that these ideal entities inhabited a different world, distinct from the physical world. Today we might refer to this world as the Platonic world of mathematical forms.¹ And thus, mathematics came into play as the basis of reality. Not long after that, at least not long in cosmological terms, Galileo (with help from Kepler) set the world on its ear.

The earliest tool used to explore reality was observation. A person felt a flame and observed that it was hot. He dropped a stone and observed that it always fell to the ground. He looked at the sun, and clearly saw that it moved around the earth. Likewise, the moon and stars clearly moved around the earth, although a few of those stars wandered in a strange fashion. Those wanderers created awe and wonder in the observers.

Galileo did not invent the telescope. But he did use it to look at the moon and the stars, especially those wandering stars. He discovered some startling things about them. They were much different than the fixed stars. They were more than mere pinpricks of light. In fact, some of them seemed to have other small bodies that moved around them, just like the moon moved around the earth. This led to a truly heretical notion, the heliocentric nature of our solar system, which, in turn, led directly to a confrontation with the Inquisition. But he knew it was true. Legend has it that while publicly recanting his views, he still exclaimed, "And yet it moves!"²

Following Plato's lead, Galileo advanced and promoted the idea that reality was based on mathematical ideals. In *The Assayer* he wrote "Philosophy is written in this grand book, the universe ... It is written in the language of mathematics, and its characters are triangles, circles, and other geometric figures."³

THE SCIENTIFIC PRINCIPLE

Galileo did more than merely observe the universe. He also experimented with how things worked. While dropping differently weighted balls off the Leaning Tower of Pisa is probably a fable⁴, he actually did many other experiments. He was, perhaps, the father of

the modern scientific method. But still, his accomplishments pale beside those of another giant. This man was not the first scientist; he was not the first great mathematician, but he was, arguably, the greatest of both. He was Isaac Newton. Newton combined mathematics and experimentation to first observe, then predict, and finally verify. But he also claimed it all was initially derived and created by God.

By the end of the 17th century, instead of looking through the symbols to “the God beyond God,” Christians were transforming it into hard fact. Sir Isaac Newton had claimed that his cosmic system proved beyond doubt the existence of an intelligent, omniscient, and omnipotent creator, who was obviously “very well skilled in Mechanics and Geometry.”⁵

In his great treatise, the *Principia*, he writes:

... the ancients ... made great account of the science of mechanics in the investigation of natural things; and the moderns, lying aside substantial forms and occult qualities, have endeavoured to subject the phænomena of nature to the laws of mathematics, I have in this treatise cultivated mathematics so far as it regards philosophy... I am induced by many reasons to suspect that they may all depend upon certain forces by which the particles of bodies ...are either mutually impelled towards each other, and cohere in regular figures, or are repelled and recede from each other; ... I hope the principles here laid down will afford some light either to this or some truer method of philosophy.⁶

And through Newton’s Law of Gravity, the exploration of the universe really began. That exploration was fitful, full of blind alleys and seemingly final solutions. As recently as 100 years ago, the known universe consisted of one galaxy, our own Milky Way. But cosmologists built better telescopes and discovered that some fuzzy stars were actually enormous collections of stars, each containing several billion stars similar to our own. They learned that the universe was enormous, and expanding at an unbelievable speed.

While the cosmologists were busy exploring the vast expanses of space, the physicists were busy going in the other direction, probing

into the very workings of “the small stuff”. They discovered that matter was made up of atoms. They discovered that atoms were made up of protons and electrons and neutrons. They discovered that protons and neutrons were made up of even stranger things called quarks. And they discovered that quarks came in several different “flavors” and “colors”. And about the time the physicists reached the limits in the power of their experimental apparatus, they learned that the cosmologists had at hand what was perhaps the most powerful experimental apparatus anywhere, the universe itself. And through a combination of both sciences, with a healthy dose of mathematics mixed in, they began working backwards in time, toward a time when the universe was much smaller, so small that, perhaps, it didn’t exist at all.

THE ORIGIN OF THE UNIVERSE (AND US)

Most physicists will tell you that the cosmos began about 14 billion years ago in a “big bang”. Their mathematics and formulas become more approximate and vague as they push back to the magic moment. But they have reasonable confidence in what was present just a very few moments, a few millionths of a second, after the big bang. At that time, it was a hot, formless soup of very elementary particles, quarks and leptons. As it expanded and cooled, layer on layer of structure developed: neutrons and protons, atomic nuclei, atoms, stars, galaxies, clusters of galaxies, and finally super clusters. The observable part of the universe is now inhabited by 100 billion galaxies, each containing 100 billion stars. Galaxies are held together by the gravity of mysterious dark matter. The universe continues to expand and indeed does so at an accelerating pace, driven by dark energy.⁷

THE GOLDBLOCKS PROBLEM

But as the universe expanded and cooled, its very properties changed. Physicists will tell you that there are four kinds of forces: electromagnetic, weak, strong, and gravitational. Electromagnetic forces are what hold our parts together. They are what make magnets work; they allow electrical generators and computers and radios to work. The weak and strong forces work on atomic scales and hold the truly tiny pieces together, and in some cases, apart. And

gravity, the weakest of all the forces, works over the longest distances, holding planets in their orbits, stars in their galaxies, and us on the earth. These are distinct forces, with incredibly different strengths and vastly different distances over which they work. Yet the formulas that define their operation hint that they may actually be different forms of a single force. Scientists have shown that at a high enough temperature, the electromagnetic and the weak forces are actually one and the same. There are strong indications that at higher temperatures still, they may be identical to the strong force. And many theorists insist that there are hints that gravity, the oddball in the bunch, can be combined with the other three in a "Grand Unified Theory" or a "Theory of Everything".

But all is not well in this Grand Theory. Because the theory also suggests that there is nothing magical about the way those forces diverged. They could have formed differently, creating a very different type of cosmos. And very subtle changes in how those four forces interact make a huge difference. In some cases, changes of just a small fraction of one percent in the ratio of strengths between two of the forces would have made our universe uninhabitable, for a variety of reasons.

On the face of it, the universe does look as if it has been designed by an intelligent creator expressly for the purpose of spawning sentient beings. Like the porridge in the tale of Goldilocks and the Three Bears, the universe seems to be "just right" for life, in many intriguing ways. No scientific explanation for the universe can be deemed complete unless it accounts for this appearance of judicious design.⁸ So how did it all work out so well?

Of course, the straightforward adoption and acceptance of a creator with intelligence and power beyond all understanding, a being who made things "just perfect", is one way out of the quandary. But remember, we humans are wondering animals. We want to know Why. And How. And Who. So, being humans ourselves, let us, just this once, go down a very different path, like Alice down the rabbit hole, just to see where it may lead. But first, we need to discuss the quantum.

QUANTUM THEORY

As physicists probed in to smaller and smaller domains, they found that things didn't work in a natural or logical fashion. For example, they discovered that light suffers from a serious identity crisis. Unlike Popeye, who claims, "I yam what I yam and that's all what I yam", these particles more closely resemble Dr. Jekyll and Mr. Hyde. They exist both as a wave and as a particle. Not one or the other, but both at the same time. And their behavior depends on how you look at them, how they are observed. If you shine a weak light on an appropriate detector, the detector will detect individual particles of light. If you shine it through a lens or a diffraction grating, it bends or interferes with itself just like any other wave.

This behavior is not limited to light or photons. An electron, clearly a particle of matter since it is a constituent part of an atom, also behaves like a wave, when measured or observed appropriately. After a whole lot of head scratching, physicists determined that everything behaves like both a particle and a wave. A photon does; an electron does; a baseball does; even the earth itself can act like either a wave or a particle, like an ethereal nothingness or like a very material something. It all depends on how they are observed.

So if an electron is both a wave and a particle, where is it? Well, perhaps it really isn't anywhere. The mathematics and the physics allow us to write an equation only for the probability of its being in any particular location. They don't tell us it will be there; they just say that when we look for it, it will be in one of an infinite number of locations, with some given probability of being in any one of them. Quantum theory tells us that an unobserved small object exists only in a blurry, unpredictable state, with no well-defined location or motion until the moment it is observed. Physicists describe the phantom, not-yet-manifested condition as a wave function, a mathematical expression, a kind of equation. When the property of an electron suddenly switches from possibility to reality, physicists say its wave function has collapsed. What accomplishes this collapse? Messing with it. Hitting it with a bit of light in order to take its picture. Just looking at it does the job.⁹

You may have heard of Schrödinger's cat. This is not just any cat. It is a hypothetical cat in a hypothetical experimental box. The box also

contains a hypothetical bowl of food. But the food is only made available to the cat if a photon or an electron or some wave/particle “thing” goes into a small hole in the box and hits a detector. The experiment is set up so the photon can go either into the hole in the box or into another box without a cat. There is a certain probability that it can take either path. Once the photon is sent, we have no way of knowing which box it went into without opening the boxes to look. We have no way of knowing whether the cat is starving to death or happily eating and getting fat until we open the box. The fate of the cat is entangled with the fate of the photon.

The concept of entanglement is unbelievably complicated, but the summary of it is that the state or location of the photon becomes mysteriously combined, or entangled, with the state of the cat. There is a probability that the photon went into the box and the cat is alive; there is another probability that the photon did not go into the box and the cat has starved. The cat is in a superposition of states, both alive and dead. Only when we open the box to observe the cat is the state of the cat determined. It matters not if we open the box today, or next week, or next year. The cat is both alive and dead until we open the box. At that point, the probabilistic function collapses, or becomes determined. The cat becomes either dead or alive. Prior to our observation, the cat is both dead and alive. (*Interestingly enough, looking into the other box to see if the photon went in there will also do the job. But you have to look.*)

While this specific experiment cannot really be performed, there are other, equally confounding experiments that demonstrate the same principle. In these experiments, the measurement of one of two entangled items instantly determines the state of the other entangled item, even if the two items are light years apart. Einstein had particular difficulty with this principle. He called it “spooky action at a distance” and claimed that it proved the fallacy of quantum theory. And yet, recent experiments have demonstrated that it really does behave the way the equations say that it will. Until one part of an entangled system is observed, the entire system is in a superposition of states, neither here nor there, neither true nor false. But once any part of it is observed, the entire wave function collapses and becomes reality.

What is truly unbelievable about this entire structure, is that it appears as if the observation must be made by a conscious intelligence, not some isolated detector or camera. If you find this hard to believe, you are not alone. If you find the conclusions impossible to believe, you are not alone. Einstein never accepted it. Even Niels Bohr said, “Anyone who is not shocked by quantum theory has not understood it.”¹⁰

OBSERVER/CREATORS

So now, let us take that giant leap into Alice’s rabbit hole. Let us remove ourselves from the weird, but apparently true, and launch ourselves into the truly speculative and probably wrong. Let us consider the early state of the cosmos, right at the moment of the big bang. There are no observers to observe its state. There are no observations to collapse its wave function. It is an enormously small, yet enormously complicated entangled conglomeration of possibilities. It grows immense, but remains entangled. It must remain entangled, since there are no observers. The possibilities and probabilities increase at an exponential rate. One possibility is that the cosmos expands in a specific way at a specific rate. Potentially some particular particles form and group together one way or another. They don’t necessarily do that; they don’t actually do that. There is just a probability that that is what they have done. There is a particular probability that the four forces we know become defined in the way that we know them to have done. But there is a vastly larger probability that they became defined in a totally different way. The entangled wave function increases in complexity, leading to an infinite number of possibilities, of different universes, some with stars, some without, some with galaxies, some without, some with an earth and sun as we know them, many more without.

Just as Schrödinger’s cat is seemingly in a state of “suspended animation” in the absence of an observation, so the quantum universe as a whole remains suspended in a superposition of vastly many “histories”¹¹

Remember, these are not realities; they are not alternate universes; they are nothing more than possible states of an infinitely complex wave function. But at some point, one of the possible states, one

with an infinitely small, but non-zero, probability, includes a conscious intelligence, perhaps one of your ancestors and mine, with sufficient ability to perform an observation. This conscious intelligence, our ancestor, observes the light, and sees that it is good. And in a single instant, the entire probabilistic wave function of the entire cosmos collapses into our reality.

In the beginning God created the heaven and the earth. And the earth was without form, and void; and darkness was upon the face of the deep. And the Spirit of God moved upon the face of the waters. And God said, Let there be light: and there was light. And God saw the light, that it was good, and God divided the light from the darkness. And God called the light Day, and the darkness he called Night. And the evening and the morning were the first day.¹²

It may have happened a million years ago. It may have happened when Moses observed a burning bush. It may have happened when Galileo peered into the heavens with his telescope. It may have happened when Newton described gravity. It may have happened last week when I started to write this paper. It took but an instant. And though it must have happened only yesterday in cosmological terms, it instantly created a 14 billion year history for us to own and share. And since that one solution to the wave function included an intelligent observer, by definition it included the proper relationship of forces and the correct sequence of events to make our universe “just right for life”, just right for us.

Perhaps the entire wave function did not collapse all at once. Perhaps only a portion collapsed, just that portion that was required to allow the existence of that specific observer. But then the descendents of that first observer continued to observe, to poke into the unknown, to use telescopes and microscopes and mass spectrometers and radio detectors. As more and more was observed, more and more of the wave function collapsed. And behold, the observers became the creators. The created became the creators. God created man in his own image. But God was man and man was God. And man created his world and himself, pulling himself up by his own bootstraps. And every conscious human being continues to tug on those bootstraps today, unknowingly participating in the greatest activity of all time, the creation of our universe.

If so, Rene Descartes was on the right track when he said, “Cogito ergo sum.” (I think, therefore I am.) But perhaps his comments should be slightly modified to reflect this new possibility, “Specto, ergo sum.” (I observe, therefore I exist.)

IMPLICATIONS ON NATURAL LAW

If this is the way it all sorted out, what are the implications regarding our responsibilities to ourselves, to our country, to our God? If we are God, to whom do we owe allegiance? And does believing in evolution and all this quantum mechanics probability driven reality make one an atheist?

“Can we respond religiously to evolutionary theory? Can we use it to recover a more authentic notion of God? Darwin made it clear ... [that] we cannot regard God simply as a divine personality, who single handedly created the world.”¹³

Perhaps these are questions better answered by Masons than by theologians or physicists. After all, Freemasonry is a “speculative” science, and this is definitely a speculative question. In his wonderful book, *The Builders*, Joseph Fort Newton compared Masons to other scientists.

Masonry is “a science which is engaged in the search after divine truth;” but that is vague, indefinite, and unsatisfactory, lacking any sense of the uniqueness of the Order, and as applicable to one science as to another. For surely all science, of whatever kind, is a search after divine truth, and a physical fact ... is as sacred as a moral truth—every fact being the presence of god.¹⁴

And he certainly espouses the concept that mankind contains a spark of divinity.

Here lies the great secret of Masonry—that it makes a man aware of that divinity within him, wherefrom his whole life takes its beauty and meaning, and inspires him to follow and obey it.¹⁵

In *The Mysterious Stranger*, Mark Twain introduces Satan to a group of young men. During the course of the adventure, Satan creates a large number of small people, who work to build a castle. But what he created, that he destroyed.

“Satan ...crushed the life out of them with his fingers, threw them away, wiped the red from his fingers on his handkerchief, and went on talking where he had left off: ‘We cannot do wrong; neither have we any disposition to do it, for we do not know what it is.’”¹⁶

But in the end, Satan denies that God exists. He denies that anything exists.

“It is true, that which I have revealed to you; there is no God, no universe, no human race, no earthly life, no heaven, no hell. It is all a dream—a grotesque and foolish dream. Nothing exists but you. And you are but a thought—a vagrant thought, a useless thought, a homeless thought, wandering forlorn among the empty eternities.”¹⁷

Our fraternity teaches a vastly different truth. It teaches us that there is a right and a wrong. It teaches us that we have responsibilities to others. It teaches us to help, aid, and assist our brethren and our fellowman. It teaches us to not cheat, wrong, or defraud our brethren or our fellowman. It teaches us to do these things, not because we will suffer the immediate retribution of an angry God, or necessarily to ensure our happiness in an eternal life, but rather because they are the right things to do. They represent our duty to ourselves, to our country, and to our God, whatever form he may take.

Newton also tells us to behave appropriately. “That is to say, man is a being who, if not actually immortal, is called by the very law and necessity of his being to live as if he were immortal.”¹⁸ And he quotes Albert Pike, “A man who has a higher conception of God than those about him, and who denies that their conception is God, is very likely to be called an Atheist by men who are really far less believers in God than he.”¹⁹

Newton had no knowledge of quantum mechanics. He lived prior to its discovery. He was not a physicist. He was a minister. But he understood the importance of consciousness and conscience.

In short, that the first and last thing in the universe is mind, that the highest and deepest thing is conscience, and that the final reality is the absoluteness of love. Higher than that faith cannot fly; deeper than that thoughts cannot dig.²⁰

And in the final analysis, he understood that all philosophy, all religion, and all sense of right, is the domain of mankind.

Since mysticism is native to the soul of man and the common experience of all who rise above the animal, it is not an exclusive possession of any set of adepts to be held as a secret. Any man who bows in prayer, or lifts his thought heavenward, is an initiate into the eternal mysticism which is the strength and solace of human life.²¹

So Mote It Be.

Notes

- ¹ Penrose, Roger. The Road to Reality, page 11
- ² Wikipedia article on Galileo
- ³ Ibid.
- ⁴ Ibid
- ⁵ Armstrong, Karen. *Man vs. God*. The Wall Street Journal, September 12-13, 2009
- ⁶ Newton, Isaac. The Principia, Preface to the First Edition
- ⁷ Turner, Michael, *Origin of the Universe*, Scientific American, September 2009
- ⁸ Davies, Paul, Cosmic Jackpot, Why Our Universe is Just Right For Life, Houghton Mifflin, 2007, Kindle edition, location 112-15
- ⁹ Lanza, Robert and Berman, Bob. *The Biocentric Universe*, Discover. May 2009
- ¹⁰ Susskind, Leonard. The Black Hole War, Little, Brown and Company 2008, page 83
- ¹¹ Davies, location 3914-16
- ¹² Genesis I: 1-5
- ¹³ Armstrong, Karen. *Man vs. God*.
- ¹⁴ Newton, Joseph Fort. The Builders, A Story and Study of Masonry, The Torch Press 1915. page 240
- ¹⁵ Ibid, page 293
- ¹⁶ Twain, Mark. The Mysterious Stranger
- ¹⁷ Ibid
- ¹⁸ Newton. The Builders, page 270
- ¹⁹ Pike, Albert. Morals and Dogma, page 643
- ²⁰ Newton. The Builders, page 267
- ²¹ Ibid, page 190

Bibliography and Suggested Reading

Of a necessity, this paper provides a most cursory introduction to the concept of an observer/creator. The treatment of quantum theory and entanglement is presented in something less than an elementary fashion. Books could be written on these topics. In fact, they have been. For those interested, the following are recommended reading.

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