

Your Place in the Universe
Unitarian Universalist Society of Schenectady
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Bill MacTiernan, Resident Know-It-All

The teal hymnal contains the best and it contains the worst. The best, we sang it: “Blue Boat Home.” The worst: number 1003: “Where Do We Come From.” Listen to these words:

“Where do we come from? What are we? Where are we going? Mystery, mystery...”

Well, everything is not just a big mystery. This might have been true 150 years ago but it is not true today. Times have changed! We are no longer ignorant. We know where we came from and we know what we are. Just ask Mr. Darwin. And, and we know where we, as individuals, are going. We just don't like to admit it to ourselves.

But I'm getting ahead of myself. So, let's back up a bit and review some history, the history of thought about the universe: How it got to be and how we fit in, or not. Here is the Genesis story. It is a fairly standard stone-age/bronze-age description of reality: The earth is flat

- There is a dome over it
- The sun, the moon and the stars circle the earth
- The size of the land is 1000 miles at best
- The oceans or water surround the land
- The length of time reality has existed is measured by counting back some small number of human generations

There were, at that time, some people who knew that the earth was a sphere - the smarter mathematicians and the navigators. But not the people who wrote the Holy Books.

Around 1500, it generally came to be acknowledged that the earth was a sphere. This caused some consternation; it was counter-intuitive. “Up” ain't up and “down” was no longer down. But the earth remained the center of reality.

In the early 1600's, Galileo, the Italian astronomer, spent his last few years under house arrest and under threat of torture and execution, for defending “heliocentrism,” the assertion that the sun was the center of reality. His contemporary, Copernicus, also a heliocentrist, had the good sense to put off the publication of his book on the subject until after Copernicus', death. Nevertheless, here we are, living in a heliocentric solar system, with the planets, including the one on which we live, orbiting the sun.

Well, that was the 1600's, but it wasn't until 1838, when a German astronomer, Fredrick Bessel, was able to measure the distance to the stars and calculate their true brightness, that it became apparent that the sun was actually just a very ordinary star. Think about it! It was only in the mid-19th century that the size of reality went from being the solar system to being the entire “Milky Way” galaxy.

But, that description of the size of reality did not last as long as any of the others. By the mid-1920s, Edwin Hubble, an American astronomer, demonstrated that all those hazy stars at the edge of the galaxy, the so-called nebulae, were in fact other galaxies existing at enormous distance from our own. And, wonder of wonders, all of the galaxies were moving away from each other, moving away at increasing speed.

A reality the size of the galaxy was suddenly dwarfed and the concept of a steady-state reality was also “out the window.” If reality was expanding then it must have had a beginning, a “Big Bang” so to speak (thank you very much Mr. Alpher) and it also will have, as of necessity, an ending. Actually, “Big Bang” is not a good descriptive title. What it really should have been called is the “Evolution of the Universe.”

A brief footnote here: At about the same time Mr. Hubble was expanding the universe beyond our galaxy, scientists started talking about reality in a different way. They started to call it the “space/time continuum,” recognizing that time is not independent of motion.

So, is the current scientific description of reality correct? It’s not a story like the genesis story. It’s not made up. It is a description based upon evidence; a description which has been tested over and over and over again. Science does provide truth as best as truth can be known.

- Water is two parts hydrogen and one part oxygen
- The earth is a sphere with a circumference of about 25,000 miles
- The earth is a planet orbiting an ordinary star in the Milky Way galaxy
- The Milky Way galaxy contains some 200 billion stars similar to the sun

All of these statements have been tested and essentially proven over and over again. They are facts, or as close to facts as humans can get.

By the way, “evolution” is not a story either. The “Theory of Evolution by Natural Selection” is the scientific explanation for the complexity of life on the planet earth. It has been tested and proven over and over again, and has been observed in laboratory experiments actually occurring. The “theory of evolution” is about as certain as is the “theory of a heliocentric solar system.”

So here is what we know -- here is what science tells us about the reality in which we live:

- How big is the solar system? Neptune, the outermost planet orbits the sun at a distance of 3.2 billion miles.
- The Milky Way galaxy is 100,000 light years in diameter and 1000 light years thick.
- The observable universe contains 100 billion galaxies, that’s 300 sextillion (3×10^{23}) stars.
- The radius of the universe is 46 billion light years.
- The universe has been around for almost 14 billion years.

Also, everything that I have previously described, all the stars and all the planets in all the galaxies and all the dust and gas in between is only 5% of what makes up the universe. What’s the rest? “Dark Matter” and “Dark Energy.” How do we know that these exist? Dark matter accounts for the gravity of the universe and dark energy explains the acceleration of the expansion of the universe; ultimately to a state of high entropy and cold uniformity.

We recognize that we humans are creatures of the 5%. Dark matter and dark energy do not interact in any measurable way with the atoms and molecules that make up human beings or the reality that we inhabit. By the way, the millions of neutrinos that pass through our bodies every second also do not affect the atoms and molecules of the human world.

The surface of the earth is teeming with life, but is the universe teeming with life? No, it is definitely not! Space, by virtue of its temperature, a few degrees above absolute zero, and ever-present radiation is inimical to life. Life needs an atmosphere, water and an energy source. This means that for life to originate and thrive, the requirement is for a planet with the right chemical makeup and in the right proximity to a star. The planet needs to be in what has come to be called the “Goldilocks” zone.

There was recent excitement in the scientific community. A planet in the “goldilocks” zone was found to be orbiting the very star which is nearest to our solar system. Our next door neighbor so to speak. Unfortunately, that planet has an 11 day year and no rotation, so habitation by some single cell life is unlikely. Our nearest neighbor, that star and its planet, is four light years away. That’s 25 trillion miles -- 25 trillion miles away!

So here we are on this speck of dust that we call “earth,” trying to figure out whether conditions are right for the formation of self-replicating molecules on another speck of dust 25 trillion miles away. There is no consciousness in between here and there. Everything in between is devoid of life. Now bear in mind also that humans are looking for planets where life on a microbial level is possible. The earth is such a planet and life on earth has been around for 3.5 billion years. For the first three billion of those years, it was single cell life. It is only in the last 500 million years (give or take) that multi-cell creatures have existed. Human beings capable of describing reality in linguistic terms have been here for only (say) 200,000 years and technologically competent humans, only in the last 100 years or so.

How long will “technologically competent” humans be around? Such competence, such intelligence is not the goal of evolution. Evolution has no goals. Technological competence may only be a freak outcome and we have yet to see whether it will provide long term success for our species. You live your incredibly short life in this cold dead universe, on a little speck of dust, orbiting a very ordinary star, which will, in cosmological time, soon burn out. Are you depressed?

Well, here’s another question: Is the universe, the reality in which we live, monistic or dualistic? Does a spirit world which causes life or interacts with life pervade the universe like dark energy? Obviously the answer is no! Because life exists only upon this speck of dust that we inhabit. There may be other specks of dust, in other galaxies perhaps, where animate creatures exist, trillions upon trillion of miles away, but for all intents and purposes it is fair to say that the earth is it for intelligent life.

The universe clearly does not coexist with a spirit reality, so let’s restrict the question to the planet earth. A crude, but rather accurate way to ask the question is: Is there a spook in the machine? The science of evolution says that all life came from the same source some 3.5 billion years ago. Life does not continue to arise. Since there is a continuum, there is nothing to differentiate one twig from another on the tree of life. If human beings have a “ghost” or a “soul” inside of us, then what about Neanderthals or Denisovans? What about the great apes and dogs and snakes and worms and bacteria and viruses? Where is bacteria heaven and how many bacteria are in it? To say that humans are qualitatively different from other life is to deny the fact of evolution and science itself.

Science tells us that, above the quantum level, we live in a deterministic reality. The interactions of the particles that make us up, the electrons, the protons and neutrons and the forces that act upon these particles, electromagnetism, the strong and weak nuclear forces and gravity, are all known and all interactions ever observed are in accord with the laws of physics. Now, if our brains and nervous systems, which are made up only of the three types of particles acted upon by the four forces, were to be subject to influence by a non-physical realm, then such influence would show up as a violation of the laws of physics. No such violation of the laws of physics has ever been observed. If it did occur it would be a miracle in the truest sense and prayer would have to replace physics as the best predictive method.

If there is no reality other than the physical reality, of which we are a part, then certain conclusions follow as of necessity: All human understanding is simply a construct in individual human brains. There is no independent world of forms or mathematics. Math and logic are simply aids to prediction by individual humans. There is no philosophy. Why, because “natural philosophy” has been replaced by science and, beyond that, there are no objective standards. In short: “Is” cannot be translated into “Ought.” There is no religious truth. All of religions explanatory functions have been replaced by science and its control functions (prayer and supplication) have been demonstrated to be non-existent. Whatever else remains of religion and philosophy has been replaced by psychology.

If we live in a physical reality, then information must be physical also. Information is physical? Sounds crazy, but maybe not. The DNA in every one of your cells is a molecule with three billion base pair connections. Your DNA is both the information and the mechanism for assembling and preserving your physical make up, your body, no “you.” But what are “you” beyond your DNA-built structure? Personality and Memory. Where do your personality and memory reside? In the 80-100 billion neural connections that make up your brain. When your body, which includes your brain, dies, there is no mechanism for the transfer of the information contained in the neural connections of the brain. When you die, your memories and your personality cease to exist, just like they did not exist before you were conceived, born, and programmed and reprogrammed by your experiences.

Are you depressed yet?
Is there any good news?

Let’s start with the misconceptions that all of us have about ourselves.

First: There is no person inside or underneath your brain. There is certainly a subconscious or non-conscious function of the brain and nervous system. But, there is no “homunculus,” no little you inside that steers the outer you around the way a “soccer mom” drives an SUV. The illusion of a “separate internal you” may have a lot to do with the way our brain is programmed to interpret the electro/chemical impulses it receives through the optic nerve. You are mind, body, personality, memories and all the input and output that are part of a conscious entity. There is nothing unseen or underlying. What you see is what you get!

Second: and more importantly, you are not sealed off from reality. You are a glob of matter, constantly bringing new matter in and expelling old. Every breath changes you. Also, information pours in through your eyes, ears, nose and mouth and through the soles of your feet and the palms of your hands. Every speck of information changes you. It is recorded in your nervous system and in the neural connections of your brain.

You are a part of reality, a part of the universe; not just a passerby on the way to an “eternal theme park.” You are dependent upon and connected to everything close around you and connected to and dependent upon the earth and the sun and all the other stars in the cosmos. And that connection, that dependency is not just for shelter, food and breath, but for stimulation and information. Consciousness, and all life has consciousness, is the constant quest for information.

Here’s something else. And I don't pretend to understand the science or mathematics that underpin the “core theory of physics” or quantum mechanics. Here’s the something else - The observer matters!

Do you remember hearing about the dual slot experiment which raised the issue of whether light was a wave or a particle? It used to be an issue, but the answer is now settled. It’s a wave. In

fact, everything is a wave until it is observed and then the wave function breaks down and it becomes a particle. It can be fairly said that observation creates reality.

What is an observation? It is the act by which the observing entity gets information. It is the transfer of information from the observed to the observer that changes both. It is literally the transmission of information that changes a wave to a particle. And what is an observer? Any recording device, but more importantly, bacteria, trees, frogs, snakes, Neanderthals, Denisovans and, in the 21st century, the most sophisticated part of the universe observing itself is the human being. Bacteria do get information from the world around them, but they cannot see the stars. A chimpanzee can see the Milky Way, but only a human can know what the Milky Way galaxy is, and what lies beyond.

Our brief lives are simply the “comedy” between the “tragedies” of birth and death. But, if anything deserves to be “held in awe” or to be called “holy,” it is that comedy. That comedy we live, you and I, is the universe finally, finally, in full awareness of itself. Is it absurd? Yes. Is it all a psychological trick? Yes. But, it is also the greatest and most comforting of thoughts. So what are we to do?

- Accept and be comfortable with your temporary nature.
- See the world around you as “Beauty and Truth.”
- Create value.
- Create meaning.
- Rearrange your reality.

The time and the materials are in short supply. Savor every moment.

So here are my last questions: If you truly understand your place in the universe, how can you open your eyes in the morning and not be awestruck by the glory around you?

How can you know your place in the universe and not be sure that, in and for this instant, you are the exact center of all creation and that all creation itself is dependent upon you for meaning and existence?

How can you know your place in the universe and not smile and be fulfilled?

How can you know your place and not smile?