

Mystery of Evolution - Two World Views

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*First, I have two handouts. For those of you who will benefit by reading my message while I talk, I have printed versions.

And, since this is an intergenerational service, for those of you who will benefit from an activity while I talk, I have these sheets of pictures relating to what I will say. When you see a picture on the screen, of a person or something else I mention, find it on the sheet of paper and circle it. For example, there is a picture of two people, looking very stern at each other, on the screen now. Can you find that picture on the sheet of paper? Circle it. There is one extra picture on the paper. After the service, I will give a prize to everyone who shows me which picture is extra, having not appeared in my talk.

By the way, the two stern men in the picture are Bishop Wilberforce and Professor Huxley, who participated in a public debate on Evolution a year after Charles Darwin published the book, *Origin of Species*.

Today is the turning of months, from a month in which our Congregation's worship service theme has been 'mission', to one in which the theme is 'mystery'. I will be talking about how a mystery has led me to understanding of mission.

The title for my talk, 'Two World Views', is based on a famous book by the Renaissance scientist Galileo*, entitled *Dialogue Concerning the Two Chief World Systems*. Galileo was contrasting two scientific theories of the universe, one that Earth is at the center, the other that Sun is at the center. Galileo was a remarkable genius, quite important to me for my professional career. I designed space telescopes for NASA, and it was Galileo who first turned a telescope to the stars.

But it was not Galileo's question, or even a physics or astronomy question, which led me to my internal dialogue concerning two world views. It was a biology question, namely whether or not the theory of evolution was true.

I was raised in a conservative Christian home. My parents believed that the Bible was the word of God and that the book Genesis was clear that each species of life had been separately created by God. At school, however, we constructed a large wall chart of the tree of life*, showing how different kinds of animals are related to each other, with each student researching a portion to fill in. Next year we made insect collections, with the specimens classified by family. So I came to contemplate which of these is true.

First thought - well, the evidence is heavy for evolution. The scientists, the ones who actually study the question, are all for evolution.

But, if the Bible* is the word of God, shouldn't that outweigh all the other evidence? Now

the question was whether the Bible really is the word of God. I had read and studied the Bible, and had a high regard for it. I still have a high regard for it, but that regard falls short of judging it completely absolutely correct throughout. Now, when I was contemplating this as a young person, I knew that there were also people who regarded the Quran as the word of God*. I knew practically nothing about the Quran, but realized I ought to consider the question of how one could figure out which book, if any, was the word of God.

It would be nice if there was some higher authority which could answer the question, but what could be a higher authority than the word of God, on the one hand, and the creations of God, on the other?

An answer, of sorts, then occurred to me. I had heard of philosophy. It seemed like an all-encompassing subject, which could sort out the relationship between science and religion. So, at the age of fifteen, I acquired a book, "Essays in Philosophy," and began reading. It consisted of short excerpts from about twenty notable philosophers. Each disagreed with all the others. I had replaced a choice between two options with a choice among twenty options!

I began the task of comparing these philosophies, and constructing my own. I did not realize, then, that the very act of constructing my own philosophy moved me toward becoming a Unitarian Universalist. Coincidentally, it was this very same time that the Unitarians and Universalists were merging to form the UUA.

The philosophical essays were a mixed bag. I was disappointed that the small section from Karl Marx told me nothing about Marxism. I did learn that the philosophies we currently know much about began in ancient Greece. I did find one essay that was helpful, by Immanuel Kant, from his "Critique of Pure Reason"*. He explained the difference between a mathematical truth, and a fact about nature, and that there were different ways of knowing each. So, I realized, there are different kinds of truth, and different ways of knowing them. Perhaps that could explain evolution versus separate creation. Kant also offered a basis for morality, but I found his efforts here less satisfying than his logic and science.

But the issue of evolution remained incompletely resolved within me. I entered college and chose to major in physics. I learned a lot of mathematics and I learned the scientific method, both sides of Immanuel Kant's dichotomy. I also continued in the Baptist church with my family. I accepted Jesus' message, and the messages of prophets on whom he drew, and apostles whom he inspired.

I hoped that these would be compatible. This hope was perhaps encouraged by the title of another selection in my book of Philosophical Essays, namely "Evolutionary Love" by Charles Sanders Pierce.

During this period of my life, I learned about important imperfections in what I was taught. In a high school geometry class my teacher forgot that a square root can be either positive or

negative*, and accidentally proved, on the chalk board in front of the whole class, a clearly false conclusion. To his credit, and the benefit of us in his class, he realized it, admitted it, and corrected the error. (We need some politicians like that.)

About this time, in church, we had a lesson on the Parable of the Good Samaritan. We learned that we should be kind to each other, and help those who were injured. I thought about the big hospital in our city of Indianapolis, which is called the Methodist Hospital*, and realized it had been founded by religious people. We had attended both Methodist and Baptist churches, and I was now proud of the Methodists.

But I have always liked to read. So, in addition to hearing the lesson, I read the parable in the Bible; and I went back to the chapter before, so I could understand why Jesus told the parable, and I read on to the next chapter. I realized that Jesus was taking aim at the racism of his day, saying that a despised race, the Samaritans, could be just as good as anyone else. Shortly afterward, I learned that my church had turned away a Black family who had come to Sunday service. I was appalled. My church was going directly against Jesus' teaching. So a religious authority could be just as wrong as my geometry teacher, except it took my church decades to mend its ways, rather than a few minutes.

Incidentally, the next chapter after the Parable of the Good Samaritan tells how Jesus discussed philosophy with a Samaritan woman drawing water from a well, and how his disciples were upset with him about this. So I concluded Jesus was also opposed to sexism.

I also learned that not only can mathematicians and preachers be wrong, so can scientists. A notable example, connecting to the question of Evolution, is the 'Piltdown Man' fossil.* This was accepted for decades by some as an ape-man fossil, but eventually proved a fraud. Now, of course, we have many genuine fossils connecting apes and humans, verified by careful analysis.

These concerns about people in authority confirmed my inclination to resolve issues by my own direct investigations of evidence. This decision had far-reaching consequences. I was turning from the authority of Bishop Wilberforce, who expressed indignation at being told he was descended from a monkey, to the scientific method of Professor Huxley, who responded he that would rather be related to a monkey than to a bishop who used his intellect to obscure the truth.

Turning now to evidence, I realized much evidence was right in front of me. In elementary school I had made an insect collection, arranging the specimens by order and family.* Evolution explained why the species fell neatly into groups, why it's so natural to call those groups families, and why those families fell neatly into larger groups.

Since then I have found much more evidence for evolution. I have also found that claims of evidence against evolution are cases of misunderstanding evolution, or of misunderstanding the evidence, or cases where we have not yet traced the course of evolution, but are likely to, if more evidence is found.

I have also come to understand the relationship between the Bible and evidence. The Bible does contain evidence: evidence of the kings of Israel and Judah, evidence of the teachings of Jesus, of the prophets, and of the apostles. But it does not constitute evidence of the creation because neither the authors, nor anyone else who could have told them, was present. Evidence of creation will instead be found in the rocks and the stars.*

Science can also be applied to the Bible. A scientific comparison of the Bible with other ancient writings is very important to understanding it, as is archaeological knowledge of ancient cultures. Textual analysis shows which portions have the same author, and which portions have different authors. In some cases it even shows verses which are later insertions into the text, either erroneous or fraudulent.

I also came to realize that the Bible does not actually say evolution is incorrect. The first chapters of the book called Genesis aim at defining relationships between people and nature, and between people and God, as understood by the authors. I believe the authors would be quite surprised to learn that some modern people feel these chapters were dictated to them by God and provide a precise description of the process of the origin of the many species of life.

Ironically, I found that a more definite contradiction between science and the Bible came from my own field, physics. As a graduate student I measured the age of the solar system to be about four and a half billion years, and I had done all the necessary experiments and observations to know this without relying on any authority.*

My acceptance of Evolution has affected my life far beyond knowing some biology, both in my thoughts and my actions.

As I see it, Evolution looks forward while Authority looks backward. Evolution shows that we can make progress, though it does not prove that we will. Authority hangs on to what has been proclaimed in the past.

In another direction, Evolution can be contrasted with Revolution. When I joined a political organization in college I chose an evolutionary socialist group, and rejected revolutionary socialism as well as conservatism.

Our denomination, Unitarian Universalism, is the product of an evolution, and we accept that we continue to search for more truth and meaning.

Thus, we embrace both scientific Evolution and religious Evolution. As evidence of this, soon after I joined this Congregation, we invited Reverend Michael Dowd to make a special presentation on "Thank God for Evolution".

Nevertheless, we accept the Christian Bible as one of our sources; but not as the sole source, and not as an inerrant Word of God, but as one among many sources,* listed in six categories, near the front of our hymnal. Just as a good scientist seeks all the available data,

so too a good Unitarian Universalist seeks all the available sources of positive values.

This distinction between scientific facts and theories versus moral values, which became clearer to me as I pursued the mystery of Evolution, can be illuminated from our chalice lighting words. One clause says, “treat all people kindly because we are all one family.” The science of Evolution tells us “we are all one family.” It is our values which tell us to “treat all people kindly.”

In fact, others have grafted other moralities onto Evolution, such as ‘Social Darwinism’, which was never endorsed by Darwin himself, and the Eugenics movement. Social Darwinism took Evolution by survival of the fittest as encouragement to a struggle for survival among people, justifying war and even genocide. Eugenics encouraged supposedly superior people to prevent supposedly inferior people from having children, including by forced sterilization.

As these movements were developing, Alfred Russel Wallace, who discovered Natural Selection concurrently with Darwin, wrote, “Although we have progressed vastly beyond the savage state in intellectual achievements, we have not advanced equally in morals.” I consider these movements to have been a retrogression, rather than advancement.

But the alternative viewpoint has also developed among evolutionary biologists who have considered moral issues. Lynn Margulis,* the champion of the concept that the mitochondria within our cells evolved from bacteria which entered into cooperation, wrote, “We consider naive the early Darwinian view of ‘nature red in tooth and claw.’ Now we see ourselves as products of cellular cooperation — of cells built up from other cells. Partnerships between cells once foreign and even enemies to each other are at the very roots of our being. They are the basis of the continually outward expansion of life on Earth.”

In conclusion, there are three matters I would like to leave you with.

First, is the importance of evidence. And I would comment that I believe the actual reason Galileo, with whom I started this talk, was convicted of “vehement suspicion of heresy” was not that he taught that the Earth revolved around the Sun, but that he reached that conclusion based on evidence rather than authority. Evidence is especially important these days when truth is most threatened not just by authority but also by extreme and sarcastic verbiage repeated many many times and distributed ubiquitously by electronics.

Second, is the value of mystery. Working on a mystery sharpens our brain, whether or not we solve it. As Maria Mitchell,* America's first internationally renowned astronomer, and a Unitarian, said to her students at Vassar, “I cannot expect to make you astronomers, but I do expect that you will invigorate your minds by the effort at healthy modes of thinking.”

Third, there is grandeur in this view of life, as Darwin wrote, in the closing words of the 1860 edition of *Origin of Species*, quoted as our centering words.

Evolution is not just a scientific account of the origin of the diversity of species, it is a view of life. It has its several powers, having produced the comparatively simple cells of amoebas and the complex hierarchy of cells and individuals in a honey bee hive.*

Darwin's book is not about the origin of life, but he acknowledges a Creator, without however indicating whether the Creator is a god or simply the laws of physics and chemistry. Darwin is uncertain whether the origin was of a few forms, such as a first plant and a first animal, or of just one. We now know that plants and animals, even protists and bacteria, use almost exactly the same genetic code, and produce many of the same proteins, strongly indicating just one origin.

With Darwin we acknowledge the many daily and yearly cycles of our planet which measured the extraordinary amount of time for the process. The laws of nature have remained fixed beneath the ever changing connections of atoms, molecules, cells, individuals, species and ecosystems.

The forms of life are potentially endless. They are most beautiful, from the tiny rotifer to the exquisite Hawaiian hibiscus. They are most wonderful, from the mold which gives us penicillin to the dragonfly which hovers in place.

Not only have these forms been evolved, but evolution continues, and we are a part of it. I hope we will advance in morals as much as in intellectual achievements.

Now, our choir has graciously agreed to perform a musical presentation of Darwin's words. Thank you.*