

“They” Make Everything Up

Ecclesiastes 3:9-14

John 20:19-29

You probably need a little background as to why I am giving this sermon. Last fall, I noticed that Rev. Frank Yates was giving an OLLI class on the Philosophy of Religion. It sounded interesting so I enrolled in the class. It was an excellent class with people from very diverse religious backgrounds: all the way from agnostics, atheists to Christians and a few Presbyterians scattered in the mix. One of the topics along the way was science and religion. Frank indicated that as I knew more about science than he did, I should teach that class; so I did. Sometime later Roger asked me if I could provide a sermon on science and religion based on my presentation in the class. So, that is where I started for today.

However, as the philosophy of religion class was not scripturally based, you are spared the standard 50 minute repeat of the classroom lecture. Instead, I am going to provide a short intro to science 101, review how science and religion (particularly Christianity) started facing off against each other, and wrap up with how I balance science and religion.

Let’s start with a discussion between two cynics:

First - “God is Dead!”

Second - Show Me the Body!

Second - “God is Alive”

First - I don’t see God

Second - “God Exists”

First - Prove It

First - “God Doesn’t Exist”

Second - Prove It

God apparently depends on our five senses. If we can’t see/smell/taste/hear/feel something, then it is difficult to prove that there is something there. If you want to know if something exists, then you have to ask questions to discern its nature. For centuries, we have been trying to understand the Universe; this place that we occupy a very small part of. The basic question is: what is it made of? Gas? Matter? Light?

The answer comes back – all of that and more. Let’s start with the basic building blocks of matter – atoms. There is a geeky scientific joke that goes: Why shouldn’t you trust atoms? Because “they” make everything up! We have struggled for centuries to gain an understanding of atoms. Most of this was based on philosophy and asking questions. This started with the Greeks and then continued with religious people as Christianity took hold into the Middle Ages. However, with the Renaissance and the Reformation, somehow, the focus seemed to separate. What used to be called Natural Philosophy morphed into Natural Science, while philosophy began to focus on human existence, freedom, and being.

This seems to be the beginning of the Science vs Religion “War”. If something was science based, then it couldn’t be religious, and if something was religious, it couldn’t be scientific. To help understand this apparent conflict, let’s start with Science and what it is.

A systematic study of the structure and behavior of the physical and natural world through observation and experiment.

Systematic Study → Scientific Method

Formulate hypothesis

Design and conduct experiment to test hypothesis

Compare observed results with results expected if hypothesis is correct

Draw Conclusions (hypothesis is correct) → Publish Results



(hypothesis is incorrect)

Refine hypothesis (test again)

Seek independent Verification

General Acceptance of Hypothesis

Continued testing to verify

(multiple aspects/ predictions)

Returning to the atom - there is agreement that atoms exist, and that “they” make up everything. How did we come to that agreement, when we couldn’t even see them until about 30 years ago?

In the early 1900’s JJ Thompson proposed an atomic model where **an atom is made up of a positively charged sphere into which negatively charged electrons are implanted**. Because electrons and protons have the same magnitude of charge, an atom as a whole is electrically neutral.

Around 1910, Ernest Rutherford performed an experiment to determine what an atom “looked” like.

Hypothesis – Thompson model is correct

Experiment - Rutherford, in his experiment, directed high energy streams of heavy, positively charged alpha-particles at a thin sheet of gold foil. To study the deflection caused to the positive particles, he placed a fluorescent screen around the thin gold foil. If the hypothesis (and therefore Thompson’s atomic model was correct), there should have been a uniform distribution of flashes on the screen. (side note, one of the graduate students involved in counting flashes on the screen was Hans Geiger – possibly why he later invented the Geiger counter so he didn’t have to sit in the dark all day and count flashes.)

Observed Results showed

- A major fraction of the α -particles directed towards the gold sheet passed through the sheet without any deflection, and hence **most of the space in an atom is empty**.
- Some of the α -particles were deflected by the gold sheet by very small angles, and hence the **positive charge in an atom is not uniformly distributed. The positive charge in an atom is concentrated in a very small volume**.
- Very few of the α -particles were deflected back, that is only a few α -particles had nearly 180° angle of deflection. So, the **volume occupied by the positively charged particles in an atom is very small as compared to the total volume of an atom**.

Rutherford's observation showed the hypothesis was incorrect. He published the results and suggested a new model of the atom:

- The positive charge and most of the mass of an atom is concentrated in an extremely small volume. He called this region of the atom as a nucleus.
- Rutherford's model proposed that the negatively charged electrons surround the nucleus of an atom. He also claimed that the electrons surrounding the nucleus revolve around it with very high speed in circular paths. He named these circular paths as orbits.
- The electrons being negatively charged and the nucleus being a densely concentrated mass of positively charged particles are held together by a strong electrostatic force of attraction.

This was a major step forward in atomic and nuclear physics, but his model was still not quite correct. Additional refinements give us the model we have today.

In science, contradictory results are just as important as those that verify a hypothesis. Also, differences no matter how small are more important than similarities because one counter-example can prove a hypothesis false. The process requires careful observation and experimentation – systematic, careful collection of measurements / counts.

Notice also that Rutherford never saw a nucleus or an atom, but proved their existence by the way they behaved. Once a theory is in place, it can be checked and refined to give a better understanding of a phenomenon. By asking the right questions, we come to “prove” that something is true.

Why can't you trust atoms because “they” make up everything;, but if “they” make up everything then you have to trust them. Trust this podium to be solid to hold up the Bible and my notes.

So how does science fit with religion? We read the scripture passage for John that depicts the response of “Doubting” Thomas to the other disciples when told Jesus had appeared. As Roger mentioned in his sermon a couple of weeks ago, at this point, Thomas is probably more like us than the rest of the disciples. He needs to “see” to be convinced. Rather than call him doubting, I think we ought to refer to him as Thomas, the Scientist. He uses the results of an experiment to test the hypothesis that Jesus is back. From the results he concludes that in fact, Jesus is back. For him seeing was believing. What about the other disciples? Were they any different than Thomas? Not so much as they believed after Jesus showed them his hands and side. So, in essence, they also are basing their beliefs on experimental results – but probably didn't realize they were doing an experiment.

How about the others that Jesus refers to – those who believe even though they haven't seen? Are they religious but not scientists? Does that make Thomas a scientist but not religious?

Or is Thomas the link between science and religion? Was Thomas being religious when he asked for proof? One definition of religion is the belief in and worship of a super-human power. On that basis there appears to be no conflict between science and religion. Thomas could believe in the Resurrection while still asking questions to understand what he was seeing. One can perform experiments to understand the behavior of nature while believing in a god who creates that nature. The disconnect seems to come when trying to use the results of the experiments to prove that God exists or doesn't exist.

According to the reading from Ecclesiastes, "God has made everything suitable for its time; moreover, God has put a sense of past and future into "our" minds, yet we cannot find out what God has done from the beginning to the end. ... I know that whatever God does endures forever; nothing can be added to it nor anything taken from it; God has done this so that all should stand in awe before God."

As a scientist, I can understand how clouds form, how mountains are made, and the processes that shape them over the eons. However, there is no science that gives me predictions of how banks of clouds fall over the Sandia crest in waves to stir my heart and soul creating a response that can only be – How marvelous are your works, O Lord.

Ethan Sigal in a piece written for Forbes Magazine entitled, "Yes, Science Is For The Religious, Too, states *The truth of the matter is that there are certain unknowables in this Universe; certain questions that even if we gathered all the data we could ever gather, we'd be unable to answer. The amount of information we have access to is enormous, but finite nonetheless. There will always be room for wonder, and there will always be questions beyond humanity's capabilities of drawing robust scientific conclusions.*

So, what do historical figures say about science and religion?

Galileo Galilei (1564-1642): is widely viewed as someone who "stood up against the church". In a letter to the Grand Duchess Christina of Tuscany, he wrote:

I do not feel obliged to believe that the same God who has endowed us with senses, reason and intellect has intended us to forego their use and by some other means to give us knowledge which we can attain by them. He would not require us to deny sense and reason in physical matters which are set before our eyes and minds by direct experience or necessary demonstrations.

Pope John Paul II (1983 on the 350th anniversary of the publication of Galileo's great work, **Dialogue Concerning the Two Chief World Systems (Ptolemaic and Copernican)** reiterated his remarks to the Pontifical Academy of Sciences on November 10, 1979 [pp. 1464-1465].

"I hope that theologians, scholars, and historians, animated by a spirit of sincere collaboration, will study the Galileo case more deeply and, in frank recognition of wrongs, from whichever side they come, will dispel the mistrust that still forms an obstacle, in the minds of many, to a fruitful concord between science and faith."

Sir Isaac Newton (1643-1727): British scientist, astronomer, mathematician and a theologian, he was a devout Christian (though he rejected trinity).

Gravity may put the planets into motion, but without the divine Power, it could never put them into such a circulating motion as they have about the Sun; and therefore, for this as well as other reasons, I am compelled to ascribe the frame of this System to an intelligent Agent.

It is the perfection of **God's** works that they are all done with the greatest simplicity. **He is the God of order and not of confusion.**

Einstein's science and religion – by Benjamin Ogles - *Albert Einstein (1879-1955):*

*Einstein resolved the conflicts between religion and science by explaining the two fields' precise interaction. This reconciliation functions by exploiting the inabilities of each field and using the one to complete the other. Science only addresses facts and their relations to other facts; religion only addresses "evaluations of human thought and action" ... Einstein summarizes this coexistence by writing that "**science without religion is lame, religion without science is blind**" ... Having explained the relations between these fields, Einstein states that any conflicts are the result of infringement. He believed that science cannot explain what should be and religion cannot explain what is. Conflict results from a clash between the science of an advanced but materialistic age and a religion maintaining its mythical beliefs. Einstein supports making science moral and divesting religion of its mythos.*

Where does that leave us with science and religion? There is no clear cut winner, but neither is there a need for a loser. The crux of this middle ground is that science and religion are both necessary because they keep each other in check.

That's why I've never seen science and religion as at odds. We need both to be grounded, and we need both to live in this world as mortals. I am a scientist/engineer with Christian beliefs – the two are not and do not need be mutually exclusive.

So how do we find peace with both? Dan Brown in his book [Angels & Demons](#), has a character who is a scientist, but who marvels over creation, nature, and the mysteries of the world:

"Science tells me God must exist. My mind tells me I will never understand God. And my heart tells me I am not meant to."

So, pondering the co-existence of science and God, he goes on to say:

"Whether or not you believe in God, you must believe this: when we as a species abandon our trust in a power greater than us, we abandon our sense of accountability. Faiths... all faiths... are admonitions that there is something we cannot understand, something to which we are accountable. With faith we are accountable to each other, to ourselves, and to a higher truth. Religion is flawed, but only because man is flawed. The church consists of a brotherhood of imperfect, simple souls wanting only to be a voice of compassion in a world spinning out of control."

Some of you participated in this year's Lenten study using the book, "LENT is not Rocket Science," by Nicholas Knisely, an Episcopal Bishop who before studying for the priesthood, was a graduate student studying Physics and Astronomy. Throughout his book, he uses examples from Cosmology and Physics to highlight questions about mystery and reality. As he says in the book, *"God is not nature, nor is God bounded by nature, but God is most certainly nature's author – and nature's 'words' can point us onward to that which is beyond its bounds."*

Just as each of us may have a different experience associated with a given word, each of us has a different emotional response to nature's 'words' – those ways in which we sense reality. The problem arises as we have a limited vocabulary with which to describe what we are sensing. In many cases, we can only appreciate nature's 'words' when we give up trying to explain the mystery.

Let's come back to atoms; "they" make everything up; but I can't explain why they exist. "They" make up the human body, but there is a duality to our existence: rationality and spirituality. How can something be rational and spiritual? That is a mystery, Unrevealed until its season, Something God alone can see.

AMEN

Benediction

May the strength of God pilot us;
May the wisdom of God instruct us,
May the hand of God protect us,
May the word of God direct us.
Be always ours this day and for evermore.
And let the people say, ... Alleluia, AMEN!