

# WEEK #1 "INTRO TO SCIENCE & RELIGION" (Handout 1 of 2)

By Pastor Daren Erisman—Jan. 16, 2011

## Introduction

- How the class will work
  - Teaching with scientists: Mark Reynolds (Biologist) and Steve Goetch (Physicist)
- Goals:
  - Get a sense of the relationship between Science and Religion (specifically Christianity)
    - History of relationship
    - Major concepts
    - Impact on the world today
  - Insight into the mindset and aesthetics of science and practicing scientists
  - Reflect on how we may view our faith in light of the relationship between science and religion.
  - Regardless of your background or lack of background in science, these classes are meant to immerse you in the basic tenants, the questions and perhaps even a few answers to the relationship between science and religion that touches all of our lives.

## What do I mean by "Religion and Science"?

- **Religion:** The focus will largely be on Christianity, though many of the principles would apply to other religions as well (certain aspects will be extended particularly with regard to Islam)
- **Science:** The focus will be on the physical sciences such as physics, chemistry, or biology, and less on the social sciences of psychology, anthropology, sociology, etc.

## Why worry about "Religion and Science"?

- **Importance of updating religious dialogue in terms of science**
  - Not a flat earth or earth-centered universe.
  - Greater understanding of weather, plate tectonics, diseases, sexual reproduction, genetic inheritance, the age of the earth, time and space, energy and matter, ...
  - Not Aristotle's metaphysics or Newton's classical physics, but Einstein's relativistic physics and the rich field of quantum physics and complexity.
- **Science not only has explanatory power, but the power of significant resources** and is perhaps a new "superpower" in the world that crosses national boundaries, ethnicities, etc.
  - Science plays a role in the world that has in the past been given to religion.
  - And for many, the expanding knowledge of the sciences seems to leave little room for religion, let alone God.
  - **Stephen Hawking**, the famous physicist writes:
    - "So long as the universe had a beginning, we could suppose that it had a creator. But if the universe is really completely self-contained, having no boundary or edge, it would have neither beginning nor end: it would simply be. What place, then, for a creator?" (Hawking, 1988:140-1)
  - In effect, science seems to push religious knowledge into the shrinking gaps that science cannot yet answer or is uninterested in answering.
    - **"God of the gaps"**
    - For some, these gaps will inevitably close.
- **Religion has responded in many ways**, some of which we will soon talk about.
  - From trying to go head-on with science by seeking to explain the Bible's scientific importance and predictive qualities, to isolating itself in areas of knowledge where it cannot be "touched" such as mysticism and mystery.

- **Yet, few people are ready to fall into any one category or approach to science and religion.**
  - The reality is that there are scientists who struggle with what their faith means in light of the work they do.
  - And it is perhaps clear to everyone that neither science nor religion is going to simply disappear.
- In fact, with the advances in science in terms of the ability to identify and alter genetic traits, let alone cloning, **there is a real need for science and religion to work together** in terms of discussing the issues of what it means to be “human” and what the parameters should be in terms of scientific manipulation and experimentation.
  - Should a deadly virus be created simply because it is possible?
  - Should genetic manipulation be discarded if it could save the life of a child?
- **What about public policy?**
  - Should the warming of the world’s atmosphere and oceans be treated as something that “God should handle”?
  - Is AIDS God’s punishment for promiscuity, or is it a virus run-amuck to be dealt with by both scientific advancement and human cooperation?
- The issues around these kinds of questions can cause some to question their faith in God, or to question their faith in the religious institutions that try to respond to such issues.
  - The relationship between science and religion is important.
  - In fact, it is vital to the future of the whole world.

#### **The nuanced relationship between science and religion: Galileo Galilei (1564-1642)**

- The famous censorship and house arrest of Galileo by the Catholic Church in the 17<sup>th</sup> century is often used as a prime example of the enmity between religion and science.
  - For those who despise religion or its involvement with the sciences, it becomes a kind of a Genesis story that shapes a basic notion: Religion should stay out of the way of scientific advancement; religion is holding us down, look at Galileo!
  - Yet, is it so simple? In reality, the fuller story of Galileo gives insight into the forces and nuances that are often ignored by those who would “take sides” regarding Galileo...
- **Background**
  - **Protestant Reformation:**
    - Relative secularity of Pope Alexander VI (1492-1503) and Pope Leo X (1513-1522)
    - Reformation sparked by Martin Luther in response to Pope Leo X’s use of indulgences to fund the rebuilding of St. Peter’s Basilica in Rome (1517)
  - **Catholic Counter-Reformation:**
    - Began with the Council of Trent (1545-1563) called by Pope Paul III.
    - The Council and subsequent actions were aimed at creating a more educated and loyal clergy that reinforced Papal rule and expectations.
    - Important Church “Orders” were formed at the time such as the Jesuits who sought to protect the Papacy and renew the church.
  - **Copernicus and the need for an accurate calendar**
    - **Nicholaus Copernicus (1473-1543)**, the polish mathematician was working on a more accurate solar calendar (Julian) to set important festivals such as Easter. By the 1500s the Julian calendar was off by 10 days since the 4<sup>th</sup> century.
    - In the process, Copernicus developed the model of a sun-centered solar system instead of the **earth-centered Ptolemaic universe** that had the sun and planets revolving around a stationary earth. His work was published as he was dying: *De Revolutionibus* (1543).

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### Galileo cont...

- The **Copernican model** was first treated as a mathematical convenience though it became clear that this was more than mathematics, it was redefining how the universe was understood to work and subsequently, the Church censored Copernicus' work (in the 17<sup>th</sup> century). It was to be understood as a *hypothesis*.
- Interestingly, the **astronomical data at the time did not support the Copernican model any better than the Ptolemaic model** because the Copernican model suffered from using perfect circular orbits of the planets. Only later, with the work of **Johannes Kepler (1571-1630)**, was it realized that the orbits of the planets were elliptical.
- **Galileo (1564-1642) literally changes the world**
  - Born into the critical time of the Catholic Counter-Reformation
    - Galileo was born in Pisa and taught mathematics in Padua and later, Florence. He was a devout Catholic and brilliant mathematician who in his time was **one of the few early adopters of the Copernican sun-centered universe**.
  - Obtaining the principles of the telescope, **Galileo builds his own telescope (1609)** and makes some startling discoveries:
    - He witnesses the craters of the Moon, the phases of Venus, moving sunspots on the surface of the sun, and the moons of Jupiter—**none of these were predicted by the Ptolemaic model**.
      - If Jupiter could carry four moons around with it, why couldn't the Earth carry its own moon with it as it circled the sun?
  - **Galileo did not ignore his faith**, but sought to make sense of scripture in light of his belief in a Copernican system
    - In an important letter, he wrote to the Grand Duchess Christina in 1615 that Scripture was given to show "**how to go to heaven**" rather than "**how the heavens go**." He believed that in reality there was not a conflict with scripture itself, but only in its interpretation and warned the Church that the interpretation of scripture should not go against the demonstrated truths of science.
  - **The Church leaders were not against science**, but were cautious in light of the poor astronomical data of the time to challenge traditional interpretation of scripture.
    - Though Galileo's observations certainly demonstrated that a sun-centered universe was more likely, **Galileo ignored or disbelieved in Kepler's theory** of elliptical planetary orbits and therefore, at the time, his sun-centered system, circular planetary system was not more accurate than the best earth-centered system of **Tycho Brahe (1546-1601)** which incorporated the Copernican theory by having Mercury and Venus rotate around the sun rather than the earth.
    - Ironically, **Cardinal Bellarmine**, the primary person responsible for dealing with Galileo for the Vatican until 1621, wrote that if a sun-centered universe were proven, then "one would have to proceed with great caution in explaining the Scriptures that appear contrary, and say rather that we do not understand them than that what is demonstrated [by science] is false."
  - **More about power, personality and perception than about scripture and science**
    - Galileo was at first reprimanded by the Church to teach Copernican theory as only another hypothetical model and was later censored, sentenced and imprisoned under house arrest due to the publishing of a book that he thought had been sufficiently approved by the Church. Galileo's arrogant personality combined with conflicts with both the Dominicans and Jesuits did not help matters. He continued to fruitfully work on the physics of falling bodies.

## Political, social and financial forces today shape both science and religion

- Scientific research is driven by if not directed by scientific funding and politics.
  - In essence, the **Cold War** influenced the “**Race to the Moon**” funding of scientific projects in the 60s and 70s along with the “**Star Wars**” funding in the 80s for technology to deal with a nuclear missile strike.
  - **NIH** (National Institutes of Health) funding shapes a vast amount of scientific projects and is influenced by each incoming Administration’s agenda.
  - **Commercial interests** in the genetic manipulation of animals and crops have given rise to numerous scientific research projects for the past number of decades.
- To be honest, **there have always been patrons of some sort that have shaped scientific discovery and influenced those results.**
  - If you have several equally probable solutions, how do you choose which one?
  - What scientific paths are discarded or ignored due to the lack of resources or personal interest?
- **Religion has likewise been influenced by its history and patronage**
  - The effects of the Christian Church becoming the imperial religion of the **Roman Empire** are profound.
    - Buildings, governance, clothing, language, ...
  - The political desires of the **Princes of Germany** helped give reality and definition to the Protestant Reformation.
    - More congregational power, reading the Bible independently with sometimes little regard for how it has been interpreted in the past, a more “me and God” rather than a “we and God” emphasis, ...
  - **American religion** is extremely shaped by forces of immigration, vast resources, diversity of population and a sense of manifest destiny.
  - **Modern social and historical forces shape modern religion**
    - Slavery, gender, ethnicity, persecution, immigration, wealth, poverty, political persuasion, terrorism, etc. all create lenses in which we read and interpret the Bible.
    - Television, the rise of large mega-churches, and the socialization of the internet are some of the forces currently shaping religion.
- **Science and Religion shape each other**
  - Historically, the desire to better understand God through God’s creation has been a significant influence for scientists over the centuries.
    - Believing that there is an order to the world and not just capriciousness has stimulated scientific discovery.
  - Scientific discoveries have influenced religion.
    - Copernicus and Galileo certainly shifted the perspective of the cosmos and other discoveries such as in archeology, biology and physics have both challenged and nuanced how we read the Bible and understand our faith.

## Barbour’s 4-Fold Typology: Ways in which people have related science and religion

- **Conflict** → At War
- **Independence** (“non-overlapping magisteria”—Stephen Jay Gould) → Compartmentalize
- **Dialogue** → Active Discussion (though mostly one-sided)
- **Integration** → Unifying

“the religion that is married to science today is a widow tomorrow, while the religion that is divorced from science leaves no offspring tomorrow.” (Holmes Rolston III, 1990:87)

**An accessible resource:** Barbour, Ian G., *When Science Meets Religion: Enemies, Strangers, or Partners?* (San Francisco: HarperSanFrancisco, 2000).