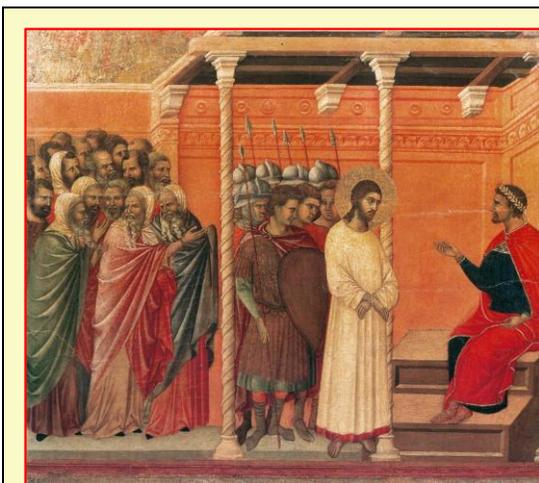




I would like to begin by acknowledging that the land on which we gather is the traditional territory of the Haudenosaunee, and most recently, the territory of the Mississaugas of the New Credit First Nation. The territory was the subject of the *Dish With One Spoon Wampum Belt Covenant*, an agreement between the Iroquois Confederacy and the Ojibwe and allied nations to peaceably share and care for the resources around the Great Lakes. This territory is also covered by the Upper Canada Treaties. Today, the meeting place of Toronto (from the Haudenosaunee word Tkaronto) is still the home to many Indigenous People from across Turtle Island and I am grateful to have the opportunity to work in their community, on this territory.

Haudenosaunee pronunciation: h oh - D EE - n oh - SH oh - n ee Turtle Island is the name given to the continent of North America in various Indigenous oral histories.

We all eat out of the Dish – all of us that share this territory – with only one spoon. That means we have to share the responsibility of ensuring the dish is never empty; which includes, taking care of the land and the creatures we share it with. Importantly, there are no knives at the table, representing that we must keep the peace.



Duccio di Buoninsegna, panel from *Maestà*, 1311

**What is
Truth?**

This course will consider some different approaches to truth. Truth is difficult to define. Everyone knows what truth is: it is what we believe. However, no one can really say why we believe what we believe – other than by using the circular argument that it is true. Religion determines truth through revelation and intuition; and science through observation and experiment.

This course will mainly be concerned with the relations between religion and science. However, I have found that art is an excellent go-between. The story of *Christ before Pilate* as portrayed by Duccio illustrates some of the difficulty is determining what is true.



This is a clip from the movie *The Passion of the Christ* (2004), produced and directed by Mel Gibson. Jesus is played by Jim Caviezel and Pilate is played by Hristo Shopov. The movie uses Aramaic and Latin; this particular dialogue is in Latin. The movie was shunned by many because of its violence and purported anti-Semitism. Nevertheless, it does truthfully represent the story in the gospels

The interaction between Pilate and Jesus is reported in all four gospels. All report the question “Are you the King of the Jews?” Only the Gospel of John reports Pilate’s comment “What is truth?”

Then Pilate entered into the judgment hall again, and called Jesus, and said unto him, Art thou the King of the Jews?

Jesus answered him, Sayest thou this thing of thyself, or did others tell it thee of me?

Pilate answered, Am I a Jew? Thine own nation and the chief priests have delivered thee unto me: what hast thou done?

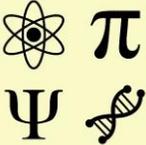
Jesus answered, My kingdom is not of this world: if my kingdom were of this world, then would my servants fight, that I should not be delivered to the Jews: but now is my kingdom not from hence.

Pilate therefore said unto him, Art thou a king then? Jesus answered, Thou sayest that I am a king. To this end was I born, and for this cause came I into the world, that I should bear witness unto the truth. Every one that is of the truth heareth my voice.

Pilate saith unto him, What is truth? And when he had said this, he went out again unto the Jews, and saith unto them, I find in him no fault at all.

(John 18: 33-38)

The story illustrates some of the problems of metaphor. Jesus is talking about a metaphorical kingdom, Pilate is worried about a real kingdom. We shall consider metaphor more fully later in this session.

<p>Science</p> 	<p>Originally the word meant knowledge of any kind</p> <p>Nowadays it means knowledge about the natural world derived through observation, analyzed by reason, and tested by experiment</p> <p>Sometimes it is differentiated from technology, which is the application of knowledge to control the world.</p>
<p>Religion</p> 	<p>An organized system of beliefs about matters beyond the grasp of science (“transcendent” or “supernatural”)</p> <p>A set of precepts that teach us how to act</p> <p>A program of rituals that display a community’s beliefs</p> <p>A collection of scriptures that delineate the beliefs, teachings and rituals</p>

The word “science” derives from *scire* – to know. This likely comes from the Indo-European root *skei* meaning to cut or divide (cf “schism”). This etymology focuses on the way science discriminates between things. I have defined science in terms of “knowledge” rather than belief. However, knowledge is generally considered as justified true belief. We shall return to these ideas later in this session.

I have defined “religion” in opposition to science. Perhaps this displays my biases. I have listed its three main attributes – morality, ceremony, writings.

The etymology of the word “religion” is not known. Some have proposed that it derives from *relegare* - “read again” – this focuses on devotion to the scriptures. Another idea is that the word comes from *religare* – “bind” – this considers the obligation of the believer to God and to his fellow believers. A third etymology is *religiens* – “careful” (as opposed to *negligiens*) – this points to the moral aspect of religion.

The scientific symbols are to illustrate the physical, mathematical, psychological and biological sciences.

The religious symbols suggest the four main world religions. The crescent and star do not actually have their origin in Islam. They were first used as a symbol for the Ottoman Empire (from the 16th Century CE) although they have been used by some Islamic institutions, e.g. the Red Crescent. Islam is against visual iconography. Perhaps calligraphy of Allah would be a better symbol. The Sanskrit “aum” symbol is generally used to signify Hinduism. Hindus believe that as creation began, the universal consciousness began with a vibration: the sound “OM.” The symbol of Buddhism is the *Dharma Chakra* – the wheel of the teaching

	Religion	Science	Art	Politics
Domain	Supernatural	Natural	Artificial	Social
Methods	Prayer Meditation Revelation	Observation Hypothesis Experiment	Conception Design Execution	Selection Communication Control
Process	Faith	Reason	Creativity	Compassion
Teaching	Scripture	Theory	Technique	Law
Purpose	Salvation	Understanding	Beauty	Justice

This slide shows some fields of knowledge wherein one can seek truth. Although we are mainly considering Religion and Science, I have added Art and Politics for good measure. The distinctions are not exclusive. For example, religion may also consider social behavior and, in some religious teaching, compassion can be considered more important than faith. And anyone who has submitted a research grant knows that politics affects science.

There has been some discussion of the meaning of “understanding” and “explanation,” with the former attributed to religion and the latter to science. I do not believe the distinction is correct and have used “understanding” for science. Nothing is ever fully explained.

We seek for truth in every domain. In religion, truth is what you believe in order to be saved. In science it is the way the world works. In art it may be how well the creation communicates an idea. In politics, truth is often missing. However, its goal is the just society.

Truth and politics should be friends. However, as Hannah Arendt says
 “No one, as far as I know, has ever counted truthfulness among the political virtues.”
 Yet, she also concludes, in the context of how we must act to improve our society,
 “We may call truth what we cannot change”
Truth and Politics (1967)

Scientific Realism

Jim Carry in
The Truman Show
Peter Weir, 1998



1. The objective existence of a real world independent of the observer.
2. This world runs according to unchanging rules. (There are no miracles)
3. Sense data provide a veridical representation of this world
 - a) Illusion can be corrected by means of corroborative evidence
 - b) Sensation may require specialized training
 - c) Sense data may be organized by *a priori* concepts such as space and time

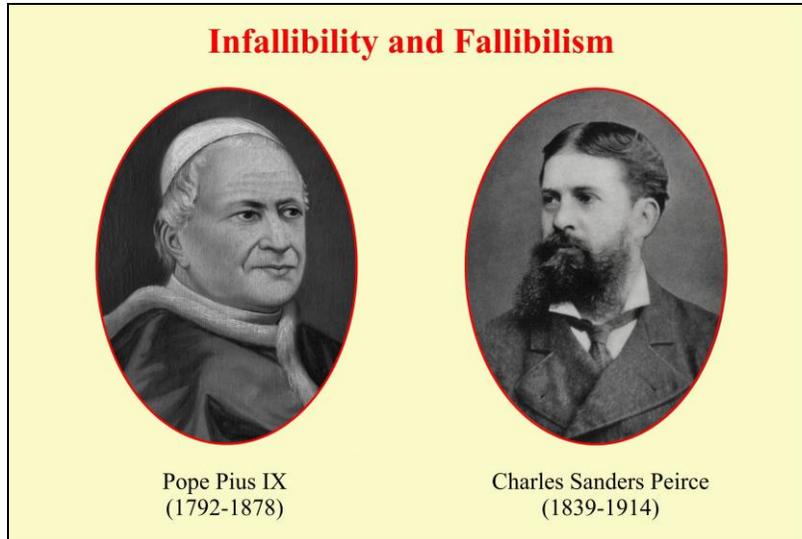
Science has its basic beliefs. These must be accepted on faith since they cannot be demonstrated by its own methods. As well as basic beliefs, science also shares with religion many other characteristics. It has its scriptures (published articles), its prophets (Galileo, Newton, Einstein) and its martyrs (Giordano Bruno).

Science believes that we do not live in a virtual world run by an omniscient and benevolent director as in *The Truman Show*. Rather we live in a real world run by impersonal rules. We can perceive this world through our sense organs. Though these may sometimes fail and may sometimes require training, these organs provide true data about the real world.

Other basic beliefs are

- Things and events can be measured and these measurements are verifiable
- Everything happens because it is caused by something else
- The basic building blocks of nature are generic, e.g. one electron is the same as another
- The laws underlying the real world can be expressed mathematically

The codicils to the third belief are worrisome, especially the third. However, we need not lapse into dismay that we can never know anything – “epistemic pessimism.” that we cannot know anything for sure We can justify the beliefs of science by its ability to control the world and to predict what will happen.



One of the clear distinctions between science and religion concerns certainty. Religion is based on certainty whereas science is always unsure.

During the papacy of Pius IX, the First Vatican Council (1869–1870) accepted as dogma the principle of papal infallibility. This is limited to statements made by the pope when speaking *ex cathedra*. The only time that papal infallibility has been invoked since then was in 1950 when the *Assumption of Mary* was defined as an article of faith. However, previous papal proclamations, such as that concerning the *Immaculate Conception* in 1854, were retrospectively considered *ex cathedra*. Pope Pius IX was the longest reigning pope (1846-1878) in the history of the Roman Catholic Church.

At the same time as the church was promoting papal infallibility, the American philosopher C. S. Peirce was describing how science was based on fallibilism. A scientific statement is one that can be proven false by observation or experiment. Peirce was the founder of Pragmatism.

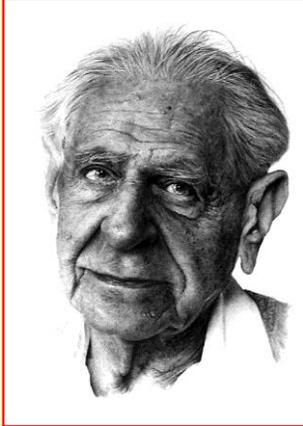
Humanum est erare

According to Peirce, all human knowledge is uncertain:

Fallibilism is the doctrine that our knowledge is never absolute but always swims, as it were, in a continuum of uncertainty and of indeterminacy (1897).

Karl Popper extended this idea to state that science is composed of falsifiable statements that have not yet been falsified when tested:

It must be possible for an empirical scientific system to be refuted by experience (1959)



Karl Popper (1902-1994)
drawing by John Wieser

The full Latin quote is *Humanum est errare perservare diabolicum*. (To err is human; to persist in error is diabolical.) As soon as you realize that you have made a mistake you should change!

Popper considered theories that cannot be tested as unscientific. This approach to science accepts that our theories change over time. Indeed, the history of science is full of theories that have been discarded. One of the most famous is the theory of phlogiston – the explanation of combustion (Greek, *phlox* flame).



Phlogiston and Oxygen

Johann Joachim Becher (1635-1682) proposed that any combustible or rustable material contained phlogiston. Burning or rusting released the phlogiston into the air, leaving a dephlogisticated part (ash or calc).

Antoine Lavoisier (1743 -1794) pointed out that since rusting metals gained mass phlogiston must have negative mass. This was impossible. He therefore proposed that burning or rusting involved the combination of the material with “oxygen.” Burning wood gave carbon dioxide gas and rusting metals formed solid metallic oxides.

When wood burns the carbon in it forms carbon dioxide and carbon monoxide, and the other elements form ash – calcium carbonate, potassium carbonate, oxides of iron and other metals. The gases escape and the ash weighs only about 1% than the original. So it was natural to think that something had been released. Scientists then considered the rusting of metals. This seemed to be the same type of process as the burning of wood but much slower. However, rusting metals gain weight. This is due to the formation of metallic oxides.

The gorgeous photograph of rusted iron from Wikipedia

https://upload.wikimedia.org/wikipedia/commons/thumb/a/a4/Rust_on_iron.jpg/1280px-Rust_on_iron.jpg

The discovery of oxygen and the concept of phlogiston are considered in the 2001 play *Oxygen* by Carl Djerassi and Roald Hoffmann.



Convergent Realism

As science progresses, our theories will be revised so that they more and more closely represent the external world. Finally we shall have a theory of everything.

Pessimistic Induction

If past scientific theories, which successfully explained our observations, were later found to be false, we have no reason to believe that our currently successful theories are even approximately true.

The illustration of the *Last Judgment* is part of a diptych by Jan Van Eyck from about 1440. It is used to suggest the heaven or hell at the end of the scientific endeavor.

Convergent realism also goes by the name of epistemic optimism (hope that we ultimately can know everything).

Pessimistic Induction was first proposed by Larry Laudan in a paper from 1981:
https://philosophy.hku.hk/courses/dm/phil2130/AConfutationOfConvergentRealism2_Laudan.pdf

One usually counters Laudan by the fact that present theories work in terms of prediction and control. However, this does not mean that they accurately represent the world.

You have to decide who you are – a convergent realist or an inductive pessimist. Are you Big Bird or Oscar the Grouch, Winnie the Pooh or Eeyore? Me I don't think we shall ever have a theory of everything, but that's no reason to give up trying.

Theories of Truth

Let **P** be a proposition such as “God exists”
or “The sun goes round the earth”
or “I have two hands”

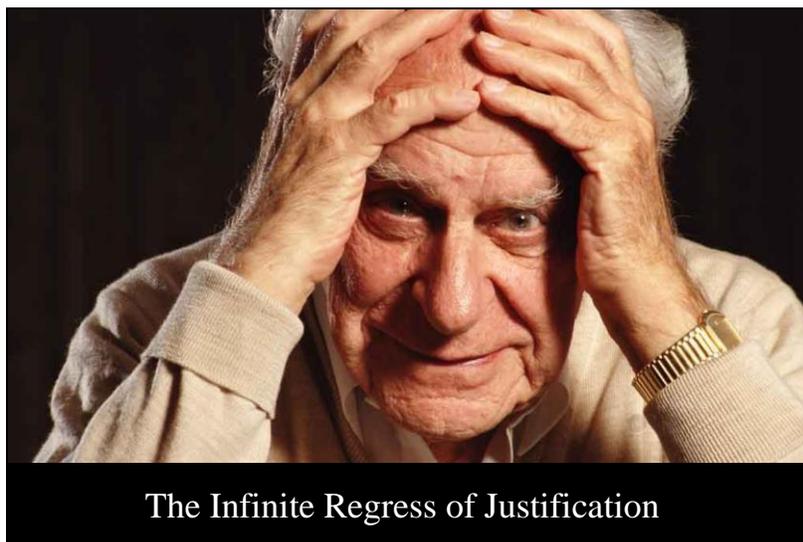
Correspondence Theory – **P** is true if it corresponds with or is identical to the facts (the way things are in the real world).

Coherence Theory – **P** is true if it is part of a coherent system of beliefs (a world view).

Pragmatist Theory – **P** is true if it satisfactorily predicts future experience and thus serves as a basis for action.

Most people tend to be realists (i.e. they believe in a real world outside of our ideas thereof) and have a correspondence theory of truth. Many scientists are aware, however, that we are uncertain about the exact correspondence and must work with the best version that we can get. This is pragmatism.

“There is no doubt that correspondence to the facts is what we usually call 'truth'; that in ordinary language it is correspondence that we call 'truth', rather than coherence or pragmatic usefulness. A judge who admonishes a witness to speak the truth and nothing but the truth does not admonish the witness to speak what he thinks is useful either for himself or for anybody else. The judge admonishes a witness to speak the truth and nothing but the truth but he does not say, 'All we require of you is that you do not get involved in contradictions', which he would say were he a believer in the coherence theory. But this is not what he demands of the witness.” Popper (1966).



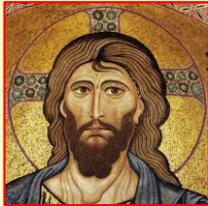
The next time you are at a cocktail party and you are bored with talk of Trump, you can bemoan the infinite regress of justification:

The problem with our concept of truth is that it is often impossible to determine whether something is true. We may be certain that $2 + 2 = 4$ is true but this actually depends on the accepted axioms of our system of arithmetic. This problem is more clearly seen in geometry than in arithmetic. The proposition that “Parallel lines never meet when extended” is true for Euclidean geometry but not for other geometric systems.

When we consider the natural world truth becomes even more difficult to determine. A particular proposition about the world such as “The earth goes round the sun” depends on the truth of multiple astronomical observations, which themselves depend on the truth of our instruments in making these observations and the truth of our sensations in recording these observations. This “infinite regress of justification” convinced Karl Popper to stop using the concept of “truth.”

Other philosophers, such as Evandro Agazzi, have suggested that we use the term “objectivity” instead of “truth.” Knowledge is objective if it is independent of the knowing subject, i.e. it faithfully represents the object as it exists independently of the perceiving subject.

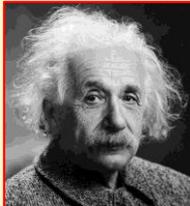
Truth



I am the way, the truth,
and the life (John 14:6)
The truth shall make
you free (John 8:32)



"Beauty is truth, truth beauty," – that is all
Ye know on earth, and all ye need to know.
John Keats *Ode on a Grecian Urn* (1819)



Truth is what stands
the test of experience.
Einstein (1950)

Knowledge, Truth and Belief

Most philosophers conceive of knowledge in terms **justified true belief**.

For a subject **S** to know **P**, the following three conditions must be met:

- S** believes **P**
- S** is justified in believing **P**
- P** is true

The crucial step is justification. This should be based on factual evidence. However, it could also be based on how well **P** fits with other beliefs or how well **P** provides a basis for action.

Belief is emotional:

Belief may be no more, in the end, than a source of energy, like a battery which one clips into an idea to make it run. (J. M. Coetzee, *Elizabeth Costello*, 2003)

The final condition for justified true belief is that the proposition is actually true. This is necessary because of false belief. Many years ago, we may have believed that the earth was flat, and we could cite reasons to justify this belief. However, we did not “know” that the earth was flat, because it was actually spherical. We only thought we knew.

There are three types of knowledge: knowledge by acquaintance, knowledge about something, and knowledge how to do something. In English we denote the first two by the verb “know” and the last by the modal verb “can”. In French the first is “connaître,” the second and third are “savoir.”

I know Paul. I know that Paris is the capital of France. I can speak French.

Je connais Paul. Je sais que Paris est le capitale de la France. Je sais parler Anglais

In this discussion we are considering knowledge in the second sense.

Faith is belief in something that cannot be scientifically demonstrated. It is perhaps more concerned with trust and allegiance than belief. Thus we have expressions like “keep the faith.”

Truthiness

a word invented by Stephen Colbert in 2005 to describe

the belief in what you feel to be true rather than what the facts will support



“You don't look up truthiness in a book, you look it up in your gut.”

The problem of knowledge is that beliefs are easily affected by emotions. And our emotions are highly involved in what we already believe. Something that goes against all that we believe in is much more difficult to accept as true than something that fits easily within our world view. Something that does not fit leads to cognitive dissonance – the anxiety we feel we have when we entertain ideas that contradict what we believe.

Some comments by Hannah Arendt (*Truth and Politics*, 1967) on truth and opinion: Facts inform opinions, and opinions, inspired by different interests and passions, can differ widely and still be legitimate as long as they respect factual truth. Freedom of opinion is a farce unless factual opinion is guaranteed and the facts themselves are not in dispute. In other words factual truth informs political thought just as rational truth informs philosophical speculation.



This is from the first episode of the Stephen Colbert Show in 2005. Harriet Miers was a friend and colleague of George W Bush. In 2005, he nominated her for the US Supreme Court despite the fact that she had no previous experience as a judge. She ultimately asked that her nomination be withdrawn.

The word “post-truth” was considered the word of the year in 2016 by the Oxford English Dictionary. It is an adjective used to denote a state of affairs: “relating to or denoting circumstances in which objective facts are less influential in shaping public opinion than appeals to emotion and personal belief”
e.g. the post-truth world, post-truth politics

Colbert was rightfully upset that the OED made no mention truthiness in its presentation of post-truth, although Merriam-Webster had made “truthiness” its word of the year in 2006. The OED defines truthiness as “quality of appearing to be true while not actually or necessarily being so” (which is not how Colbert defined it).



Sean Spicer’s initial press conference wherein he falsely claimed that Trump’s inauguration had drawn the largest audience to ever witness a presidential inauguration. The next day Trump’s counselor Kellyanne Conway told Chuck Todd on the NBC program *Meet the Press* that Spicer had presented “alternative” facts.” In *Trump: the Art of the Deal* the term “truthful hyperbole” (coined by Trump’s co-author Tony Schwarz) was used to describe an innocent form of exaggeration when something is being promoted.

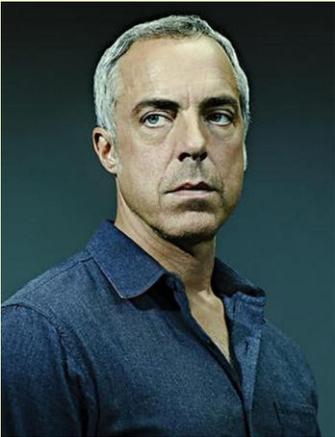
<https://www.youtube.com/watch?v=VSrEEDQgFc8>

Chuck Todd said “Alternative facts are not facts. They’re falsehoods.” He was being gentle. They are lies

Two Kinds of Truth

He knew that there were two kinds of truth in this world. The truth that was the unalterable bedrock of one’s life and mission. And the other, malleable truth of politicians, charlatans, corrupt lawyers and their clients, bent and molded to serve whatever purpose was at hand.

Michael Connelly, 2017



Titus Welliver as Detective
Harry Bosch

Bosch knows that what he remembers is true, and that the others are making things up.



So how do science and religion get along? This ceiling fresco in the Seitenstetten Monastery in Austria was painted in 1735 by Paul Troger to show the *Harmony between Religion and Science*.

Religion and Science are in the center. On the right are the various divisions of science. To the left of religion are the virtues – piety, chastity, and the most important: faith, hope and charity. To the far right the Angel of God drives away the seven deadly sins. In the fresco, the meaning of “science” is knowledge, and even that is more related to the humanities than to what we would nowadays consider science. The fresco does not represent physics, chemistry or biology. There has been little harmony between religion and science since the 1633 trial of Galileo.

Interactions between Science and Religion

Explanation – science seeks the natural laws that underlie all phenomena, even those as yet only understood in terms of religion

Conflict – science attempts to defeat the forces of ignorance that hold onto power by convincing people to believe what is not true

Dialogue – science and religion work together to understand creation, fitting observation to revelation, supplementing scripture with experiment

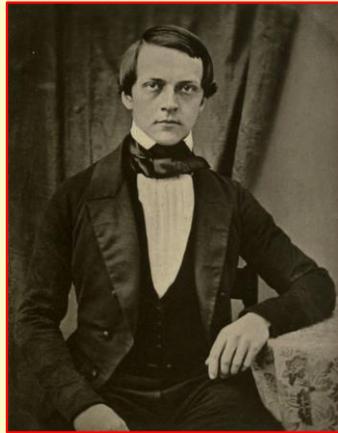
Independence – science and religion are separate domains of knowledge, one dealing with the natural world and the other with human morality

Integration – science is a way of understanding God and the purposes of his/her creation

These types of interaction overlap to some degree. The idea of explanation shares aspects with both conflict and independence. Dialogue can obviously lead to integration.

Ian Barbour (*When Science Meets Religion: Enemies, Strangers, or Partners?* 2000) distinguished 4 types of interaction: conflict, independence, dialogue, and integration. I have added explanation.

We shall go through examples of these interactions. See which one is most like you? An explainer, a warrior, a talker, a separatist, a pantheist?



Hermann von Helmholtz
(1821-1894) 1848 daguerreotype

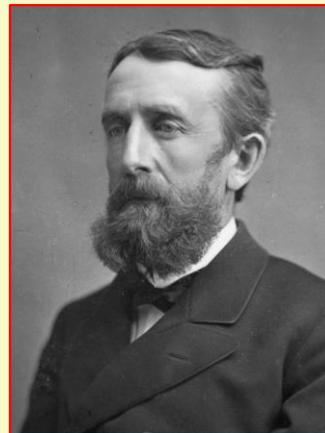
On the Conservation of Force (1847)

The final aim of the theoretic natural sciences is therefore to discover the ultimate and unchangeable causes of natural phenomena ... it is at all events clear that the science whose object it is to comprehend nature must proceed from the assumption that it is comprehensible, and in accordance with this assumption investigate and conclude until, perhaps, she is at length admonished by irrefragable facts that there are limits beyond which she cannot proceed.

This quotes from the introduction to Helmholtz's paper on *The Conservation of Force*, now known as the conservation of energy. It is an example of science's desire to explain everything. One gets the feeling from Helmholtz that science will never reach the limits that he suggests might exist.

A History of the Warfare of Science with Theology in Christendom (1896)

In all modern history, interference with science in the supposed interest of religion, no matter how conscientious such interference may have been, has resulted in the direst evils both to religion and to science, and invariably; and, on the other hand, all untrammelled scientific investigation, no matter how dangerous to religion some of its stages may have seemed for the time to be, has invariably resulted in the highest good both of religion and of science. (p viii)



Andrew Dickson White
1832-1918

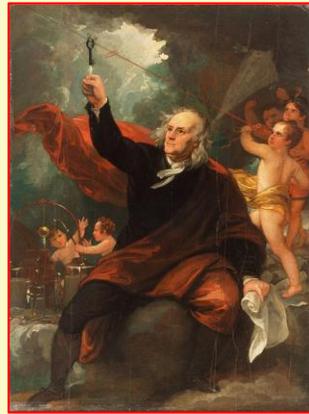
The idea that science was in direct conflict with religion was initially stated in the book *History of the Conflict Between Religion and Science* (1874) by John William Draper. Draper was a chemist, physician and historian. The book was more of a diatribe against religion than a study of science. Draper was also famous for his history of the American Civil War and for taking the first daguerreotype of the moon.

Andrew Dickson White, a politician and historian, extended Draper's ideas. Together with Ezra Cornell, White founded Cornell University in 1865 and became its first president. He wanted universities to have no religious affiliation. His two-volume book describe the relations between science and theology as "warfare" rather than "conflict." White's books contained numerous examples. However, he exaggerated the differences between science and religion and did not distinguish between religion and superstition.

Kites and Keys and Lightning Rods

Benjamin Franklin's experiments on atmospheric electricity (1747-50) led him to recommend the use of lightning rods on tall buildings. The idea was to provide a low-resistance pathway for excess atmospheric electricity to be drained to ground, or for an actual lightning strike to reach ground.

A. D. White was particularly critical of churches who refused to put lightning rods on their church steeples, since they believed that lightning was controlled by God. However, many churches began to use lightning rods soon after Franklin's reports.



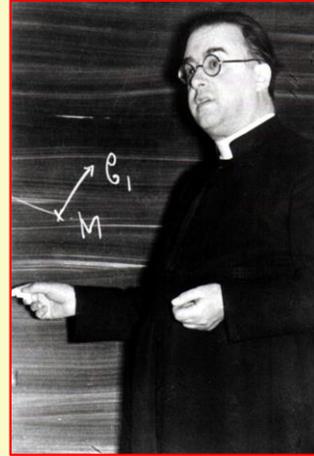
*Benjamin Franklin Drawing
Electricity from the Sky*
Benjamin West, 1816

The idea of lightning rods is one of the examples that White used to show the recalcitrance of religion in the face of scientific advances. However, although some refused, most churches rapidly applied lightning rods to their steeples.

The painting shows one of Franklin's experiments. It falsely suggests that the scientist tapped a lightning strike. Actually, he flew his kite when there was no actual lightning. Furthermore, he kept himself dry under a roof. The advice to those who wish to replicate his results is "Do not do this!"

The beginning of the world from the point of view of quantum theory (1931).

Clearly the initial quantum could not conceal in itself the whole course of evolution; but, according to the principle of indeterminacy, that is not necessary. Our world is now understood to be a world wherein something really happens; the whole story of the world need not have been written down in the first quantum like a song on the disc of a phonograph. The whole matter of the world must have been present at the beginning but the story it has to tell may be written step by step.



Georges Lemaître (1894-1966)

This is a primary example of the dialogue between religion and science. Lemaître, a Catholic priest, first described the idea of the Big Bang theory of the origin of the universe. He considered the initiation of the universe as an “initial quantum.” He was triggered to study the expansion of the universe by his reading of the book of *Genesis*. That the universe was divinely created out of nothing (*ex nihilo*) is an essential part of the Judeo-Christian doctrine.

Interestingly, in this quotation he tries to reconcile the ideas of determinism and free will. He is saying the everything that would happen was not determined at the beginning. The story of the universe tells itself step by step. We shall discuss determinism and free will in a later session.



Stephen Jay Gould (1941-2002)

Non-Overlapping Magisteria

The net, or magisterium, of science covers the empirical realm: what is the universe made of (fact) and why does it work this way (theory). The magisterium of religion extends over questions of ultimate meaning and moral value. These two magisteria do not overlap, nor do they encompass all inquiry (consider, for example the magisterium of art and the meaning of beauty). To cite the old clichés, science gets the age of rocks, and religion the rock of ages; science studies how the heavens go, religion how to go to heaven. (*Rocks of Ages*, 1999)

This is an example of the independence of science and religion: science deals with the real world (what is) and religion deals with morality (what should be).

Stephen Jay Gould was a paleontologist, an evolutionary scientist and a noted essayist. He wrote about such disparate things as the fossils of the Burgess Shale, the frescoes of San Marco, baseball statistics, intelligence testing, and the Panda's thumb.

When Gould attributes "how the heavens go" to science and "how to go to heaven" to religion, he is quoting Galileo, who was himself quoting Cardinal Cesare Baronio (1538-1607), an ecclesiastic historian.

Psychologists and sociologists might question Gould's relegation of morality to religion. Should not moral behavior be considered scientifically?



**The Language of God
(2006)**

The God of the Bible is also the God of the genome. He can be worshipped in the cathedral or in the laboratory. His creation is majestic, awesome, intricate, and beautiful – and it cannot be at war with itself. Only we imperfect humans can start such battles. And only we can end them.

Francis Collins (1950 -)

This is perhaps an example of the integration of science and religion. Collins led the Human Genome Project from 1993-2008 and has been head of the National Institutes of Health since 2009. He is a devout Christian. He promotes a fusion of Christianity and Biology in a movement called *BioLogos*:

<http://biologos.org/about-us/>

Collins presents a version of process theology. This was first described by Alfred North Whitehead in *Process and Reality* (1929)

https://monoskop.org/File:Whitehead_Alfred_North_Process_and_Reality_corr_ed_1978.pdf

A more recent advocate of a similar approach is Arthur Peacocke in *Theology for a Scientific Age* (1993).

The idea is that God and the Universe are intimately related. Process theology proposes that God is the universe becoming itself. To study the laws of science is to understand the mind of God. This is basically a type of "pantheism." Process theology provides a way of reconciling the existence of God with the presence of suffering. If God and the universe are in the process of becoming, evil and suffering are present to the extent that this process is as yet incomplete.

So what are you?

An explainer, a warrior, a talker, a separatist, a pantheist?

Me: I'm an explainer with some tendency to pantheism

Stories

Martin: What would we do here?
 Eddie: Well, you could, uh – tell each other stories.
 Martin: Stories?
 Eddie: Yeah
 Martin: I don't know any stories.
 Eddie: Make 'em up.
 Martin: That's be lying wouldn't it?
 Eddie: No, no. Lying's when you believe it's true. If you already know it's a lie, then it's not lying.

Fool for Love, Sam Shepard, 1983



Soulpepper, Daniel Bejar

In Eddie's final comment the "you" refers to the listener.

We understand the world we live in by telling stories. Some of these become the foundations of religious belief; some are linked together into scientific theories.

Some of our stories are true and some are fiction. Fiction can, however, be true to life. Perhaps we can look at truth from the point of view of fiction

Metaphor

Stating that something
is what it is not



But soft! What light through yonder window breaks?
 It is the east, and Juliet is the sun.
 Arise, fair sun, and kill the envious moon,
 Who is already sick and pale with grief,
 That thou, her maid, art far more fair than she.
 Be not her maid since she is envious.
 Her vestal livery is but sick and green,
 And none but fools do wear it. Cast it off!
 It is my lady. O, it is my love!

Olivia Hussey
1968

Ian McKellan, 1977



Statements like “The genome is the language of God” are metaphorical. Metaphor is stating that something is what it is not, thereby attributing new features to that something. Juliet is not the sun but Romeo attributes to her the sun’s brilliance and majesty. The moon is not the envious maid of the sun, but it does share the maid’s lack of beauty compared to her mistress.

Sal Tlay Ka Siti

My mama once told me of a place
 With waterfalls and unicorns flying
 Where there was no suffering, no pain
 Where there was laughter instead of dying
 I always thought she’d made it up
 To comfort me in times of pain
 But now I know that place is real
 Now I know its name
 Sal Tlay Ka Siti



“Sal Tlay Ka Siti isn’t an actual PLACE...It’s an IDEA. A metaphor.”



Nikki M. James

Religious scripture is full of metaphor.

This idea is considered in the 2011 musical *The Book of Mormon*. In the musical the fantastical stories of the actual Book of Mormon are further garbled by Elder Cunningham who is trying to convert Ugandans to Mormonism. One of the converts Nabulungi comes to believe that Heaven is Salt Lake City. As the musical progresses, she realizes that this is not true – it is just a metaphor. But the ideas behind the metaphor may be true or may be worth believing in?

Not just a story mama told
 But a village in Ooh-Tah
 Where the roofs are thatched with gold
 If I could let myself believe
 I know just where I’d be
 Right on the next bus to paradise
 Sal Tlay Ka Siti
 I can imagine what it must be like
 This perfect, happy place
 I’ll bet the goat-meat there is plentiful
 And they have vitamin injections by the case
 The war-lords there are friendly
 They help you cross the street
 And there’s a Red Cross on every corner
 With all the flour you can eat
 Sal Tlay Ka Siti

The most perfect place on Earth
 The flies don't bite your eyeballs
 And human life has worth
 It isn't a place of fairytales
 It's as real as it can be
 A land where evil doesn't exist
 Sal Tlay Ka Siti
 And I'll bet the people are open minded
 And don't care who you've been
 And all I hope is that when I find it
 I'm able to fit in
 Will I fit in?
 Sal Tlay Ka Siti
 A land of hope and joy
 And if I want to get there
 I just have to follow that white boy
 You were right, mama
 You didn't lie
 The place is real
 And I'm gonna fly
 I'm on my way
 Soon life won't be so shitty
 Now salvation has a name
 Sal Tlay Ka Siti



Portrait by Piotr Sokolov, 1836

Alexander Pushkin (1799-1837)

Pushkin came from a noble Russian family. His great grandfather was an African, who was raised in the court of Peter the Great, and who became a general. Pushkin became a prolific poet and playwright. His most famous work is *Eugene Onegin* (1833), a novel in verse.

Pushkin died in a duel with Georges d'Anthès, who had been carrying on an affair with Pushkin's wife.

In order to consider the concepts of knowledge, truth and belief, more fully I shall look at the relation between truth and fiction. As an example I shall look at the life of Alexander Pushkin and at the story told in his poem *Eugene Onegin*.



This 1869 painting by Adrian Volkov depicts the 1837 duel between Pushkin and d'Anthès. Pushkin had challenged d'Anthès.

The duel was carried out according to conventional rules. The antagonists were separated by 20 paces. They could advance toward each other until they reached markers separated by ten paces. They could shoot at any time. Each person was allowed one shot.

d'Anthès took the first shot and severely wounded Pushkin in the abdomen. Pushkin then insisted on taking his shot. Pushkin died two days later of peritonitis. His shot had hit d'Anthès in the forearm, but the wound was only superficial.



Pushkin's real duel with d'Anthès was presaged by the fictional duel that occurred in his poem *Eugene Onegin*. In this poem Onegin (played by Ralph Fiennes) offended his friend Vladimir Lensky (played by Toby Stephens) by flirting with his fiancée. The young woman who watches

the fateful duel is Tatyana (played by Liv Tyler). She had expressed her love to Onegin, but had been rejected. The clip is from the 1999 movie.

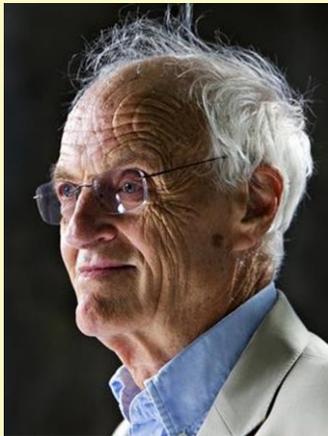
So we can consider some questions:

1. Is it true that Onegin shot and killed Lensky?
2. Is it true that Lensky shot first?

In Pushkin's poem, Onegin did indeed shoot and kill Lensky. Both duelists raise their pistols together but Onegin shot first, killing Lensky. The opera and the ballet follow the poem. In the movie, Lensky shot first and missed.

Is it True about Lensky?

If fictitious statements *do* express propositions, though, and these propositions are by definition not true, then it seems to leave no alternative in logic but to classify them as false. But if the proposition expressed by the statement 'Onegin shot Lensky' is false, even though, in Pushkin's poem Onegin *did* shoot Lensky, then it can't be distinguished from 'Lensky shot Onegin,' even though, in the poem, he *didn't*. (*The Human Touch*, 2006)



Michael Frayn (1933 -)

Michael Frayn is an English playwright (*Noises Off*, 1982; *Copenhagen*, 1998) and novelist (*Headlong*, 1999). However he did study moral philosophy at Cambridge and has written a book of philosophical essays (*The Human Touch*). One of these essays deals with how we consider fictitious statements.

Is the proposition "Onegin shot Lensky" true or false?

Samuel Taylor Coleridge coined the term "suspension of disbelief" in 1817 for how we understand works of fiction. Thus we can consider the proposition true in the context of the poem. Indeed, we can also state that a work of fiction is "true to life."

"Lensky shot first" is true in the context of the movie. However, it is not true in the context of the original poem.

Religious scripture was created by human beings. We can consider statements in scripture as true in the context of the rest of scripture, even though such events may not have actually happened.

Transcendental Knowledge

Classical Greek philosophy, particularly that of Plato, described various higher aspects of being, such as truth and beauty, as the perfect forms.

These ideas may have originated in Eastern religions. The *Bhagavad Gita* (17:15) urges speech that is “truthful, agreeable and beneficial.”

In a 1496 commentary on Plato, Marsilio Ficino identified three transcendentals: **truth**, **goodness** and **beauty**.



Krishna instructs Arjuna
in the *Bhagavad Gita*
(Statue in Nusa Dua, Bali)

The code of honor is one of the ways in which human beings strive to do the right thing. Such codes should perhaps be in the domain of religion rather than science. One can consider knowledge to be of two kinds – that related to the natural world and that related to transcendental ideas such as truth, goodness and beauty.

The *Bhagavad Gita* (“Song of the Lord”) probably dates back to the 5th century BCE although it may not have reached its final written form until later. It is part of the larger epic *Mahabharata*. Before the great battle of Kurukshetra, the hero Arjuna is visited by Krishna who teaches him what he should do and why.

Christian thought considers God to be the ultimate union of truth, goodness and beauty. But perhaps these abstract ideas are not necessarily religious. Perhaps they are the goals of science, ethics and aesthetics, fields that can be explored by reason instead of revelation.



The code of honor that led to duels is one of the abstractions that have governed human (particularly male human) behavior. Its rules of behavior were set out by reason rather than religion. One might even say that dueling was a science. The religious commandment not to kill would invalidate the rules of this code of honor. Perhaps revelation is a better guide to what to do than reason?

It is worth considering the code of honor briefly from the point of view of Shakespeare's Falstaff. The clip is from Orson Welles' 1965 film *The Chimes at Midnight*.

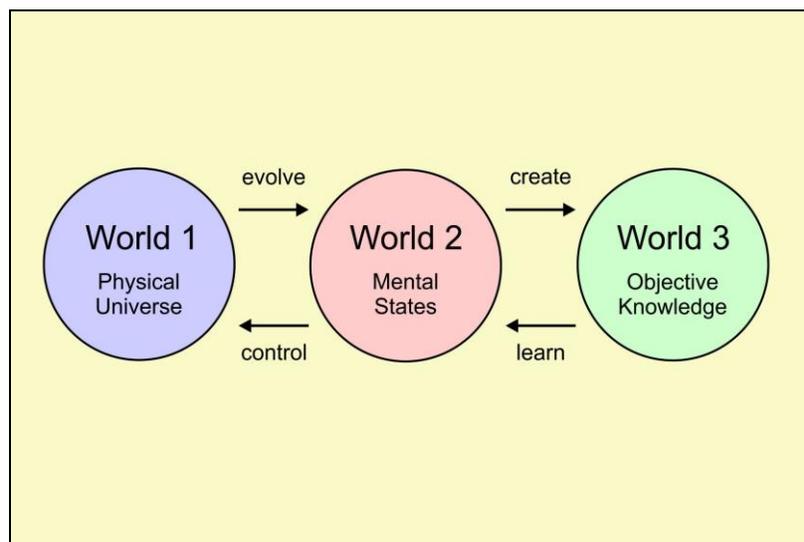
Henry IV Part I Act V Scene 1

FALSTAFF Would 'twere bed-time, Hal, and all well.

PRINCE HENRY Why, thou owest God a death.

FALSTAFF 'Tis not due yet; I would be loath to pay him before his day. What need I be so forward with him that calls not on me? Well, 'tis no matter; honour pricks me on. Yea, but how if honour prick me off when I come on? how then? Can honour set to a leg? no: or an arm? no: or take away the grief of a wound? no. Honour hath no skill in surgery, then? no. What is honour? a word. What is in that word honour? what is that honour? air. A trim reckoning! Who hath it? he that died o' Wednesday. Doth he feel it? no. Doth he hear it? no. 'Tis insensible, then. Yea, to the dead. But will it not live with the living? no. Why? detraction will not suffer it. Therefore I'll none of it. Honour is a mere scutcheon: and so ends my catechism.

(Orson Welles as Falstaff and Keith Baxter as Hal)



Popper described science as a critical and creative art. Theories cannot be fully proven by finding corroborative evidence. However they can be disproven by finding evidence that refutes them. The scientist evaluates our present theories through observation and experiment. When a theory fails to account for experience, a new hypothesis is then proposed that it able to account for a greater range of experience. This is then tested experimentally.

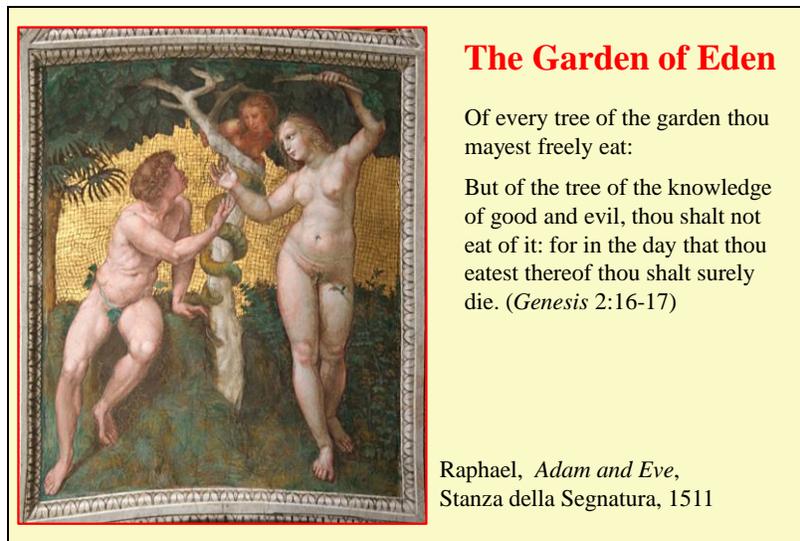
The crucial part of science resides in creating hypotheses that can stand the test of experiment.

The philosopher Karl Popper and the neurophysiologist John Eccles proposed three “worlds” in their 1977 book *The Self and Its Brain*.

World 1 is the real world. It includes the brain.

World 2 is consciousness. It evolves from the real world as an emergent property of the brain. They propose that this is mainly due to the development of language and logic in the left hemisphere of the cerebral cortex.

World 3 is the accumulated cultural knowledge. This is what we contribute to when we propose theories and create works of art. This is what we learn from when we go to school.



We end this session with the great paradox in the story of the Garden of Eden. The original sin of Adam and Eve was to disobey God’s command not to eat of the Tree of Knowledge. Yet the pursuit of knowledge, particularly the knowledge of good and evil, is the goal of the rest of Judeo-Christian scripture.

In the *Genesis* version the Serpent was the Seducer. In the Gnostic (*gnosis*, knowledge) scriptures, the serpent was the instructor.

And the serpent said unto the woman, Ye shall not surely die:
For God doth know that in the day ye eat thereof, then your eyes shall be opened, and ye shall be as gods, knowing good and evil.

And when the woman saw that the tree was good for food, and that it was pleasant to the eyes, and a tree to be desired to make one wise, she took of the fruit thereof, and did eat, and gave also unto her husband with her; and he did eat.

(Genesis 3: 4-6)

Raphael's painting was on the cover of Stephen Jay Gould's *Rocks of Ages*, 1999



Raphael's *Adam and Eve* was painted on the ceiling of the Stanza della Segnatura in the Vatican. On the wall is the famous fresco *The School of Athens* (1511), of which this slide shows the central part. Plato holds his book *Timaeus* and points to heaven. Aristotle holds his *Ethics* and holds his hand out over the world. The transcendental and the natural. On the steps is Diogenes the Cynic, he who believed in nothing.