

## 0.1 Introduction

The topic today is reason, and its relationship to knowledge. We'll consider what we mean by truth and knowledge, and catalog and examine the competing ways people have claimed to arrive at them. In the context of freethinking and skepticism, I'd like to approach this matter with an emphasis on the fundamental differences between faith and reason as paths to truth and knowledge.

We'll look at the history of the emergence of the modern rational skeptical approach with its requirement for supporting physical evidence, and its struggle against faith based systems even today.

Finally, we'll consider the proper forms logic takes, as well as logical fallacies. We'll consider the difference between dialectic - the cooperative activity characteristic of academia, which goal is to seek truth - and sophistic argumentation - where the purpose is to persuade, as with political ideologies, religious systems, and advertising.

The theme will be that scientific skepticism - "the practice of questioning whether claims are supported by empirical research and have reproducibility." - has been one of the greatest ideas humanity has ever conceived, comparable to such greats as justice and guaranteed personal freedoms. Scientific skepticism combines skepticism, the idea that all claims should be questioned, with rationalism, the idea that reason is a path to knowledge, and empiricism - the idea that knowledge is derived from sense-experience, that is, by observing and experiencing nature, and looking to nature to confirm or disconfirm hypotheses.

Thales to Galileo: rational skeptical philosophy to empirical science

In the West, rational skepticism was first introduced by the ancient Greek philosophers, whose skepticism about the claims that natural events were punishments from capricious gods led to free speculation about reality. Thales (624 BC - 546 BC) suggested that everything was a form of water, which was the only substance he knew of capable of existing as solid, liquid and gas. What is significant was his willingness to try to explain the workings of nature without invoking the supernatural or appealing to the ancients and their dicta. The more profound implication was that man might be capable of understanding nature, which might operate according to comprehensible rules that he might discover.

The questioning of dogma and the application of reason was a huge leap forward. But rational skepticism without empiricism, which is the appeal to reality as the arbiter of truth, is as sterile as religion. The pronouncements of Aristotle, such as the one that heavier objects fall faster than lighter ones, were also taken on faith, and were not tested with actual heavy and light objects until the time of Galileo, who added the element of empiricism to the matter. Galileo was therefore not just a rationalist and philosopher like Thales or Aristotle, but an early scientist.

Thus we see that truth is not a function of reason alone, but of reason applied to experience, which in the sciences is usually called observation, experimentation, data collection, hypothesis testing, and the like.

## 0.2 Truth, fact, and knowledge

Let's begin by considering what we mean by truth, fact, and knowledge. What are they? I would define them like this: Truth is the quality that facts possess, with facts being defined as linguistic strings that accurately map a portion of reality. A fact therefore allows us to make an accurate prediction of how we will experience reality under certain circumstances. This is information that allows us to explain, predict, and at other times control our physical reality. Knowledge is a collection of facts

Here's an example of a fact – one that borrows from the map metaphor almost literally: If you travel south from the carretera on Colon, you will pass the Ajijic plaza on your left, and can proceed a few blocks further until you reach the pier and the lake, at which point you can turn right and walk the malecon. This linguistic string captures some of the geometry of the streets and other structures in the village, that is, it accurately depicts a small piece of physical reality. It allows you and me to predict what will happen if we walk south on that part of Colon.

Like other facts, it allows us to manipulate ourselves or our environment to control experience. If we choose to walk the malecon when standing on the corner of Colon and the carretera, knowing this fact allows us to be on the malecon in a few minutes.

If we modify the linguistic stream, as by changing south to north or right to left, we have an erroneous statement, a non-fact, false knowledge, and a non-truth. If we choose our path based on this information – this map – we will not accomplish our goal.

## 0.3 Pure reason, syllogism, and dialectic

**Pure reason** gave us mathematics and formal logic, which is best known through **syllogism**: If all men are mortal, and Socrates is a man, then Socrates must be mortal. This is mathematical in a sense. If C, Socrates, is contained in B, the set of all men, and B, the set of all men is contained in A, the set of all mortal things, then C, Socrates, is contained in A, the set of all mortal things. This is a valid argument even all men are not mortal, and even if Socrates is not a man. The conditional syllogism, which contains words if and then, if done properly, generates a conclusion that must be true because of its form. It wouldn't matter if all men actually were mortal. The conclusion is valid because of the form of the syllogism. It is only claiming that IF all men are mortal, THEN

If we change the form slightly to All men are mortal, Socrates is a man, therefore Socrates is mortal – that is, if we remove the if-then language – we are making claims about reality that might or might not be true. Even if the form of the argument is perfect, if the premises are untrue, so is the conclusion. We say the form of an argument is **valid** whenever the conclusions are true of the premises are true, and that the argument is **sound** when we know that the premises are true.

For the arguer to convince the listener, every argument must begin with shared premises. If our premises are unshared, as would be the case one of us believes that

there is a god, but not the other, we can make no progress. We must go back as far as necessary to find our last shared premises, and work forward from there if we are to make progress together.

This is the process called **dialectic** – the cooperative effort of people of different opinions who are trying to discover truths by presenting in **good faith** that which each finds to be a compelling argument. What is meant by good faith disputation is bringing **open mindedness** to the discussion, that is, the willingness to be convinced by a compelling argument. Each party hears the other's counterarguments, and if both are acting in good faith, each is considering those counterarguments on their merit. The one who benefits most is not the one that does the convincing, but the one who has been enlightened.

Good faith disputation begins with sound premises and proceeds forward according to valid laws of logic to whatever conclusion the process leads. There is a bad faith variation that begins with an unproven premise, then reverse engineers an argument that appears to lead to what is being shown as a conclusion, but is actually an unproven premise. We can call this a **pseudo-conclusion**.

## 0.4 Ontology

The branch of philosophy called ontology considers the nature of reality – what exists – and what can exist, or possibility.

Let's define reality as the set of things that actually exist, where **existence** means persistence through a span of time in a location. Being and existence are synonymous and interchangeable. A thing is said to exist if it can at least in principle be detected, that is, if under the right circumstances, we can interact with it – if we can cause it to change, or it can change something in us or do something detectable to us. If we postulate the existence of something which cannot even in principle be detected, be affected, or be the cause of an effect in something that can be detected, we are describing something that is indistinguishable from the nonexistent.

Possibility refers to that which may or may not be the case now, in the past, and/or in the future, something that need not actually exist. There are two very distinct states that can be called possible: [1] things that are known to be possible because they are known to have happened, and [2] those called possible because it is not possible to declare them impossible yet.

## 0.5 Epistemology

Now we'll switch gears from the nature of reality back to the nature of knowledge about it.

The branch of philosophy that examines knowledge, what it is, and how we come by it, is called epistemology. The central epistemic terms analogous to reality, existence, and possibility from ontology are truth, fact, and knowledge. There are four methods claimed to be paths to knowledge.

1. As we noted, some knowledge such as mathematics and the rules of formal logic is arrived at through pure reason, which is called rational knowledge. We know that there is no such thing as a married bachelor without getting up out of our armchair to survey the marital status of others once we understand what “married” and “bachelor” mean.

One of the fundamental axioms of thought is **the law of non-contradiction**, which says that a thing cannot be two mutually exclusive things or in two mutually exclusive states at the same time. You cannot be both married and unmarried in the same sense of the word at the same time. The rationalist tradition in philosophy is best represented by the works of such giants as Descartes, Leibniz, Kant, and Spinoza. Not surprisingly, Descartes, also invented analytic geometry, and Leibniz calculus (Newton also invented calculus independent of Newton)

2. At times, we claim to know things through experience, that is experientially, or empirically – the basis of the school called **empiricism**. We know what hunger is because we have felt it. We understand what red is because we have seen it. This is private or subjective experience. We also know that when we water a seed under certain circumstances, a plant will grow, which is public knowledge. Knowledge acquired through experience is called empirical knowledge, and is roughly synonymous with evidence. The philosophical tradition of empiricism is best represented by the philosophers Berkeley, Locke and Hume.
3. At other times we claim to know things in our “bones”, that is for reasons that we cannot articulate. We just know. It just is. We call such claims intuitions, and the claim that intuition is a third path to knowledge **intuitionism**.

Instincts fit into this category. So do the axioms of the rationalistic formal system, the atomic, unprovable assumptions from which all derived theorems arise. “It just is” may seem like a shaky foundation for a theory of knowledge, but a little thought will reveal that the rationalist and empiricist traditions are founded on axiomatic intuitions as well. The syllogisms we looked about Socrates and the mathematical relationships they embody – *if  $A < B$  and  $B < C$ , then  $A < C$*  – are axiomatic truths, as is  $x + 0 = x$ .

The belief that there is an objective reality outside of our heads, is the basis of empiricism: Though an irresistible intuition, is not demonstrable or derivable from simpler truths – not from reason, nor from experience. We can’t prove or derive any of these ideas starting with more atomic ideas. We “just know” that they are correct:

Here’s a comment from Einstein: “The intellect has little to do on the road to discovery. There comes a leap in consciousness, call it intuition or what you will, the solution comes to you and you don’t know how or why.”

Thus intuitionism is the idea that the fundamental truths and principles of reason and experience are known directly by intuition. Ethical truth, which is more subjective, is also founded on ideas supported by claims no stronger

than “It’s just true.” We simply know that the highest good is the one that maximizes satisfaction and minimizes misery for the greatest number.

4. And finally, fideism, which is the claim that faith is a path to knowledge, The primary example of fideism is the religious claim that the faith in unseen gods and the authoritative nature of scripture is also a path to truth and knowledge – just like reason and experience is.

Religious speakers often invoke phrases like “transcendent truth”, “objective truth”, and “absolute truth” with the assumption that such things exist out there. We are told that there are truths inaccessible to reason and the senses, that these religious truths transcend reason and experience, and that these truths are inaccessible to man’s limited mind except through faith in revelation.

That is the belief of the religious. To the skeptic, it is reason applied to experience that is the foundation of all useful ideas thus far. This is the great divide between the traditions of faith and rational skepticism, each of which claims to be a path to truth.

## 0.6 Religious faith versus justified belief

Religious faith is unsupported and therefore unjustified certitude, that is, belief without sufficient evidentiary support, possibly even in the face of contradictory evidence. It is absolute. Logically speaking, it is equivalent to treating a hypothesis as a premise, axiom or theorem. By definition, however valid the subsequent reasoning, everything that is derived from a false belief is also false, and the argument for it unsound.

**Justified belief**, by contrast, is confidence, belief or trust based on prior experience. Its degree is commensurate with the quality and quantity of evidence in support of the belief, being more certain as supporting data mounts, but always tentative and amenable to modification pending the arrival of contradictory evidence. Justified belief is also mistakenly conflated with religious faith, as when we have faith that the car will start again tomorrow like it has the last 200 times it was tested, Clearly, belief as in gods is not the same things as the belief that the car will start again the next time it is tested just as it has the last 200 times.

## 0.7 Open mindedness and faith

I alluded to a definition of open-mindedness as the willingness to consider an argument impartially, and to be convinced if it is compelling. Faith based thinkers often accuse unbelievers of closed mindedness, but what they are calling closed mindedness is merely the unwillingness to accept as true that which has not been demonstrated. It is faith that closes the mind, and the process is called a confirmation bias. Consider these quotations:

1. The moderator in the debate between Bill Nye and Ken Ham on whether creationism is a viable scientific field of study asked, “What would change your

minds?" Scientist Bill Nye answered, "Evidence." Young Earth Creationist Ken Ham answered "Nothing. I'm a Christian." Ham then went on to add, "By definition, no apparent, perceived or claimed evidence in any field, including history and chronology, can be valid if it contradicts the scriptural record."

2. "If in some historically contingent circumstances, the evidence that I have available to me should turn against Christianity, I don't think that that controverts the witness of the Holy Spirit. In such a situation, I should regard that as simply a result of the contingent circumstances that I'm in, and that if I were to pursue this with due diligence and with time, I would discover that the evidence, if in fact I could get the correct picture, would support exactly what the witness of the Holy Spirit tells me." – William Lane Craig

## **0.8 Is faith a path to knowledge?**

I think that we can immediately rule out the claim that faith, though extolled by some as a virtue or a path to knowledge. What is faith but the willingness to believe without sufficient evidence? No method that can be invoked to support both an idea and its polar opposite can be a means of generating truth. The arbiter of truth has to be reason applied to experience. Experience will not confirm both of two conflicting possibilities. It will rule at least one of them out. Faith can advocate for either, or even both at once.

## **0.9 Evidence versus proof**

From Wiki: "Evidence, broadly construed, is anything presented in support of an assertion. This support may be strong or weak. The strongest type of evidence is that which provides direct proof of the truth of an assertion. At the other extreme is evidence that is merely consistent with an assertion but does not rule out other, contradictory assertions, as in circumstantial evidence."

As is often claimed, absence of proof is not proof of absence. But absence of expected evidence is evidence of absence. If nobody remembers seeing me at work, and my time card wasn't stamped, should I be surprised if I am not paid for the day?

## **0.10 The essential role of physical evidence in the determination of truth.**

Nothing can be said to be true that cannot be shown to be true. No statement can be said to be a fact without it being about a part of physical reality that can be experienced or has been experienced. Faith does violence to this notion of truth. It rips it from its anchor of evidence and experience, which would be a fatal blow were we to permit it.

## 0.11 AntiCitizenX defines truth

Consider this passage from on the subjects of what is real and true from an Internet persona who calls himself AnticitizenX:

“The reason why any of us believes anything at all is so that we can eventually use that information as a guide for our actions. That’s why, sooner or later, everyone has to start measuring the truth of a belief by its power to help us exercise decisions under the expectation of desirable outcomes. Decisions based on true beliefs will therefore manifest themselves in the form of controlled, predictable experiences, while decisions based on false beliefs will eventually fail in that goal. It’s a brutal, pragmatic view of truth to be sure, but it’s also the only one with any functional connection to the real world.”

“Truth has no meaning divorced from any eventual decision making process. The whole point of belief itself is to inform decisions and drive actions. Actions then influence events in the external world, and those effects lead to objective consequences. Take away any of these elements and truth immediately loses all relevance.”

“We should expect similar decisions made under similar circumstances to lead to similar outcomes. Pragmatism says that the ultimate measure of a true or false proposition lies in its capacity to produce expected results. If an idea is true, it can be used in the real world to generate predictable consequences, and different ones if that idea turned out to be false. In other words, the ultimate measure of a true proposition is the capacity to inform decisions under the expectation of desirable consequences.”

“All we need to know is that we have desires and preferences, we make decisions, and we experience sensory perceptions of outcomes. If a man has belief B that some action A will produce desired result D, if B is true, then doing A will achieve D. If A fails to achieve D, then B is false. Either you agree that truth should be measured by its capacity to inform decisions and produce results or you don’t. If you agree, then we can have a conversation. And if we disagree about some belief, we have a means to decide the issue.”

“If this is not how your epistemology works – how you define truth – then we can’t have a discussion.”

Sam Harris has said something similar:

“If someone doesn’t value evidence, what evidence are you going to provide to prove they should value it? If someone doesn’t value logic, what logical argument could you provide to show the importance of logic? Water is two parts hydrogen and one part oxygen. What if someone says, “Well, that’s not how I choose to think about water”? All we can do is appeal to scientific values. And if he doesn’t share those values, the conversation is over.”

AnticitizenX goes on to add:

“How many angels can dance on the head of a pin. No matter what answer you give, literally nothing changes. No decision you will ever make in your entire lifetime can ever be influenced by the answer to this question. If nothing changes even in principle with respect to some proposition being true or false, then the distinction between them just vanishes.”

## 0.12 Compartmentalization

Critics of faith are asked, "If faith and evidence based reasoning are antithetical as we claim, how it is possible that men of faith like Newton and Faraday made such huge contributions to man's understanding of his natural world?"

The claim by rational skeptics is that wherever they differ, faith will take you to a different place than reason applied to evidence. That is, faith based thoughts alter (in my opinion, contaminate) evidence and reason based thought wherever a faith based belief alters the path that reason applied to evidence would have taken it.

For example, the rules of addition are based in reason, and there is only one correct answer for the sum of a column of numbers. A person of faith can add numbers correctly and according to the rules of reason, but must not use a step not grounded in reason if he hopes to achieve a correct answer. That is, he can add accurately – but only insofar as his faith doesn't inform his mathematics. If he chooses to take a leap of faith not supported by the rules of arithmetic, what happens? He goes astray at that precise moment.

The answer regarding these scientists is that they were able to compartmentalize their faith and leave it outside the door when they were working. It did not and could not have affected their conclusions.

For example, living on the cusp of modernity as he did, Newton had a foot in both worlds – reason and faith based superstitions. He explored mathematics and physics as well as astrology. The math and physics, which, as I mentioned, included the invention of calculus as well as the first mathematical science, celestial mechanics, were generated without faith based ideas injected into them. That is why they worked, why we still admire Newton, and why people with no faith based ideas such as skeptical scientists can still understand them and confirm that they are accurate. They work, and are substantiated by their utility. The laws of the motions of planetary bodies unify the observations from which they were derived and allow predictions of future observations.

Newton also wrote on astrology, which was faith based, was sterile, was unsubstantiated by any evidence, unified no observations, made no valid predictions, and is ignored today. What is remarkable is that Newton was able to do both.

And stated earlier, faith allows one to claim as true whatever he likes, which is why each faith based system is different from the others, and why none of them, including nonreligious faith based systems such as astrology and phrenology, have produced any ideas of lasting value.

The method based on reason applied to evidence leads us to just one astronomy, just one physics, and just one chemistry – not multiple denominations of any of them. Each has had great practical value. As one anonymous Internet writer noted,

"Can you explain why there are several hundred thousand gods accepted by different religious people, but only one periodic table accepted by different scientists?"

## 0.13 Pseudoscience versus the Scientific Method

“Homeopaths, UFO and ESP advocates global warming denialists – all of these people look at the same evidence as we do and come to different conclusion. Why? Because there are factors other than reason at play: emotional commitment and confirmation bias. Are they irrational? Of course!” – Jerry Coyne

Earlier, I alluded to reverse engineering an argument – that is beginning with a premise, and constructing a plausible but fallacious (or specious) argument – one that appears to lead to the premise as if it were a conclusion. I called such an apparent conclusion a pseudo-conclusion.

When this process is applied to that which is being made to appear to be science, we call it **pseudo-science**. The intelligent design (ID) hypothesis is a good example: Authentic science, like authentic reason, begins with facts – data in the one case, accurate premises in the other – and proceeds forward according to valid and consistently applied rules to arrive at conclusions that are as sound as the process.

Pseudoscience, like the reverse engineered arguments, also begins with an idea that it wishes to establish as truth or fact, and selects the experiments that it is hoped will support it, eschews those that would falsify or disconfirm the desired findings, and evaluates the data with a confirmation bias. This process is radically different from science, and in the case of ID, has been as sterile as the assumptions guiding it are thought to be.

Pseudoscience also lacks the vetting mechanism of authentic science. Consider the scientific method, which now is understood to exist at two levels

The first – the method used within the laboratory (or observatory) to generate and analyze data – observation, hypothesis formation, experiment, measurement, analysis, hypothesis modification, etc. – which I call the micro-scientific method, and which results may be inaccurate and overturned, is just the beginning of the larger “macro-scientific method.” The next study may contradict the last one. What then?

Reliable science is vetted far beyond what is required by the “micro”-scientific method. Studies are subject to peer review before and after publication, where the interested scientific community can comment. The studies are often repeated and confirmed, or in some cases, disconfirmed and errors identified. The results may be used to develop technology that may be used to predict and at times control nature, which, when it happens, confirms the validity of the study. Multiple related studies are brought together to generate theories, from which previously unexpected predictions are made, which, if confirmed, further validating the findings. The theories may suggest new avenues of previously unconsidered exploration, which in turn may bear fruit – additional useful technology or suggest even more areas of investigation, further vetting the validity the discoveries. With time, additional confirming observations using unrelated techniques are added, as with Evolutionary theory, where 21st century DNA sequencing techniques arrive at the same conclusions as earlier paleontological and embryological studies. After years of such vetting, over which no contradictory observations having been made, only then is it fully vetted science. Information that gets as far as what is described above simply can't be overturned,

just expanded.

## 0.14 Logical Fallacy

[https://en.wikipedia.org/wiki/List\\_of\\_fallacies](https://en.wikipedia.org/wiki/List_of_fallacies)

<http://www.nizkor.org/features/fallacies/>

<http://www.logicalfallacies.info/>

Now we're going to look at some of the ways that reason can be misapplied or even deliberately subverted.

**Sophistry** for our purposes is defined as the deliberate manipulation of words to create a false impression using unproven premises and/or invalid arguments – logical fallacies – that appear to lead to a conclusion, but don't actually support the conclusion offered.

Or, "What makes you think that your god wants you to not bake wedding cakes for same sex couples?" "What makes me think that? Jesus. He said marriage is between a man and a woman."

Post hoc, ergo propter hoc – a Latin phrase for "after this, therefore, because of this." The term refers to a logical fallacy that because two events occurred in succession, the former event caused the latter event. Correlation does not equal causation. "Children who watch violence on TV tend to act violently when they grow up." But does television programming cause violence or do violence oriented children prefer to watch violent programs? Or perhaps a third entity is the cause of violence in children and on TV. Similar to a non sequitur, but time dependent. (e.g. She got sick after she visited China, so something in China caused her sickness.) Perhaps her sickness derived from something entirely independent from China.

Proving a negative (or non-existence) – when an arguer cannot provide the evidence for his claims, he may challenge his opponent to prove it doesn't exist (e.g., prove God doesn't exist; prove UFO's haven't visited earth, etc.). Although one may prove non-existence in special limitations, such as showing that a box does not contain certain items, one cannot prove universal or absolute non-existence, or non-existence out of ignorance. One cannot prove something that does not exist. The proof of existence must come from those who make the claims.

Red herring – argument given in response to another argument, which is irrelevant and draws attention away from the subject of argument. an irrelevant topic is presented in order to divert attention from the original issue. The basic idea is to "win" an argument by leading attention away from the argument and to another topic. Also called deflection. Consider the recent church shootings in Charleston SC. The effort was made repeatedly to deflect the discussion from guns and racism to mental illness. See also irrelevant conclusion.

Irrelevant conclusion (Ignoratio elenchi) – the informal fallacy of presenting an argument that may or may not be logically valid, but fails to address the issue in question. More colloquially, it is also known as missing the point. Maher: "If you had been born in Pakistan, you wouldn't be believing in Jesus Christ." Scarborough: "Well, Bill, that's your opinion." Whether Maher's argument is his opinion or not is irrelevant and does not address the argument made. "1984 before 1987"

Ad hominem – Latin for “to the man.” Attacking the arguer instead of the argument. “Christopher Hitchens said that what can be offered without evidence can be rejected without evidence? So what? That guy was a drunk”

Reductio ad Hitlerum (playing the Nazi card) – comparing an opponent or their argument to Hitler or Nazism in an attempt to associate a position with one that is universally reviled. See Godwin’s law)

Slippery slope: a fallacy in which it is asserted that some event Y must inevitably follow from another event X without any rational argument or demonstrable mechanism for the inevitability of the event in question.. “If we allow doctor assisted suicide, then eventually the government will control how we die.”

Special pleading – a form of fallacious argument whereby two sets of standards are applied to two separate circumstances, one called an exception, with insufficient justification for the second case deserving a separate standard. How can there be anything at all without a first cause, which must be God. What caused God? God exists outside of time, therefore always was. “You don’t get to use the science you like to invalidate the science you don’t like.”

## 0.15 Transcendence

“I have more than faith. I’ve explained that to you, but you have a closed mind that insists there’s natural proof for a supernatural being.”

What does it mean to claim that an idea transcends reason or physical reality? Some will claim that the tenets of their faith transcend reason, and that their god transcends science. If true, this would excuse such people from the burdens of demonstrating truth and reality as I have just outlined them. But is this valid? Faith doesn’t transcend reason. It sidesteps it, and insisting that the rest of argumentation needs to obey the laws of reason, but that arguments based on faith do not, is a form of a fallacy we will look at later called Special Pleading..

Calling a realm, its denizens, or its laws “supernatural” is a similar instance of trying to claim transcendence for these alleged alternate realities, that is, Special Pleading. Why should anything that exists be excluded from nature with a special label like “supernatural.” Recall that a working definition of reality was the collection of objects, spaces, and forces capable of interacting with some or all other elements of reality. If there is a god in a heaven with the power to modify aspects of our universe, then that god and its power are a part of nature that, like all of the rest of reality, is causally connected to the part of reality that we call our universe. If it can affect us, we can experience it, meaning that we can detect it. To call it real, but transcending detection, is double talk. Faith transcends reason and the supernatural transcends the natural the way criminals transcend the law.

If a religion makes a claim such as the one that prayer works, that is a scientific claim, that is, testable and if false, falsifiable.

Straw Man Fallacy – an argument based on misrepresentation of an opponent’s position; creating a false or made up scenario and then attacking it. Evolutionists think that everything came about by random chance. Most evolutionists think in terms of natural selection which may involve incidental elements, but does not

depend entirely on random chance. "Have you learned yet that 1984 is prior to 1987?"

Buck Crick wrote: Edwards v. Aguillard was rendered in 1987. ID went public as a scientific theory no later than 1984. 1984 is prior to 1987. Therefore, it is impossible that ID was motivated by a desire to circumvent Edwards.

IANS wrote: Why tell me? Did you think that I claimed that ID was "motivated by a desire to circumvent Edwards?" I claimed that it was used for that beginning in 1987. ID is at least as old as Genesis. It was motivated millennia ago by a desire to promote belief in Jehovah, who later morphed into Jehovah-Jesus.

Bandwagon fallacy: concluding that an idea has merit simply because many people believe it or practice it. Most people used to believe that the earth was flat and motionless with the sun orbiting it every day. The number of believers say nothing at all about the cause of disease.

Argumentum ad populum: An argument aimed to sway popular support by appealing to numbers rather than facts and reasons. "It's common sense" or Most of the world believes in a god"

Appeal to tradition (similar to the bandwagon fallacy): – We've always done it this way

Begging the question (petitio principii) – assuming in one's proposition that which one aims to prove: "We must encourage our youth to worship God to instill moral behavior." Assumes religion and worship actually produce moral behavior.

Circular reasoning – stating in one's proposition that which one aims to prove. "God exists because the Bible says so; the Bible exists because God influenced it."

Loaded questions – embodies an assumption that, if answered, indicates an implied agreement. "Have you stopped beating your wife yet?"

No true Christian (or No true Scotsman): an informal logical fallacy, an ad hoc attempt to retain an unreasoned assertion. When faced with an example, rather than denying it, this fallacy excludes the specific case without reference to any objective rule. Example: Many Christians in history have started wars. Reply: Well no true Christian would ever start a war. Josh Duggar wasn't Really a Christian When He Molested Those Girls"

<http://www.patheos.com/blogs/friendlyatheist/2015/05/25/ray-comfort-josh-duggar-was>

Composition fallacy – when the conclusion of an argument depends on an erroneous characteristic from parts of something to the whole or vice versa. "Humans have consciousness and human bodies and brains consist of atoms; therefore, atoms have consciousness." "Americans like hamburgers. Bob is an American, so he must like burgers." The latter also called Fallacy of division. "If we are nothing but atoms swirling through empty space, there can be no such thing as morality" is as valid as saying that if Shakespeare is nothing but letters, punctuation and spaces, his works can have no more meaning than a keyboard."

Secular humanists and materialists think humans are "meat bags"

"No we don't." That's the reductionist fallacy – a fallacy of composition. Sure, a man may be a skinful of meat, perhaps to a cannibal. He is also a pool of chemicals, as well as a collection of subatomic particles. He is also a piece of a population. He exists at all of these scales, and exhibits different properties in each.

Secular Humanism says that most importantly, he is also a man with intrinsic value. Christianity says that his flesh is corrupt, and his soul is sin infected.

<http://www.topix.com/forum/religion/atheism/TEDTV026B5QGP1RQ8/post32146>

Confirmation bias (similar to observational selection): This refers to a form of selective thinking that focuses on evidence that supports what believers already believe while ignoring evidence that refutes their beliefs. If someone believes in the power of fortune telling, the believer will notice the few hits while ignoring the misses. Also called antiprocessing. See "Morton's Demon"

Equivocation fallacy – a fallacy based on using two different meanings of a word in the same argument, as when equating faith in science with faith in a religion, or faith that one will get to heaven with faith that one's car will start again in the morning. "Banks are a good place to put your money, Rivers have banks, therefore, rivers are a good place to put your money"

Earlier, I defined religious faith as unsupported or insufficiently supported certitude, possibly even in the face of contradictory evidence. Logically speaking, it is equivalent to treating a hypothesis as an axiom or theorem, which is then used as a premise for subsequent thought. Obviously, everything that follows is unsound.

Justified belief, by contrast, which is times also called faith, as in having faith that the car will start again tomorrow like it has the last 200 times it was tried, is confidence, belief or trust based on experience, that is evidence. Its degree is commensurate with the quality and quantity of evidence in support of the belief, being more certain as supporting data mounts, but always tentative and amenable to modification pending the arrival of contradictory evidence.

By calling these both faith, the religious apologist is armed to commit an equivocation fallacy, which is the basis of much of the argument for teaching creationism in school. The argument is that secularists have faith in Darwin's theory, which makes evolutionary science a religion, and its inclusion on the science curriculum in public schools while excluding creationism is discriminatory in an unjustified way.

Excluded middle (or false dichotomy): considering only the extremes. "If you don't believe me, you're calling me a liar."

False dilemma (false dichotomy, fallacy of bifurcation, black-or-white fallacy) – two alternative statements are held to be the only possible options, when in reality there are more. Pascal's Wager: "Let us weigh the gain and the loss in wagering that God is. If you gain, you gain all; if you lose, you lose nothing."

Fallacy of quoting out of context (contextomy) – refers to the selective excerpting of words from their original context in a way that distorts the source's intended meaning

Fallacy of scale: "in the big picture, when it's all over, nothing that we do matters."

Half truths (suppressed evidence) – A statement usually intended to deceive that omits some of the facts necessary for an accurate description. "You believe that life arose and developed by random chance." This description of abiogenesis (chemical evolution) and biological evolution omits the effects of competition and natural selection, which are directed, not random. Also called Quote mining and cherry picking, as when one theist points to a scripture that resonates with him psychologically, another to a contradictory scripture, and each dismissed the citations

of the other according to some ad hoc rule.

Hasty generalization (or Over generalization) – jumping to an unjustified conclusion. “The universe is here, so there must be a god.” Buck Crick wrote: “Take Piltdown Man, the famous Sussex fossil. In 1912, amateur archaeologist and premier forager Charles Dawson discovered the link between ape and man – Piltdown Man. Piltdown man was finally proven to be a hoax in 1953. Not a mistake – a hoax. Orangutan jawbone, human skull.” Stilgar: “Dishonest scientists is the reason many people don’t trust them, and laugh their asses off when someone quotes a ‘recent study.’”

Statistics of small numbers – “My parents smoked all their lives and they never got cancer.” Simply because someone can point to a few favorable numbers says nothing about the overall chances. Byron Thomas is 19, black, a freshman at the University of South Carolina Beaufort and a proud Southerner. He hung a Confederate flag in his dorm room window I know it’s kinda weird because I’m black. When I look at this flag, I just don’t see racism. I see pride, respect. Southern pride, that’s what I see.”

[http://inamerica.blogs.cnn.com/2011/12/05/black-student-defends-his-confederate-fla](http://inamerica.blogs.cnn.com/2011/12/05/black-student-defends-his-confederate-flag)

Texas sharpshooter fallacy – is committed when differences in data are ignored, but similarities are stressed. From this reasoning a false conclusion is inferred.[1] This fallacy is the philosophical/rhetorical application of the multiple comparisons problem (in statistics) and apophenia (in cognitive psychology). It is related to the clustering illusion, which refers to the tendency in human cognition to interpret patterns where none actually exist. The name comes from a joke about a Texan who fires some gunshots at the side of a barn, then paints a target centered on the biggest cluster of hits and claims to be a sharpshooter.

Misunderstanding the nature of statistics: “The majority of people in the United States die in hospitals, therefore, stay out of them.”; “Christianity is growing in America, from 151M in 1990 to 173M in 2008” Of course, the total adult population grew from 175M to 228M, meaning the fraction self-identifying as Christian fell from 86.2% to 76.0%

Moving the goalposts (raising the bar) – argument in which evidence presented in response to a specific claim is dismissed and some other (often greater) evidence is demanded.

Non sequitur -from Latin for “It does not follow.” An inference or conclusion that does not follow from established premises or evidence. (e.g., there occurred an increase of births during the full moon. Conclusion: full moons cause birth rates to rise.) But does a full moon actually cause more births, or did it occur for other reasons, perhaps from expected statistical variations? “You cannot do anything that matters after you die.” “I disagree. I believe much happens after we die, and we can still make a difference.”

Inflation of conflict – The experts of a field of knowledge disagree on a certain point, so the scholars must know nothing, and therefore the legitimacy of their entire field is put to question. Used to discredit science and scientists.

Appeal to ignorance (argumentum ex silentio) – appealing to ignorance as evidence for something; where the conclusion is based on the absence of evidence, rather than the existence of evidence. “We have no evidence that God doesn’t

exist, therefore, he must exist. Ignorance about something says nothing about its existence or non-existence

Argument from authority (argumentum ad verecundiam) – using the words of an “expert” or authority as the basis of an argument instead of using the logic or evidence that supports an argument, as when quoting Einstein about religion.

Unwarranted assumption fallacy – The fallacy of unwarranted assumption is committed when the conclusion of an argument is based on a false premise (implicit or explicit)

Weak analogy – when an analogy is used to prove or disprove an argument, but the analogy is too dissimilar to be effective, that is, it is unlike the argument more than it is like it. “Not believing in the literal resurrection of Jesus because the Bible has errors and contradictions, is like denying that the Titanic sank because eye-witnesses did not agree if the ship broke in half before or after it sank.”

Thought-terminating cliché – a commonly used phrase, sometimes passing as folk wisdom, used to quell cognitive dissonance, conceal lack of thought-entertainment, move on to other topics etc. but in any case, end the debate with a cliché not a point.

Argumentum ad baculum: – An argument based on an appeal to fear or a threat. (e.g., If you don't believe in God, you'll burn in hell)

Argumentum ad ignorantiam – A misleading argument used in reliance on people's ignorance. “In spite of all the talk, not a single flying saucer report has been authenticated. We may assume, therefore, there are not such things as flying saucers.”

Argument from (personal) incredulity – I cannot imagine how this could be true, therefore it must be false

Hedging – using words with ambiguous meanings, then changing the meaning of them later.

Moralistic fallacy – inferring factual conclusions from purely evaluative premises in violation of fact–value distinction. For instance, inferring is from ought is an instance of moralistic fallacy. Moralistic fallacy is the inverse of naturalistic fallacy defined below.

## 0.16 Eastern History and faith versus reason

We discussed the history of the Western intellectual tradition from Thales and Aristotle to Galileo. What was left out was the Middle Ages in between, which began with the fall of Rome and the Dark Ages, the first part of the Middle Ages, also known as the Age of Faith. Galileo at all come at the beginnings of modernity, which begins with the Renaissance and morphs into the Enlightenment, or the Age of Reason, immediately following the Middle Ages. With this came the advent of science and the modern democratic political state with its church-state separation, limited government, and guaranteed personal political freedoms.

The Far East had a similar history in the sense that its greatest philosophers were stymied by had a head start coupling empiricism to rational skepticism, but never got off the ground developing science. The reason was

In collection of essays attributed to Mo Tze (470-391 BC) and his disciples, who lived a century-and-a-half after Thales, a test was proposed for every doctrine: "Question its basis. Ask if it can be verified by the sights and senses of common people. Ask how it is to be applied and if it will benefit the greatest number."

Science and free inquiry require the light of free expression to flourish, and rely on the unfettered questioning of authority and the open exchange of ideas. This was lost. A few hundred years after Mo Tze's death, Qin Shi Huang, the first emperor and unifier of China, took power. Those that invoked history to criticize the present had their family executed. The works of MoTze and Confucius and other philosophers were destroyed by fire. Scholars that resisted and tried to preserve the forbidden books were buried alive.

Neil DeGrasse Tyson produced a fascinating video on this subject, and looked at a few different times and places in history where free inquiry flourished, and then was extinguished. He cited what he called naming rights as evidence that this had happened. When he was discussing the ancient Greeks, he noted that they had gotten to name the constellation. In our time and place, he commented on the names of the heaviest elements, including Americium, Berkelium, Californium, Einsteinium, Fermium, Lawrencium and Seaborgium – each honoring an American scientist or location. From his video comes this passage discussing the Arab enlightenment in our Middle Ages, and its eventual demise when the spirit of free inquiry succumbed to faith based authoritarianism:

"There was this particularly fertile period [between 800 and 1100 AD] when the intellectual center of the world was Baghdad. It was completely open to all visitors, all travelers – Jews, Christians, doubters which today we might call atheists – they were all there exchanging ideas. It was in that period that we had the advances in engineering, biology, medicine, and mathematics. Our numerals are called Arabic numerals. Do you ever stop and think about that? They create an entire field called algebra, itself an Arabic word. Algorithm is an Arabic word. All of this is traceable to this 300 year period, So they had naming rights."

"Of all the stars that have names, two-thirds of them have Arabic names. While the constellations are Greek and Roman, the stars' names are Arabic. How does this happen? How do you get stars named with Arabic names? It happens because there was this particularly fertile period – this 300 year period [about 800-1100 AD]- when the intellectual center of the world was Baghdad. It was completely open to all visitors – all travelers. They were all there exchanging ideas, and it was that period where we had advances in engineering, biology, medicine, and mathematics. Our numerals are called Arabic numerals! They created a whole field called algebra an Arabic word. All of this is traceable to this 300 year period."

"Ibn al-Hazen (965-1040 AD) was the first person ever to set down the rules of science. He created an error-correcting mechanism, a systematic and relentless way to sift out misconceptions in our thinking. Finding truth is difficult and the road to it is rough. As seekers after truth, you will be wise to withhold judgment and not simply put your trust in the writings of the ancients. You must question and critically examine those writings from every side. You must submit only to argument and experiment and not to the sayings of any person. For every human being is vulnerable to all kinds of imperfection. As seekers after truth, we must also suspect

and question our own ideas as we perform our investigations, to avoid falling into prejudice or careless thinking. Take this course, and truth will be revealed to you.”

“And then, something happened. ‘The 12th century brought the influence of the scholar al-Ghazali Al Ghazali (1058-1111 AD), and out of his work you get the philosophy that mathematics is the work of the Devil. Nothing good can come of that philosophy. With that, combined with other sort-of philosophical codifications of what Islam was and would become, the entire intellectual foundation of that enterprise collapsed and it has not recovered since.’ ”

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