M10P1 What is Proof

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Black holes swallow anything that enters. How do astronomers prove black holes? Atoms and electrons can’t be seen but can be isolated and studied. Quarks can’t be isolated and “never exist in a free or independent state..” -lecture

Proofs in logic, mathematics, physical science, and historical science or in legal investigation are arrived at per the canons and tools of their specialities. A mathematician may well not understand proof conditions for physical sciences, *et a*l.



Proof is difficult. Proof requirements are not well understood outside the speciality. In today’s pandemic of Covid, resisters to vaccines and masking insist they’ve done the research to reach their own conclusions. And yet they are ill equipped to understand the science. For the most part they seek evidence that might confirm their fears and prejudices on the matter. They use every day logic, not the canons of epidemiology or medicine.

Disproving is perhaps even more difficult. Often in disputes, people use the canon and tools of different disciplines to prove something in another discipline.

The lecturer presents seven types of proofs.

Types of Proofs

a. Axiomatic Truth

b. Logical Proof

c. Mathematical Proof

d. Empirical Proof

e. Historical-Legal Proof

f. Model-Based Proof

g. Relational Proof

**Axiomatic proofs** are basic, self-evident truths and proofs. Ex: a = b = c.

 12 inches = 1 foot = (1 yard / 3)

This is an example of a universal axiom. There’s also the subcategory of particular axioms. I tried to understand this subcategory and read

Experimental sciences - as opposed to mathematics and logic - also have general founding assertions from which a deductive reasoning can be built so as to express propositions that predict properties. <https://en.m.wikipedia.org/wiki/Axiom>

Mendel’s laws of genetics. These are based, I believe on observations that seem to be consistent. Not everything has been tested so this kind of axiom may not be universally proven, but based on consistent studies it is asserted as truth. Since my mother had brown hair, born to parents both with blond hair, her biological father must be different from her siblings who all four had blond hair. The father she knew treated her the same as his other children, so she never suspected.

**Logical proofs** are a fundamental science enabling a rapid advance in objective science. Logic reduces it’s statements to the most fundamental level. With two of such associated statements are studied side by side they lead to inevitable conclusions. The canon, rules and standards must be stringently applied. Assumptions have been made, tests performed, faulty logic eliminated.

I’m not sure I see the difference between logical proofs and particular axioms. I’m inclined to think that particular axioms might be logical proofs that have stood the test of time.

**Mathematical Proof**

Both Axiomatic as well as Logical Proofs need to be invoked to arrive at Mathematical Proofs They are universal within their systems. Some mathematical systems: prime numbers, whole numbers, integers, rational numbers, irrational numbers, real numbers.

Newer branches of mathematics have been developed in the last three to four centuries and these now find many applications in cutting-edge areas of research and technology. Proof in these fields often takes methodologies totally different from what is applicable in simple arithmetics or Euclidean (normal) geometry.

Mathematical proofs apply consistently within their numerical system. Mathematical proofs don’t apply outside of mathematics. Muslims use mathematics to counter the Trinity of God known by Christians. 1+1+1 NOT = 1, Muslims say. They apply mathematical proofs outside of mathematics.

Mathematical truths can’t be fairly applied outside of mathematics. Christians shouldn’t try to rebut an illogical reasoning with a like type of reasoning. Two wrongs don’t make a right.

God is a person, not a mathematical system, although he is the author (or discoverer, however you may see it) of mathematics. We can learn about him though the consistency of mathematics. But we can’t boil him down to even a superior mathematical system.

I like James Weldon Johnson’s poem Creation.

And God stepped out on space,

And he looked around and said:

I'm lonely—

I'll make me a world.…

He looked on his world

With all its living things,

And God said: I'm lonely still.…

With his head in his hands,

God thought and thought,

Till he thought: I'll make me a man!

Up from the bed of the river

God scooped the clay;

And by the bank of the river

He kneeled him down;

And there the great God Almighty

Who lit the sun and fixed it in the sky,

Who flung the stars to the most far corner of the night,

Who rounded the earth in the middle of his hand;

This great God,

Like a mammy bending over her baby,

Kneeled down in the dust

Toiling over a lump of clay

Till he shaped it in is his own image;

Then into it he blew the breath of life,

And man became a living soul.

This God made a helpmate for this man (Genesis 2:18) and God visited this human couple frequently if not daily. Interesting what he formed together with this man and woman. Just an observation, not a proof. No actual theology in this observation. But is is apparent that God is social. If he made all things and has always existed it would seem to have been lonely by himself. Or as a Trinity he may not have been by himself. God is a mystery we can only faintly imagine.

**Empirical Proof**

Empirical proofs require hypotheses and typically require testing for consistency. Large samples allow for infrequent exceptions or mistakes in following protocol. Statistics records results. The testing must be repeatable with similar results. Inconsistency invalidates the process. Margin of error must be recorded. Cross checking by others is needed to confirm results. All of this is carefully analyzed. Mathematical models are created and studied. I’m not fully understanding what I read here. But “if the theoretically predicted results match with the computed values, the theory that predicted all this is accepted as *close* to reality.”

***Close to reality.*** Proved within accepted margin of error. It is this margin of error that I think much of the population rejects today for Covid vaccination effectiveness.

The public wants a zero margin of error. They rebel against such empirical proof when they perceive elite scientists who understand such evidence as pushing the science down their throats. So the public insists on doing their individual research with their limited logic and understanding of proofs.

On the other hand, until the Covid rebellion at least, empirical proof has often been seen as the most common type of evidence. People can think that everything can be tested empirically. They may demand empirical proof of God’s existence. However, empirical proving can only be done when we have matter and energy. Things such as history and human behavior are outside of matter and energy and require their own methods of analysis and proof.

Note: The web page I read seemed to describe Mendel’s laws of genetics as an example of a universal axiom. However, it seems to instead possibly be an example resulting from empirical proofing.

**Historical-Legal Evidence**

Historical-Legal proof deals with events that aren’t reproducible. These are every day events, sociological and psychological sciences, historical science, and some branches of the biological sciences. I was unfamiliar with the expression *historical* *science*. I find this definition: “using knowledge that is already currently known to tell the story of what happened in the past.” <https://www.yourdictionary.com/historical-science> The primary sub-fields listed were Paleontology, Archaeology, Forensics, and Geology. Wikipedia adds “History, the study of the past as it is described in written documents.” Television shows such as CSI and Cold Case Files demonstrate forensics technology. When the majority of forensic deductions reach a high probability through a process of reviews and reconsiderations we have a proof somewhat similar to the repetition and analysis in the Empirical Proof. Historical/legal evidence uses skills common to axiomatic, logical, mathematical, and empirical proofing.

Archaeological, historical studies benefit from science and technology. Charred scrolls such as the En-Gedi scroll, found in the Holy Ark of a Jewish community dating to around 700 B.C., had burned along with the rest of the settlement in the year 600 can be deciphered using digital scanning and virtual unwrapping" software. This makes the oldest Pentateuchal scroll ever found in Hebrew outside of the Dead Sea Scrolls readable without damaging the remnants discovered. <https://www.washingtonpost.com/news/speaking-of-science/wp/2016/09/21/how-scientists-read-an-ancient-and-fragile-biblical-scroll-without-unrolling-it/>

**Legal-Logical Evidence**

Legal-logical evidence closely parallels historical-legal evidence. One collects all the physical and non-physical evidence to analyze and reconstruct a single event. Multiple theories may be proposed and then a deep study tries to eliminate all but the last remaining. In court this is then called circumstantial evidence. On occasion a different truth is later found and, in case of persons serving prison sentences the conviction must be thrown out. Legal-Logical evidence, although a powerful tools for reconstruction and evidence, is not foolproof. A careless or prejudiced researcher can draw a wrong conclusion. Thus in the field of Christian apologetics only proofs considered “undisputed” should be presented. Disputed and circumstantial evidence must not be used to defend the Bible. And we should not permit such evidence to be used against the Bible.

**The Relational Proof**

Relational proof is informal evidence in everyday life. It’s based on expectations developed from everyday life. It comes from trust in friends and authorities. It is normal to believe our parents as a child, our teachers as a student, the books we read. We get burned by hot water and learn. We fall in love and learn that sometimes it’s good and sometimes it hurts. It is said that “experience is the best teacher”.

The lecturer points out that we know when we read fiction that the details didn’t actually happen.

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I might point out that when I read history lie fiction I sense a greater truth in historical fiction than I do in traditional histories. That’s because much of history is war. Traditional histories focus on events and dates and outcomes. Historical fiction involves itself in the awfulness, the senseless violence, the hurt, the pain and loss through death. Historical fiction features the loss experienced by survivors. It does not focus on the glories and excitement of victory. It does not focus on the generals from behind the action.

Perhaps my reaction to traditional histories vs. historical fiction demonstrates relational proof in that we only know the realities of war in the experiences and loss of the participants, most of whom are not generals. War affects the majority of participants much the same. Victors and losers in war all hurt and lose much personally. It’s such a colossal waste of life and limb. And yet sinful human beings repeat this folly endlessly.

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Probability based evidence works well in life. Relational proof is familiar to us and works well in Christian apologetics. It helps in discovery of many important truths including the existence of God.

End of proof listings.

We have misconceptions about evidence. It often comes down to who wins or loses an argument. One side’s presentation may be superior. Often an argument is successfully refuted. And we have a winner. But was the argument truly meaningful and honest? Did the winner in the debate even present arguments or did he simply stand on the leg of refuting his opponents arguments. I often see politicians point out flaws in their opponent's proposal but not even have a proposal of their own. So I wonder, “How is nothing better than something, no matter it’s inadequacies?”

Sometimes the debater lays out a scenario and asks, “isn’t this possible?” It may very well be possible. But the possibility doesn’t prove the fact. Couldn’t God have created the world using evolution? Maybe… But would a God seeking friendship with mankind use survival of the fittest to accomplish his purpose? In Matthew 25:40 Jesus, in discussing judgment, commends those he affirms, “Inasmuch as ye have done it unto one of the least of these my brethren, ye have done it unto me.” God also says,”For I am the Lord, I change not.” (Malachi 3:6) For God to have utilized ‘survival of the fittest’ to create people and then prefer those who care for the least fit would require that God do a turnabout and reject his previous actions.

The debater might say “Picture this scenario.” And yes, the Benzene-ring in the Organic Chemistry was solved after a researcher followed up testing according to a dream he experienced. However, the Greek philosophers devised the thought of the sun revolving around the earth based on a mental picture. Of course it turns out to be the earth revolves around the sun. Mental pictures help us think but they are only starting points, not evidence of any kind. We can do mental pictures of heaven but they can’t be presented as truths of heaven.

Debaters my appeal to authorities. But opinions from authorities remain educated guesses. Opinions are not proof. Generally you can find authorities with opposing opinions. Or we might look at popularity of opinion. A child arguing her point may tell mom, “All my friends wear lipstick and makeup!” Mom is not often convinced. Opinions and popularity are at best weak arguments. Yet our opponents can find them effective because few of us wish to always be in the minority. We seek the popular group.

Silence is not a proof. Bible critics shouted loud that Bible history wrongly claimed the existence of the Hittite nation, camels as beasts of burden prior to known domestication. Then in the 1900s archaeology discovered the Hittite empire, libraries, and even the legal code. They discovered man’s use of camels further back than then known. Archaeologists also discovered writing by Egyptians prior to the time of Moses. Moses was raised as a teenager according to the Bible as an adopted son of the reigning Pharaoh. Of course he learned writing.

Lack of proof is not a proof.

Analogy is not proof. It may help explain but it does not prove. In the hands of a skillful debater, an argument from analogy can become a weapon to prove anything in the world. Gay sex may be analogous in terms of pleasure to straight sex. But as the saying goes, God did not create a helpmate named Steve. He created heterosexual unions in marriage. This example couldn’t be used in a secular discussion unless the dispute were directly the question of God’s word on homosexuality.

Circular reasoning starts with something we agree on. This agreement is then used to attempt to convince us of something else. I best understood this from <https://www.softschools.com/examples/grammar/circular_reasoning_examples/401/> .

Examples listed were

The Bible is true, so you should not doubt the Word of God.

 This argument rests on your prior acceptance of the Bible as truth.

Women should be able to choose to terminate a pregnancy, so abortion should be legal.

 This argument says abortion should be legal because women have the right to an abortion.

I deserve to have a later curfew, so you should let me stay out until 10pm!

 This argument says the person should stay out until 10pm because he/she deserves a later curfew.

Circular reasoning at first might sound reasonable but is contrived and not proof. The Pharisees arrested Jesus, wanted official sanction for punishment, brought Jesus to Pilate and said they had arrested Jesus and that Pilate should punish him. But arrest doesn’t prove guilt. Still remaining is process and the weighing of evidence, followed by pronouncement of guilt (or guilt not proved) and finally punishment if pronounced guilty. Pilate tried to follow this process, for awhile at least.

Another example by the lecturer is about geological layers proving evolution. For this theory to be true the lowest layers of rock should show only simple organisms. Higher layers should progressively show examples of more complex life. The lecturer studied an introductory textbook on geology and found instead that the biologist created a chart detailing this increasingly complex layering based on a theory. The geologist never found a location matching this chart. Instead the geologist found many places containing smaller, incomplete layers, pieced these together according to the order in the complete theoretical chart. SEEMS to prove the theory but is instead a cut and paste from nonconforming, small samples. There’s no confirmation that the complex life at the top level began from the original simple organisms from the bottom layer. The intervening layers from the geologist came in small sections from different places throughout the world.

The conclusion seemed to result from empirical research but didn’t. Theories don’t present truth. A theory is only one of many possibilities. Only one theory on an issue can be right and perhaps no theory proposed may in fact be right. Theories should not be permitted against the Bible. And theories must not be used to prove the Bible.

Anecdotes prove nothing. Stories help explain. But personal stories don’t provide proof. Our pet ideas don’t prove substance. I like to imagine that when God recreates the new earth he will recreate dogs and one of them will be a brown and tan cocker spaniel that runs straight to me. I expect recreation will include dogs but very likely not the breeds we’re familiar with.

Slogans aren’t reasoned evidence. But critics know slogans are powerful in the hands of advertisers, politicians, propagandists, and mind-manipulators. Christian apologists should learn to recognize slogans, analyze them, and point out the attempt to manipulate the listeners with fake evidence. [Is the saying “God made Eve, not Steve” a legitimate, fair truth? Or is it a slogan to be avoided?]

The Christian apologist must understand and know the answer to the question, “what is science?” We’re surrounded by science and technology. Science is often the wedge critics strike against the Bible. Often these complaints are thrust by a poor understanding of science. Claims are made from disputed science. Disputed science is not science. We already clarified that theories are not science. We can ask, “Is what you’re saying established fact? Or is it at least partially based on unestablished theory?”

Today physical and social scientists use models. The average listener understands what a theory is but has trouble recognizing a model as a companion to theory. Models are constructed on super computers based on qualitative and mathematical data. Qualitative models come from verbal, descriptive data. Descriptive models can be easily constructed but are more difficult to analyze. Mathematics can be understood objectively. Perception and bias can infiltrate descriptive models. Qualitative models serve best as a first stage of study giving way to definitive objective, quantitative models.

Most of us have no idea of the power of mathematics in the hands of a highly educated mathematician. I remember being stunned with the concept of imaginary numbers. This was in a first year college algebra class. I can only imagine feeling totally incompetent in math looking at the formulas a college senior majoring in math finds dead easy. They haven’t even begun graduate school. Yet, even much of nature still defies the most skilled mathematician. Mathematical models can fail.

All models are approximations. A model starts simple. After feedback it is revised to account for additional complexity. This is an oft repeated process, becoming more accurate and also more complex. It may take decades. The current model of the atom is a hundred years in process.

Then quarks were discovered in the atom to add complexity to the model. Now I find that preons are hypothetical particles proposed as the building blocks of quarks, a theory to continue revising the model of the atom. We may still be revising the model of the atom over a second century. <https://www.newscientist.com/article/mg19726431-700-could-preon-stars-reveal-a-hidden-reality/>

A weather forecast is aided from incredibly complex models of climate. Yet the forecast sometimes gets it wrong. Still, the forecast beats the weather announcer’s guesswork. These fairly accurate forecasts help farmers plan and power companies be prepared to clear fallen trees and restore service. They even help me plan a day outing with lessened concern about being rained out.

Mathematical modeling helps save lives with diagnostic machines. I know that my suspected stroke six years ago wasn’t really a stroke because two MRI procedures at different hospitals showed no brain damage then or before. I had a TGA instead of a TGI/mini stroke. A TGA often occurs after a family member or friend suddenly dies. My sister had died of spinal cancer two weeks after learning she had it and only two days before the onset of my TGA.

Credit card companies use a fuzzy logic model, complex mathematics, to detect credit card fraud. This catches the majority of people who think they’re smart enough to beat the bank and fraudulently get rich.

Mathematical models such as weather forecasting, medical diagnosis, and credit card security use highly refined models. Yet sometimes it rains on a day forecast to be sunny. Sometimes diagnostic models fail to diagnose. Nearly three years ago I entered the hospital with sepsis, an often fatal condition. I left the hospital pumped full of antibiotics but with no diagnosis.

Models are only approximations. The best get it *close* to right. None get it right 100 percent of the time. We may perhaps lean on them. But models never provide us complete truth.

Models can’t refute God and models should not be used to confirm God. We each choose what level of evidence satisfies us at the moment. We can compare models.

Sometimes models provide differing results. This I suppose explains the reason for occasionally different forecasts by different meteorologists. Not all use the same model. We can compare models and choose which seems more accurate.

Conservative Christians have compared the creation and evolution models. Most of us compare casually while a few seriously study the models. Conservative Christians find the creation model compelling. Some less conservative Christians develop a blend between these two models. In my opinion they try to straddle the fence with a divided faith. Choosing between models requires an element of faith.

We as people depend on sorts of proof. We know flipping the light switch from off to on gives us light. We’ve tested that hypothesis so often we don’t question it. We buy a ticket to fly between Detroit and Phoenix and don’t make alternate plan for the unexpected cancellation of the flight. But occasionally the light doesn’t appear. And occasionally the flight crew goes on strike. Nevertheless, we live based on evidence. And such evidence doesn’t often fail us. But when it does it’s usually the inability of humans to invent such things as “never die” lightbulbs.

We blithely go about our business not even questioning our expectations. We are sure! We’ve seen countless evidence and we don’t even think about it. [It’s amazing that God in his creation of the world designed such powerful, repeatable principles of physics. And God doesn’t require faith in him or worship to him for us to repeatedly benefit from his generous design.]

Universals can’t always be proved. The lecturer points to ravens. They’re all black you say? You’d actually seen all ravens? Well, those I’ve seen were all black. Realize though that if only one non-black raven should be found, it would negate the universal that *all* ravens are black.

In looking up the black raven example I found the black raven paradox entries on google. Apparently this is a common example. I also read that black ravens have highly glossed plumage showing iridescent greens, blues, and purples. <http://naturemappingfoundation.org/natmap/facts/crow_vs_raven.html> However I must point out that the lecturer, though not necessarily the web sites, said ‘dark’ ravens.

I did find a young white raven, discovered in Canada I think, at <https://globalnews.ca/news/7923210/extremely-rare-white-raven-north-island-wildlife-recovery-centre/> and it’s not albino. However it’s feathers are weak and it’s likely to die. I also found the web site <https://awoiaf.westeros.org/index.php/White_raven> about a white raven of a separate species. I think this is a fictional raven from the *Ice and Fire* story or movie. Casual research can misinform a person.

“While universality cannot be proved in daily life or life-related sciences like history, they can be handled in mathematics and physical science”. -Lecturer Most of mathematics depends on universals. The sum of two sides of a triangle will always exceed the length of the third side.

People forget or ignore the case that true universals are not that common outside of mathematics. You can’t use so called universals to prove or disprove the Bible. And you can’t use mathematic universals to prove social, historical, or biblical claims. No, the doctrine of the Trinity can’t be confirmed or refuted by the universals of mathematics.

Even in the biological and physical sciences, which have their universal truths, even they differ from the universals of mathematics. [I failed to understand the concluding statement in regard to these reminders - “These presuppositions are in turn the result of a Bible-based theistic view of the universe.” I think something might be missing between these two thoughts.]

Existence of a person, item, or place can be proved. Non-existence cannot be proved. The unknown may be discovered tomorrow or a hundred years from now. Or perhaps it may never be discovered. But we can’t know it will never be discovered.

Even researchers sometimes assume that if archeology hasn’t found it, then it never existed. Ordinary non-research persons can be similarly convinced. We shouldn’t make it that easy. The claim of non-existence when simply not yet found is a false deduction.

Even in the empirical sciences lack of discovered evidence is sometimes claimed as proof it doesn’t exist. In the early days of HIV it was thought that the virus was present *Only* in blood. Later it was found in most bodily fluids. They should have said “so far HIV has not been found in other bodily fluids, but…”

“Historical information needs canons of historical proof, and empirical information needs experimental demonstration… Physics cannot be used to disprove ethical values, and history cannot be used to disprove Chemistry.” -Lecturer

Circumstantial evidence cannot prove anything. It may demonstrate probability but it fails the proof test. I’ve always believed that the death penalty practiced in the American judicial system should NEVER be given when circumstantial evidence is used to convict. Of course that would probably eliminate the death penalty because sometimes even confessions are coerced. Apologists should remember that circumstantial evidence must never be allowed unchallenged against the Bible. And we must refrain from using it in favor of the Bible.

Most people believe most anything can be proved or disproved. That’s not really true.

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1. How this module helped your studies

I did this week point out that “Everyone…” is a false argument. And later that policies at one place are not proof of correctness. Both times on twitter.

In the course of these studies I’ve learned more about apologetics other than the definition. In the U.S. though it’s possible to go long periods without meeting an avid non-believer. Most people in the U.S., it seems to me, has some level of Christian belief or are apathetic agnostics.

2. What new lessons you learned

Logic is not just the relational, everyday thinking we experience each day. In empirical logic we don’t normally read more than the conclusions and may well misunderstand the role of the margin of error. And any empirical study may have it’s critics. Empirical logic, if I may, merges into the logic of models. Models are commonly spoken of as pretty much a truth. It takes a lot of study to understand the underpinnings of the model. We must realize that while models may present much logic that they are still changeable as more learning takes place.

3. Your critical evaluation on the topic. WE mean what is the shortcoming you see in the text, your suggestions for improvement.

I can’t distinguish particular axioms from empirical proof. I thought I found Mendel’s laws as an example of a particular axiom on the web. I’d looked it up because I didn’t understand the lecturer’s words. Then on reading about empirical proofs, which I already had at least a limited understanding of, I felt Mendel’s Laws fit better with empirical proof. So neither the lecture nor the web explained particular axioms for me.

I question how to operate in regard to appeals to authority. I for instance don’t expect to authoritatively speak to the questions of science. I can perhaps quote authorities. But I’ll never be an authority. If debating evolution I’m sure that at least sometimes there will be science majors in the group. I can’t even point out flaws without quoting someone else. I agree that authorities come from both sides of an issue, but my limited research correlates with that of liberal arts graduates thinking they can do their own meaningful research on Covid and vaccines.

4. How does this lesson help you?

I appreciate the reminder that two wrongs don’t make a right. We should not use reasoning in favor of the Bible and biblical truths that we would condemn coming from a person opposed to the Bible. Yet it is easy to use anecdotes and familiar slogans when defending the faith. It’s easy to mix logic types.

This lesson certainly teaches us that logic is complex. We can expect to sometimes be overwhelmed in a debate/discussion if we don’t recognize the curveball thrown at us by the critic. We can’t rebut it if we don’t recognize it.

I look forward to learning the skills of apologetics to be presented in the next ten lessons.

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