Science and Christianity

Introduction to the course

The course contents

I. The Nature of Truth
II. The Nature of Christianity
III. The Nature of Science
IV. Sorting Truth from “Truth” from Fiction

What we will try to learn

1. The nature of truth
2. How the different sources of truth work
3. How to separate truth from truth
4. How to separate truth from fiction
5. The role of faith

How to prepare for each session

1. Read the assigned materials.
2. Answer the questions for each topic.
3. Consider the issues that are being raised by the readings.

I. The Nature of Truth

Reading: *Clearing a Path for the Gospel*, pages 9-25; Appendix I & II

A. What is necessary to have something that can be called "truth"?

B. What are the elements needed to establish truth?

C. What are the four ways of seeking truth?

D. What is self-evident truth?

Why are the truth-determining mechanisms of philosophy weak?

E. On what is deductive reasoning based?

F. Why is mathematics inductive reasoning and not philosophy?

G. What is syllogistic logic?

II. The Nature of Christianity

Reading: “Creation_vs_Science”; “The Presence of the Lord”; Appendix III

A. On what is theology based?

What is the proper means of understanding Scripture?

B. What is the nature of God’s omnipresence?

C. What does God being invariant mean?

D. How can God know what will happen in the future?

E. To what can God’s omnipotence be compared?

Why can’t God make a stone so heavy that He can’t lift it?

F. In what two ways, from a human perspective, does God work?

III. The Nature of Science

Reading: *Clearing a Path for the Gospel*, pages 25-28; Appendix IV; "Reaching Scientists with the Gospel"

A. How does science relate to philosophy?

What is astrology?

What is alchemy?

B. How is science similar to theology?

What are the requirements for evidence to be scientifically valid?

What is the falsification process?

C & D. Explain the scientific method.

E. What are the two corollaries of the fundamental assumption of science?

G. List several reasons why scientific theories might be false.

IV. Sorting Truth from "Truth" from Fiction

Reading: Appendix V; "Genesis I and Science"; "Rock cycle" in Wikipedia

A. How do scientists explain the origin of the universe?

B. What is the primary technique used by scientists to determine the age of the earth?

C. What are the steps in the rock cycle?

D. Why is how life originated such a big issue?

E. What is the difficulty for a Christian in trying to formulate a scientific alternative to evolution?

F. What is the inherent limitation of all scientific models?

Appendix I

Philosophical Truth

Pilate was not looking for a reply when he responded to a statement by Jesus with the question "What is truth?" (John 18:38) He was scoffing at the idea that this lowly Galilean might actually have the correct view of the world. Pilate could consult numerous schools of philosophy about the nature of truth, and he had plenty of supplicants who were willing twist any situation to gain his favor. Pilate had heard all the hype and the distortions, and he was cynical. We can deride him for his attitude, but his question still deserves an answer for our sakes, if not for his.

If we think about it, however, formulating a satisfactory definition of truth is not easy. A former United States Supreme Court justice said, "I can't define pornography, but I sure know it when I see it." Many people feel the same way about truth; they think they can recognize it when they encounter it, but its precise definition eludes them. This is shown by the oath administered in many courts. People are asked to swear "to tell the truth, the whole truth and nothing but the truth" in an effort to bracket what might be the actual truth in the matter. Unfortunately, if one does not have a reliable definition of truth, one cannot avoid being deceived by false statements that only have the appearance of truth. This is a grave danger in religious matters.

We can perhaps understand the issue better if we consider a few examples. A major Russian newspaper is called *Pravda*, which means "truth." Most people would not agree that everything printed in *Pravda* is true; in fact, it has often been used as a propaganda organ to greatly distort the truth. In the Declaration of Independence Thomas Jefferson wrote that "We hold these truths to be self-evident that all men are…." Many Americans are willing to believe Jefferson's words, even though his standard of truth was murky at best. Jefferson was not a Christian and believed that truth was formed directly in the human mind. Because the Bible did not meet his standard of truth, he edited it with a scissors, producing what is called the Jefferson Bible.

In searching for the truth, we engage in a process called reasoning. There are two components to reasoning, what we start with and what we get as the product of our reasoning. We call what we start with "assumptions," "premises" or "propositions." We call what we end up with "conclusions" or "consequents." In order to get truth from the reasoning process, the reasoning must be "sound." To be sound the assumptions or premises must be true (i.e., "well-grounded) and the path of argument between premises and conclusion must be free of inconsistencies (i.e., "valid"). But we cannot take it for granted that what is offered up as "truth" these days is either well-grounded or the result of valid reasoning.

For example, politicians, editorialists, humanists, religious gurus and others whom we see and hear in the media are, in effect, philosophers, and their statements are often inaccurate abstractions or overstatements of what is known. These speakers are not so much interested in convincing us with evidence as they are hoping to strike an emotional chord that will cause us to respond in the manner which they desire. This is called "philosophical reasoning" because the speaker is trying to get us to accept his philosophy, and therefore the truthfulness, of his arguments without well-grounded evidence or valid reasoning. Philosophical reasoning is particularly dangerous when applied to religious and moral matters. Let us look at the premises of some well-known philosophers.

Zeno of Citium (founder of Stoicism) claimed that emotions result in errors of judgment. The path to happiness for humans was therefore not to allow oneself to be controlled by desires for pleasure or fears of pain.

Epicurus (founder of Epicureanism) taught that the happy life resulted from living in peace with one's neighbors and avoiding fear and pain through a self-sufficient and self-indulgent life surrounded by friends.

Thomas Aquinas, a proponent of natural theology, tried to prove the existence of God based on reason and the ordinary experiences of nature. He argued that everything that moves has a mover, so the first mover had to be God.

René Descartes said, "I think, therefore I am." He then argued that the existence of God could be demonstrated philosophically, an assertion that most philosophers even at his time rejected.

John Locke claimed human nature was characterized by reason and tolerance. Believing that Christianity represented the highest form of religion, he tried to ground it in reason as presented in *The Reasonableness of Christianity*.

Voltaire (François-Marie Arouet) argued that God existed and created the universe, but that He does not meddle in its operation. This concept of deism became popular among the leaders of the American Revolution but led to Voltaire being condemned by the Roman Catholic Church.

David Hume said, "Reason is and ought only to be the slave of passions." He rejected the idea of abstract moral principles given to man from a divine being.

Immanuel Kant argued that all our knowledge, including that of God, comes from experience, but that we must be active reasoners, using our minds to organize our impressions, to grasp the truth because it would not come to us in a passive manner.

Karl Marx proclaimed that religion was a form of false consciousness through which people deluded themselves into accepting less than what they deserved from society. Religion effectively drugged them.

Friedrich Nietzsche wrote that religion had its roots in weakness and sickness and serves as a means to keep power away from the strong and healthy. He believed that God was no longer the source of morality.

While numerous other philosophers could be cited, it is clear that philosophical ideas of truth always come from within the philosophers themselves, from their hearts which the LORD describes in Jeremiah as "deceitful above all things and desperately sick" (17:9). It is therefore not surprising that the ideas of various philosophers do not agree with each other, for they are built on egocentric foundations. The Christian must reject rather than be taken in by the "cleverly devised tales" (2 Peter 1:16) that such philosophers spin. Sadly, despite its inherent lack of soundness, philosophical reasoning is widely used in searching for the truth by most people today, because it gives them a feeling of power to proclaim their own ideas of truth without having to support it with verifiable evidence.

But if all of the above searchers for truth with their use of philosophical reasoning fail to find truth, how and where should we look for truth with the certainty of finding it? The Bible uses the word "truth" in different ways. Consider three statements of Jesus in John's gospel. In 8:32, the word "truth" is used to designate knowledge – "You will know the truth, and the truth will set you free." In 17:17, it includes the whole revelation of God – "Sanctify them in the truth; your word is truth." In 14:6, Jesus equates himself to truth – "I am the way, and the truth, and the life." We will return to the Biblical concepts of truth in part four of this series.

Appendix II

Mathematical Truth

In the previous article we saw that philosophical truth is unreliable because its source is the corrupt heart of man. At the opposite end of the reliability spectrum is mathematical truth. During our lives we have come to trust mathematics. We learned to count before we started elementary school and soon thereafter were taught arithmetic. We found arithmetic to be reliable because there was only one correct answer for each equation or problem. Later we learned algebra, trigonometry and perhaps calculus. With each of these we could be certain there was a uniquely correct answer because all the terms and operators (e.g., addition, division) were precisely defined by mathematicians. This type of mathematics is called "numeric" and is an example of deductive reasoning. In such reasoning one starts with known information, manipulates it by known rules and obtains a reliable and unique answer.

In high school we also encountered geometry, in which much of the material was quite different from the numeric manipulation to which we were accustomed. We frequently had to prove certain statements to be true where no numbers were involved. Instead we dealt with triangles and other figures for which we needed to show some relationship was true through a series of steps, each justified by some rule that was true for geometric figures. For example, we might have been asked to prove that the base angles of isosceles triangles are equal. Geometry introduced us to a new kind of mathematics, one in which some truism about the object of interest was sought rather than a numeric value. This mathematics is called "non-numeric." Like numeric mathematics, its results are reliable, being the same no matter who does the problem-solving. This occurs because everything used in solving non-numeric problems is precisely defined and not subject to varying interpretations by different people.

Yet, as we are all aware, mathematical answers are not always correct. Even if one pushes all the right buttons on one's calculator, the answer will be wrong if the information one started with is wrong. If one measures a door wrong (e.g., 7 feet 10 inches tall instead of 6 feet 10 inches) or reverses two digits when recording a number (e.g., 136 instead of 163), the mathematical calculation will be valid, but the answer will be wrong. Correct application of mathematics cannot compensate for bad input.

Long ago the Greek philosopher Aristotle concluded the same type of reasoning used in geometry could be used to evaluate other problems as well. He developed "syllogistic logic," another form of deductive reasoning. This gave a way to reliably evaluate the validity of conclusions based on stated premises. Syllogistic reasoning was characterized by a major premise, a minor premise and a conclusion. For centuries students have learned: Major premise: "All men are mortal." Minor premise: "Socrates was a man." Conclusion: "Socrates was mortal." Because the premises in this syllogism are true, the conclusion must be true. All syllogisms have a subject (e.g., Socrates), a predicate (e.g., mortal) and a middle term (e.g., man). Aristotle quickly realized, however, that syllogistic reasoning had its limitations. If the two premises were "Some frogs are green" and "Plants are green," then the conclusion would be "Some frogs are plants." Clearly, this conclusion is not true even though both of the premises are. To determine which of the many arrangements and types of subjects, predicates and middle terms gave valid syllogisms, Aristotle developed five rules which guided this form of logic for 2000 years. Syllogisms were the beginning of "formal logic," which manipulates phrases with the same reliability that arithmetic manipulates numbers.

Within the last century formal logic has been expanded far beyond syllogisms to methods such as truth-functional logic and predicate calculus. In the former, informational statements are coded into a matrix called a "truth table," which allows all possible true and false values for each statement to be combined and evaluated. In the latter, the truth or falseness of any conclusion can be determined from any set of premises by a process which is similar to the proof used for a geometric axiom. By coding premises and conclusions into a symbolic representation, the emotional component so often present in philosophical reasoning is removed. It does not matter how one feels about the merit of an argument; its validity depends only on whether the conclusion can be shown to follow logically (i.e., through rule-based manipulations) from the premises. Formal logic therefore always gives us valid answers just as numerical mathematics always gives us valid answers.

Just as we saw with mathematical conclusions, however, formal logic can give valid conclusions that are not true (i.e. "sound"). For example, "All orange vegetables are poisonous." "Carrots are orange vegetables." Therefore, "Carrots are poisonous." This is a valid conclusion, but the conclusion is not true because the first premise is false. Despite the validity of formal logic, it can be used to lead us astray if we are duped into accepting a false premise or assuming a premise is being used that was never actually stated. For example, if a product is labelled "reduced sodium" or "reduced fat," we tend to assume as a premise that the reduction is significant, not just 1%. Our assumption may be wrong.

A real threat to our faith occurs when people state deceptive premises about religious issues and then they use valid logic to draw us into false beliefs. For example, consider this argument commonly studied in philosophy classes. Premise: "If a god exists, then he is omnipotent." Premise: "Anyone who is omnipotent can do anything." Conclusion: "God therefore can create a stone so heavy that he can't lift it." Contradiction: "But if god cannot lift the stone, he is not almighty. Therefore, the premise that there is a god must be false." While this argument may sound convincing, it is the second premise, not the first, which is false. The correct premise is "If He is omnipotent, then He can do anything *consistent with His will*." God's attributes are perfectly unified and cannot conflict with each other. The existence of God does not depend on our ability to logically prove it.

Now consider a more common argument directed against hell. Premise: "God is love" (1 John 4:8). Premise: "Hell is a horrible place" (Matthew 13:42). Premise: "A loving being would not send someone to a horrible place." Conclusion: "Therefore, God will not send anyone to hell." In this case the third premise is false because it claims that God being love overrides His other attributes, including His justice. It also contradicts His direct statement (Matthew 25:46).

Thus, while formal logic is a major advance over philosophical reasoning in the search for truth, it suffers from two limitations. First, stating the premises and conclusions correctly and developing proofs takes significant study and effort. Many people shy away from it because of bad memories involving word problems and geometry. Second, false premises can lead to false conclusions even if the reasoning is correct. To avoid being deceived, one must be certain one's premises are correct. The fourth part in this series will demonstrate that this requires not only reading the Bible, but studying its doctrines and examining the textual and the cultural context of Biblical quotations before accepting any theological premises (Matthew 4:5-7).

Appendix III

Religious Truth

While mathematical truth from deductive reasoning and scientific truth from inductive reasoning have value in this world, the most important truth for mankind is religious truth. Moreover, if people are not to grope around blindly in philosophical reasoning hoping to find some sort of firm foundation, then there must be some source of religious truth and some standard by which to judge religious ideas. In other words, religious truth must be revealed to us because we cannot rise up to God (Romans 10:5-11). Throughout history people have relied either upon some guru who claims insight of the divine (e.g., the pope or oracle at Delphi) or upon some book of revelation (e.g., the Bible or the Qur'an) which claims to be God's word. Of all the religious sources, only the Bible presents a God who freely delivers people from their sins and promises eternal salvation. All the rest make salvation dependent on some course of action in which the person must earn or contribute to his salvation through his own efforts.

With such a great offer, one would think that Biblical Christianity would attract nearly everyone, but just the opposite is the case. The reason is that people inherently want to take some of their own good deeds to the judgment throne of God when they are summoned to appear before Him. They do not want free salvation because it means they must repudiate not only all their sins but also everything they view as their own meritorious works (*Luther's Works* 79:196). They are unwilling to accept the Biblical declaration that they are totally depraved and have no works acceptable before the LORD (John 15:5). They seek a "rationalized truth" that is less clear-cut, one that leaves room for negotiation over issues of behavior and piety. Biblical truth becomes distorted when people try to mix "rationalized truth" into it. Consider the following examples:

Written Hebrew commonly contains no vowels. These are mentally added by the reader. To standardize the reading of the Biblical text, the Masoretes (6th century AD) added vowel points to the Old Testament. Exodus 23:19 contains the word חלב, which can mean either fat or milk. In the context of the Biblical dietary laws, it should have been pointed to read "fat," because the Israelites were forbidden from killing both a mother and her young; therefore, cooking a kid in his mother's fat would have been forbidden. To raise the bar of Jewish piety, the Masoretes pointed חלב as "milk." This forced the Jews to introduce elaborate man-made rules, previously unknown, so that meat and dairy dishes would be kept separate in Jewish cooking to prevent accidentally violating this command.

In the 4th century St. Jerome translated the Bible into Latin. He rendered the Greek word κεχαριτωμένη (held in favor) in Luke 1:28 as *gratia plena* (full of grace). This mistranslation seems to indicate that Mary was already perfect since she was "full of grace" and needed no more grace. That she referred to herself as being called "blessed" in Luke 1:48 only reinforced in some minds that she must have been without sin. From this false premise the whole cult of Mariology in the Roman Catholic Church was developed.

John Calvin was a brilliant Christian scholar, yet he adopted the non-Biblical idea that God would not expect us to believe what was against reason. He therefore used reason to filter Biblical teachings. He argued that Jesus' human nature could only be present at one place like everyone else's human nature. Consequently, he taught that Jesus is currently at one place in heaven and therefore cannot be really present in the bread and wine of Holy Communion. Moreover, because it would have been irrational for God to waste His efforts to atone for the sins of those who would be damned, Jesus only suffered for the sins of the elect. In Calvin's opinion, justification is not universal (2 Corinthians 5:14-15).

Matthias Loy, a conservative Lutheran theologian in the 19th century, stumbled into error when he tried to reconcile God's desire to save all people with His election of only some to faith. Loy misused the hermeneutical principle called the "analogy of faith" to reshape these teachings so that they would fit together rationally and could be true at the same time. He taught that people were predestined "in view of their faith" rather than "into faith," thereby moving the burden of their salvation back onto the people. Sloppy principles of interpretation can undermine the revealed truth of the Bible.

From the earliest days of the Reformation, Martin Luther recognized the inerrancy of the Bible and the importance of understanding it correctly because he knew that there can be no religious truth apart from the LORD's revelation. *Sola Scriptura* (from the Scriptures alone) became one of the pillars of the Reformation. Those who claim Luther did not regard the Bible as inerrant have not read enough of his writings. In more recent times we have used the phrase the "narrow Lutheran middle" to indicate that we may teach no more and no less than is revealed in the Scriptures, as stated in both Deuteronomy 4:2 and Revelation 22:18-19.

One of the most pervasive errors, and one that corrupts the principle of *Sola Scriptura,* is the teaching that religious truth develops as time passes. In this philosophical view, God gradually becomes wiser in His dealings with mankind; therefore, some of the things in the Bible should no longer be accepted as true. They were the products of the LORD Himself being ignorant of the truth or of His shaping it for the benefit of more primitive peoples. This ignores the Biblical teaching that God is not a creature of time and therefore never changes (Ps 102, Malachi 3:6).

For the Christian, the source and standard of all religious truth is the Bible, as the LORD revealed it in the original Hebrew and Greek. If we try to use our reason to judge it, then we no longer have God's truth, but have fallen into back into philosophy. We lose our eternal salvation if we try to shape our relationship with God with ideas from our sinful hearts or our clever minds rather than what is revealed in His Holy Scriptures.

Appendix IV

Scientific Truth

In the previous article we considered truth in terms of mathematics and formal logic. These are examples of deductive reasoning. When using deduction, we learn no new information that is not inherent in our premises. We are working within a well-defined box with well-understood tools. If we begin with premises which are true, then our conclusion will also be true. This is of great value for business and engineering, but it does not meet the needs of scientific investigation.

The driving motivation for scientists is to expand knowledge. Therefore, they need to reach beyond the boundaries of what is stated in the premises of what they are studying. This involves what is called "inductive reasoning," which goes from specific cases to a more general conclusion. For example, "It snowed in February this year, last year and ever year that I remember. Therefore, it will snow next February." "Next February," however, is not within the set of initial information, so we are extrapolating when we state something about it. Such generalized conclusions run the risk of not being true, even though all the premises are true. Perhaps unusual conditions will cause it not to snow next February.

Virtually all science is based on inductive reasoning. This is because scientists can usually study only a small fraction of the cases that occur in nature (e.g., all the stars in the Milky Way). Only in the rare instance when they are able to actually investigate every possible case can they say with certainty that something is true.

To understand the nature of scientific truth, one has to avoid being taken in by meaningless statements about it such as "It's a scientific fact that…." This statement claims that the information being put forth is absolutely true. But how do we know the "fact" is true? Establishing that it is true might take considerable time and effort. Consequently, scientists regard something as a "fact" only if its probable truthfulness is accepted by everyone discussing it. If some people reject it, it is not a "fact." Such a "fact," whether true or not, becomes a part of one's set of unproved assumptions.

"Evidence," which is the heart of scientific investigation, is obtained through making observations of the physical world. Unfortunately, collecting evidence (data) can be affected by physical limitations (e.g., the precision of the instrumentation) or the bias of the observer. For observations to be considered evidence, they must be made and validated based on a set of rules (standards) which have been agreed upon *before* observations are made. For example, archeological findings are sometimes announced that "disprove the Bible," only to have those findings later discarded once the observations are reviewed according to the accepted standards.

The goal of scientists is to create models which explain all their observations in terms of the natural properties of matter, energy, space and time. Because the conclusions of inductive reasoning can never be absolutely certain, scientists have developed a method of determining which models are more likely to be true than others. "Scientific truth" is therefore the result of the scientific method. This method requires that observations be made, a theory (model) be formulated to explain the observations, the model be submitted for review by the scientific community (falsification challenge) and the model be modified, as necessary, based on any criticism. The process is then repeated until sufficient evidence exists for it to be generally accepted (i.e., scientifically true) or rejected. Because science does not have the absolute certainty of deductive reasoning behind it, the falsification challenge is critical to guarantee that the best analysts in the field see no reason that the theory is not true. Without this, one has only pseudoscience. Even still, scientific truth can be overturned if new evidence is found that does not fit the model.

There are basically three kinds of science. In the "hard sciences" (e.g., chemistry, physics), it is possible to isolate the entity being studied (e.g., oxygen atoms) from the environment, thereby eliminating interferences. Experimenters then hold constant all independent variables except the one of interest (e.g., temperature) to study a dependent variable (e.g., pressure). The experiments can be exactly duplicated by others with similar equipment, thereby removing investigator bias and providing an easy way to falsify incorrect theories. Scientific models are developed using mathematical models that seem to fit the evidence. The mathematical models are reliably valid, but the scientific models they are used to underpin might not be. Mathematical models are completely under the control of mathematicians, but natural phenomena are under the control of the LORD, not scientists. In general, models in the hard sciences do not pose a challenge to a Christian's faith.

Researchers can also do experiments in the "soft sciences" (e.g., psychology, pharmacology), but they cannot completely isolate the entity being studied (e.g., drug metabolism) from other factors (e.g., emotional stress). Experimental environments are extremely complex because they involve living beings that respond to multiple equilibria and stimuli with various reaction speeds. Experimental results are often sensitive to the exact composition of the population (e.g., age, sex, culture, disease status) being studied. Repeating experiments can therefore yield significantly different results. This is why medical guidelines often change. Because it is so susceptible to variations in experimental conditions, "scientific truth" from the soft sciences is not nearly as reliable as that from the hard sciences. Challenges raised by the soft sciences to Christian beliefs include the way researchers conduct experiments on living beings (particularly on humans), the methods they use to collect their research materials (e.g., aborted fetuses) and their assumptions about the nature of man (e.g., capable of moral improvement).

Finally, in observational science (e.g., astronomy, paleontology), the investigators are limited to what they happen to encounter. They can search where they hope to find new or confirmatory information, but they cannot produce new cases to study through experimentation. For example, economists cannot start financial depressions to experiment with methods of recovering from them, and astronomers cannot create new earthlike planets to test their models. Because its models often change due to new discoveries, the reliability of observational science research is generally overstated in the media. Theories of macroscopic evolution which are inconsistent with the Bible come primarily from the observational sciences. Since there is no rigorous way to test observational science models, they will always remain relatively weak. Moreover, any effort to introduce acts of God into such models (e.g., creation science) makes them completely unfalsifiable and turns them into pseudoscience.

When we are dealing with something that is claimed to be scientifically true, it is essential that we look at the type of science that is involved and ask, "Is it reproducible?" "Can it be tested by falsification?" While all scientific models are somewhat fragile, susceptible to being overturned by new discoveries, scientific truth in the hard sciences is much more reliable than in the soft sciences and much more testable than in the observational sciences. The Christian should not be troubled by "scientific truth" because it is only a human explanation of the world. The LORD is in control. Everything that is inanimate does nothing without His command (Matthew 5:45), and everything that is animate does nothing without His permission (Isaiah 14:27).

Appendix V

Comparison of Truths

Research scientists and confessional Christians both have firm convictions about how the universe and life began. It is clear, however, that they strongly disagree. Why is this true? To understand their disagreement one must look at the assumptions that lead to their conclusions.

The function of basic science is to create models (theories) that explain how the things that are observed in the world work. For example, why is an apple observed to fall? Scientific models usually include assumptions, equations, logical expressions and limits of applicability. To build such models scientists use what is called the "scientific method." When they observe an event, they weigh, count and measure whatever appears to be related to the event. After gathering data from several events, they create a model to explain the data. They use the model to predict what will happen in yet untested cases. They observe these cases and refine their model if the observed results are different from those predicted by that model. This cycle is repeated until they conclude their model is good enough for its intended usage.

While each model has its own assumptions associated with it, all scientific observations have three underlying assumptions. First, scientists assume there are reliable measuring instruments and reference standards available that they can use to make the measurements of events. If rulers or scales cannot be calibrated against unchangeable standards, their measurements cannot be compared. Second, scientists assume the measuring process does not affect the events being measured. If measuring the speed of a motor can only be done by retarding its motion, one cannot tell how fast the motor is actually going. **Third and most basic, scientists assume that all activities they observe are solely the result of the interaction of the laws of nature and the inherent properties of matter and energy.**

Scientists have been very successful at explaining many observations made in nature by their models. Their success has produced the great technological advancements that we see. Comparing today's world with the world of 1810 shows astounding technological progress in almost every area of life. Some scientists therefore have assumed that they can also successfully build models to explain the origins of life and of the universe. There certainly are enough fossils, geological strata, mineral and fuel deposits, variations in life forms and extra-terrestrial objects for them to measure and contemplate. Science is, however, faced with three underlying problems in this effort.

First, the most basic assumption of science says, in effect, "There is no God nor are there other supernatural beings." Suppose a woman is trying to bake ten dozen chocolate chip cookies. Also suppose several hungry teenagers periodically wander into her kitchen and grab some of the cookies. As a consequence, she cannot know how many cookies she will have when she finishes baking. If any of the observations that scientists make are the result of God acting by supernatural means, their models will be unreliable at explaining events. The existence of God renders even the best scientific model only as reliable as God wants it to be. Scientists who are Christian understand this.

Second, science is limited by sample size. If a scientist claims no one can speak Mongolian and finds that the first million people he asks cannot speak it, has he proved his claim? Of course not! Models that have been "proved to be correct" must often be modified or discarded when events occurring under other conditions are observed. No model can be deemed completely accurate unless it is tested under all possible scenarios, that is, by exhaustive analysis. This is usually impossible because of the size and diversity of the universe. The truth of any scientific model is therefore always the prisoner of the next observation.

Third, just because a model is viable, does not mean it is correct. If I see someone eating breakfast in St. Paul and see him in the evening in Chicago, I might theorize that he has flown between the cities. It is a viable model, but he could have driven or taken a bus or train instead.

The Christian's primary concern is his relationship to God. That relationship is based on his belief in the saving work of Jesus Christ. Yet we cannot know Jesus except through the Scriptures. **Therefore the primary assumption of Christianity is that the Bible is the inerrant, verbally inspired Word of God.** It is the standard by which all teachings are judged.

The Bible tells us about the LORD. He is the God who has all the power and all the knowledge that exists. He is present everywhere, and He fills all time. The Bible says He created the universe and organized it during a six-day period, using only His word. He created man in His own image, giving him a physical body and a soul which is not physical. He established the laws of nature. Everything God created was perfect. The Bible also says God cursed the world because man sinned. When man's sinning became worse, He destroyed most living creatures through a universal flood. He later confused man's language when man became arrogant. During these, and perhaps other, times God intervened in the world outside the laws of nature, using only His word to effect change.

There are many things about our world that the Bible does not tell us. For example, did God create fossil fuels under the earth's crust in the first six days or later? If later, did He use His almighty word or the laws of nature to form them? Did He create all the land masses and rock strata initially? Or did He change the earth later? Did all those fossilized animals really live? Or did the LORD place them about like a director puts props on the stage for the purposes of the play? Might some form of life have evolved if God had created a primitive world four billion years ago instead of a developed world only a few thousand years ago? The Bible doesn't answer these and numerous other questions. Concerning the world's origins, just as with other Biblical teachings, we dare say no more and no less than what the Bible says.

Can any scientific approach help us understand how God created the world? No. When God acts through His word, as He did in the early history of the world, He violates the basic assumption of science. That makes the scientific method useless. Why is this so? The basic assumption specifically forces the exclusion of any supernatural involvement from scientific models. How can anyone know all the actions that God performed supernaturally so as to exclude them? In fact, trying to use scientific modeling to explain or to justify creation is a trap. Models devised by creationists are subject to the same three underlying problems mentioned previously that evolutionists face. It is foolish to jump off the solid rock of Biblical revelation to do battle in the quagmire of scientific uncertainty.

The writer to the Hebrews (11:3) says "By faith we understand that the universe was formed at God's command, so that what is seen was not made out of what was visible." We believe that the LORD made the world in six days because the Bible says so and for no other reason.

Science and Christianity

I. The Nature of Truth

A. The standard of truth

1. How do we know what truth is?
   a. How do we understand Pilate's question – "What is truth?" John 18:38
   b. How do we understand Jesus' statement – "You will also know the truth, and the truth will set you free." John 8:32

2. Is the measurement by weight or by volume?
   a. Weight and volume are two completely different standards for measuring liquids. If one mixes one pound of water with one pound of alcohol, one has two pounds of product. If one mixes one liter of water with one liter of alcohol, one does not have two liters of product.
   b. Things are different still if one mixes one mole of water with one mole of alcohol.

3. Is the measurement by meter or by yard?
   a. Meters and yards are both measurements of length, but they cannot be used interchange-ably.
   b. Conversion between systems of units can cause misunderstandings and can be error-prone. How fast is 28.3 meters per second in furlongs per fortnight?

B. Need for a method for determining truth

1. An element or entity that everyone can agree upon.
   a. Such an element or entity is often called a **fact**.
   b. For example, "the tight end physically caught the football."

2. A method of determining the relevance of the fact.
   a. The method of determination is comparing it to a **rule**.
   b. Rules must be complementary and not conflicting.
   c. "Was the catch legal because the ball was caught inbounds?" Note that the decision might be different in college or professional football because the rules are different.

3. A means to challenge the correctness of the decision.
   a. The way to resolve whether a matter was judged correctly is often called the **review process**.
   b. A review process must be performed by someone other than the person who applies the rules.
   c. A football coach may throw a challenge flag to request a detailed review of the "catch."

4. Facts, rules, and review processes must be independent of each other.
    a. Rules cannot be used to generate facts.
    b. The review process cannot introduce additional facts.
    c. The review process cannot change the rules.

C. Four ways to look for truth

1. That which is self-evident (e.g., philosophy, politics)

2. That which results from deductive reasoning (e.g., mathematics, formal logic)

3. That which is revealed supernaturally (e.g., theology, morality)

4. That which results from inductive reasoning (e.g., science, scholarly research)

D. The nature of philosophy

1. On what is philosophy based?
    a. Philosophy is the use of the human mind to attempt to understand why entities exist and how events involving entities occur.
    b. The basic assumption of philosophy is that some things are so obvious (e.g., self-evident) that they can be used as the underpinnings (e.g., first principles, fundamental assump-tions) of all human reasoning.
    c. It was for this reason, the need to have ground on which to stand, that René Descartes made his famous statement, “I think; therefore, I am.”
    d. Philosophy claims that the conscious mind is capable of determining the first principles that are necessary to philosophize and of applying the rules of logic to discover truth.

2. The problem of self-evidence
    a. What is self-evident to one person might not be self-evident to another. For example, Thomas Jefferson’s statement that “all men are created equal” in the Declaration of Independence might very well be responded to by the question, “Equal in what way?” The meaning of “equality” has been and continues to be grist for the political mill.
    b. Some things that are self-evident are probably false. For example, it was self-evident to Aristotle that heavier objects fall faster than lighter objects, but Galileo proved this is not true.
    c. What is “self-evident” may be strongly influenced by people’s culture, that is, people’s sense of truth may be set very early in life before they reach the “age of reason.”

3. The truth-determining mechanisms of philosophy are weak.
    a. To move forward in establishing truth in a system of reasoning, the fundamental items which are going to be considered (i.e., facts) must be agreed upon by everyone. Because the same things are not self-evident to everyone, disagreements over what propositions can be generally accepted as true are common, preventing progress in philosophizing.

b. To address this issue, definitions are loosened to get agreement so the rules can be applied. This, however, effectively makes the rules dependent on how the facts are defined. Both facts and rules are diluted to get an acceptable conclusion.

c. The resolution process normally involves experts who were not part of the rule-application process. But since both the facts and the rules cannot be independently established, any resolution is arbitrary.
d. The numerous schools of ancient philosophers, all seeing the same world but reaching greatly different conclusions, illustrate the weakness of philosophy. There were five ancient Greek schools (Platonism, Aristotelianism, Stoicism, Epicureanism, and Skepticism), and there are four modern schools (Idealism, Realism (Modernity), Postmodernism, and Pragmatism)

4. The psychological issues
   a. Philosophers believe the conscious brain makes humans superior to other species and has an almost limitless capacity to reason and learn.
   b. In reality, the conscious mind is slow and tires quickly. It requires significant training in discipline to keep the subconscious mind under control. Moreover, because of its slow-ness, it must hand over important tasks to the subconscious.
   c. The subconscious mind does parallel processing of all the sensory inputs. To accomplish this, it must create and master numerous scripted responses. This makes the subconscious highly biased to scenarios that it can understand. While it can be trained by the conscious mind to some extent, most of its learning comes from experience.
   d. The subconscious mind thinks so much faster than the conscious mind that most ideas that a person has are actually produced by the subconscious mind at least 0.3 seconds before the conscious mind realizes that a decision is being made. The conscious mind is forced to override these "automatic" decisions, which is like herding cats.
   e. Long-term memory is notoriously unreliable because some of its memory frames are corrupted by placeholders which were never actually observed when events occurred and because it is self-editing to improve personal self-image.

5. Summary of philosophy
   a. The operative phrase of philosophy is "It seems reasonable to me that…." Because philosophy is "I-centered," it gives people a sense of freedom and of being masters of their own fate when they feel they have determined truth through philosophizing.
   b. When faced with challenges in one of the other methods of seeking truth, people are always tempted to philosophize to gain control of the situation and to appear to be brilliant problem-solvers.
   c. St. Paul wrote, "See to it that no one takes you captive through philosophy and empty deceit, which are in accord with human tradition, namely, the basic principles of the world, but not in accord with Christ." Colossians 2:8. This is a stern warning against basing any decision of significance on philosophy.

E. The nature of deductive reasoning

1. What is the basis of deductive reasoning?
    a. Creating a domain in which deductive reasoning will be done is a human activity. For example, the domain of integers is the result of human definition. It is said that such a domain is human-owned.
    b. For deductive reasoning to be applicable within a particular domain, all aspects of the domain must be created using universally accepted definitions. For example, “For every integer there is another integer that has a value that is one unit greater.”
    c. Any “facts” or rules that are not universally accepted cannot be used in the reasoning within the domain. For example, “The square root of any number is one half of that number.”
    d. Domains therefore are totally controlled by those who define them. Anyone who does not accept the domain definitions cannot work within that domain.
    e. Multiple domains, such as card games, can be defined using the same elements (e.g., the cards).

2. The truth-determining mechanisms of deductive reasoning
    a. The elements (facts) are unambiguously defined. Therefore, everyone studying a domain will be starting with the same information.
    b. Rules are clear and independent of facts. For example, the sum of two numbers is rigorously defined, and the use of the operation of summing does not change the addends in producing the sum.

    c. No matter who checks the work done in deductive reasoning, the resolution processes always yield the same result. They work infallibly.
    d. Everything in a domain always works the same no matter where it is employed or the type of government that rules the country.
    e. The operative statement of deductive reasoning is “Based on the definitions of the domain, it follows that....”

F. Mathematics as an example of deductive reasoning

1. What is mathematics?
    a. While nature was the inspiration for mathematics, mathematics really has nothing directly to do with nature. It is a human-devised system which is defined independent of anything in nature.
    b. Mathematics consists of a series of symbols to which relative values are assigned. For example, “1” is assigned as a basic unit. “2” is defined as the next symbol in the progression after “1.” “3” is defined as the next symbol after “2,” etc. The distance between adjacent symbols in this progression is then defined as “1” unit. These are called the “counting numbers” or the “positive integers.”
    c. It is clear how the counting numbers can be matched to the elements of some material objects to allow a unique symbol to be assigned to the amount present (e.g., 24 apples).

d. Operators such as (“+”, “-“, “·”, and “/”) permit the creation of rules that allow the values of two symbols in a domain to be combined in such a manner that they can be represented by another symbol in the domain.
e. Many mathematical domains can be created using different symbols and operations with different functions. As long as they are properly defined, the result of an operator on the elements of the domain will give a unique answer that is also within that domain.

2. Characteristics of mathematical domains
   a. All elements of a mathematical domain are unambiguously defined and universally accepted. If two elements have the same value, they are defined as equivalent.
   b. Rules are also universally defined based on the operators that exist in the domain. Operators always yield the same value within the system for the same inputs. They work infallibly provided human error is not involved.
   c. If two processes of applying operators yield the same result on the same set of inputs, then the processes are equivalent and can be used interchangeably.
   d. Two domains in which the elements and the rules correspond exactly to each other are called “isomorphic,” and the corresponding sequence of operations must produce isomorphic results.

3. Types of mathematics
   a. Algebraic domains involve numbers, operators, and symbols to represent general terms to which a value cannot yet be assigned (e.g., $y = x + 4$).
   b. Geometric domains involve figures such as triangles and spheres which exist and which are defined within a certain realm, such as a plane or 3D. The properties of geometric figures remain proportional regardless of the size of the figure.
   c. Topological domains involve the properties of surfaces which exist in spaces that have more than two dimensions (i.e., a coffee cup, a Klein bottle).
   d. A domain of sets involves members which are composed of other members (and sometimes themselves) and which can be taken apart and joined together by set operators (i.e., Concat({K, 57, cherry},{dog, 26}) = {K, 57, cherry, dog, 26}).

G. Logic as an example of deductive reasoning

1. Syllogistic logic combines a major premise and a minor premise to reach a conclusion (e.g., All living dogs have heads. Buffy is a living dog. ∴ Buffy has a head.)

2. Truth tables are used to determine if all possible combinations of true and false values for the elements produce the same pattern for both sides of an equation (e.g., Does $A \wedge \neg B = \neg A \vee B$?).

3. Predicate calculus transforms real problems into logical expressions using mathematical symbols and logical operators. The symbolic representation of the problem is independent of the emotional baggage that is often associated with real problems, and the solution of the symbolic problem can be translated back into the solution of the real problem.

H. Conclusions

1. Philosophical reasoning is always suspect and seldom conclusive. It is completely dependent on the people doing the reasoning and the assumptions that they make.

2. Deductive reasoning is always reliable where it can be applied. The assumptions are univer-sally accepted, and the operators always work in the same manner.

3. While deductive reasoning can be used in science and theology, it can contribute no new information that was not already present in the evidence of science or the revelation of religion.

4. Neither philosophy nor deductive reasoning can probe the hidden things of God.

In theology, reason is only a handmaiden, never the queen.

403 – I Know My Faith Is Founded

I know my faith is founded
On Jesus Christ, my God and Lord;
And this my faith confessing,
Unmoved I stand upon his Word.
Man's reason cannot fathom
The truth of God profound;
Who trust in worldly wisdom
Relies on shifting ground.
God's Word is all-sufficient,
It makes divinely sure,
And, trusting in its wisdom,
My faith shall rest secure.

Science and Christianity

II. The Nature of Christianity

@. Review

1. Philosophical reasoning is always suspect and seldom conclusive.

2. Deductive reasoning is always reliable where it can be applied.

3. No form of human reasoning can probe the hidden things of God.

A. What is theology?

1. Theology has a "divine" basis.
   a. For theology to be different from philosophy, it must be based on a different source of truth. It cannot rely on self-evident truth, but it must rely on truth revealed by God.
   b. If the revelation of God is based on a written document which was given to one or more chosen people by God or directly presented by God in written form, then theology has a firm base of definition as exists in deductive reasoning.
   c. If the "revelation" of God is based on oral information passed down from one generation of priests, rabbis, teachers, etc. to the next, then it is uncertain whether what is now taught is what God revealed or whether the transmitters of the revelation introduced errors. This revelation is always uncertain.
   d. If priests, rabbis, teachers, etc. claim to be continuing to get revelation from God, then the standard of faith is forever uncertain because it can change at any time.

2. The Christian's source of revelation
   a. All spiritual truth is based on the revelation of God which has been given in the Old and New Testaments of the Bible, namely on "Thus says the LORD…."
   b. "All Scripture is God breathed and is useful for teaching, for rebuking, for correcting, and for training in righteousness, so that the man of God may be complete, well equipped for every good work." 2 Timothy 3:16–17

3. Everything the Scriptures say is true.
   a. Facts are based on divine revelation and are therefore reliable.
   b. "So Jesus said to the Jews who had believed him, 'If you remain in my word, you are really my disciples. You will also know the truth, and the truth will set you free.' " John 8:31
   c. "To the law and to the testimony! If people do not speak according to this word, there will be no dawn for them." Isaiah 8:20

4. Scripture is understood through the rules of hermeneutics.
    a. The primary rule is that the text is literal except when context indicates otherwise.
    b. "Your words are a lamp for my feet and a light for my path." Psalm 119:105

5. The resolution process is "Scripture interprets Scripture."
    a. In the resolution process, human reason cannot be used in a manner so as to add anything to or delete anything from what has been written.
    b. "We also speak about these things, not in words taught by human wisdom, but in words taught by the Spirit, combining spiritual truths with spiritual words." 1 Corinthians 2:13
6. Deviations from this standard.
    a. Roman Catholics deviate from this standard by claiming that not all the truth was written down by the apostles but that some was given to the bishops of the church and has been revealed in the writings of the fathers and that this must be reconciled with the Scriptures by the teaching office of the church.
    b. Some Protestant churches believe that human reasoning must be the resolution process which the church uses to understand the Scriptures.
    c. Some Protestant churches believe that God is continuing to reveal His will for man by moving the hearts of people in every generation to understand the Scriptures as they are to be applied in the social environment of that generation.

B. The nature of God - Omnipresent

1. God fills the whole universe.
    a. The LORD filling the universe is not a matter of His size. Space is a creation of the LORD, who is a spirit, so there is no common system of measurements between God and the universe that can be applied to both.
    b. David wrote, "Where can I go from your Spirit? Where can I flee from your Presence? If I go up to heaven, you are there. If I make my bed in hell—there you are! I rise on the wings of dawn. I settle on the far side of the sea. Even there your hand guides me, and your right hand holds on to me. And if I say, 'Surely the darkness will hide me and the light will become night around me,' then even the darkness will not be too dark for you. The night will be as light as the day. Darkness and light are the same to you." Psalm 139:7–12

2. God is completely present at each point.
    a. Physical objects can only be present at one place at a particular time. God does not have this limitation. It is as if He maps Himself to every point in the universe so that He is completely there, not just a part of Him being there.
    b. "The eyes of the LORD are everywhere, watching evil people as well as the good." Proverbs 15:3

3. God exists independently of the universe.
    a. In physics the speed of light is independent of the frame of reference in which it is measured. In the same way the gestalt of God is the same no matter from where we attempt to interact with Him.

b. "'Can anyone hide in secret places so that I cannot see him?' declares the LORD. 'Do I not fill heaven and earth?' declares the LORD." Jeremiah 23:24

4. God fills the heavenly realms.
   a. The LORD not only fills the physical universe, as difficult as that is to understand, but he also fills the realms of heaven which we have no ability to explore or understand. He therefore knows how to provide for His elect both here and in the realms beyond here.
   b. "Therefore know this today and again take it to heart that the LORD is God in the heavens above and on the earth below. There is no other." Deuteronomy 4:39

C. The nature of God - Invariant

1. God has always existed and will always exist.
   a. God is the only absolute that there is. All else had a beginning and will change at some time during its existence, but not God. In a world where every aspect of nature has the ability to change, even the climate, the LORD is, and He cannot be otherwise.
   b. Moses said, "Before the mountains were born, before you gave birth to the earth and the world, from eternity to eternity you are God." Psalm 90:2

2. God is not a creature of time.
   a. Time is an entity. It flows in one direction, like a stream, but its flow is not uniform. Under some conditions it flows faster than under others. Nevertheless, time had a beginning so that for some point there was nothing before it, and time can end so that there will be some point after which there is nothing. The LORD exists even where time does not flow.
   b. "So God replied to Moses, 'I AM WHO I AM.' He also said, 'You will say this to the Israelites: I AM has sent me to you.' " Exodus 3:14
   c. "Certainly I, the LORD, do not change. That is why you, sons of Jacob, have not come to an end." Malachi 3:6

3. God cannot change.
   a. The certainty of the Christian faith is that God cannot change. What He promises today is fulfilled in our future but in God's "eternal now." His speaking and His acting are the same.
   b. At God's command, Balaam said, "God is not a man, that he should lie, nor a son of man, that he changes his mind. Does he say something, and then not carry it out? Does he speak, and then not bring it about?" Numbers 23:19
   c. "But do not forget this one thing, dear friends: For the Lord, one day is like a thousand years, and a thousand years are like one day." 2 Peter 3:8

4. God knows even those things that might occur.
   a. God's knowledge of what will happen in time is so great that He even knows what would happen if He allowed the circumstances in the world to be different. He can protect us by not leading us to where we would fall into sin.

b. "LORD, you have investigated me, and you know. You know when I sit down and when I get up. You understand my thoughts from far off. You keep track of when I travel and when I stay, and you are familiar with all my ways. Before there is a word on my tongue, you, LORD, already know it completely." Psalm 139:1–4

D. The nature of God - Omniscient

1. God knows everything in the universe.
   a. God's knowledge is synonymous with His existence. Because He is everywhere and everywhen, He is aware of everything.
   b. "There is no creature hidden from him, but everything is uncovered and exposed to the eyes of him to whom we will give an account." Hebrews 4:13
   c. Joseph said, "You meant evil against me, but God meant it for good, to bring this to pass and to keep many people alive, as it is this day." Genesis 50:20

2. God authorizes and sustains all activities that occur.
   a. God's sustaining presence is literally why everything in the universe exists and functions.
   b. "He counts the number of the stars. He calls them all by name. Great is our Lord and mighty in power. To his understanding there is no limit." Psalm 147:4-5
   c. Jesus said, "Even the hairs of your head are all numbered." Matthew 10:30

E. The nature of God - Omnipotent
1. God has all the power.
   a. The LORD is not just more powerful than anything else; He has all the power that exists, and He delegates power to other things so that they can act.
   b. "For the LORD of Armies has made plans, and who can stop him? His hand is stretched out, and who can turn it back?" Isaiah 14:27
   c. "Jesus approached and spoke to them saying, 'All authority in heaven and on earth has been given to me.' " Matthew 28:18

2. God is capable of doing anything consistent with His will.
   a. Whatever the LORD wills, He has the power to make it happen.
   b. The angel Gabriel said, "For nothing will be impossible for God." Luke 1:37
   c. "The LORD does whatever he pleases in the heavens and on the earth, in the seas and in all the depths." Psalm 135:6

3. Nothing exists, acts, or moves without God's permission.
   a. Nothing inanimate, regardless of size, acts without God's command; nothing animate, no matter how powerful and clever, acts without God's permission.
   b. "If the LORD does not build the house, it is useless for the builders to work hard over it. If the LORD does not watch over the city, it is useless for the watchman to stand guard." Psalm 127:1

4. The laws of nature function only as God wills.
    a. Nature appears to have laws only because the LORD normally chooses to act in a manner that is predictable to human minds. He is not bound by such laws.
    b. David wrote, "The eyes of all look eagerly to you, and you give them their food at the proper time. He opens his hand, and he satisfies the desire of every living thing." Psalm 145:15-16
    c. "You will take a lot of seed out to the field, but you will harvest little, because locusts will finish it off. You will plant and tend vineyards, but you will not drink the wine and store it, because worms will eat them up. You will have olive trees covering your whole property, but you will not anoint yourselves with oil, because your olives will fall off the trees." Deuteronomy 28:38-40

F. How God works

1. God works through miracles (non-natural hand).
    a. The LORD works through miracles when He chooses to exercise His power without any effort to hide it under ways the things of this world are regularly seen to behave.
    b. The plagues in Egypt. Exodus 7:19-12:32
    The parting of the Sea of Reeds. Exodus 14:21-28
    The crossing of the Jordan on dry land when it was at flood stage. Joshua 3
    The sun standing still. Joshua 10:12-13
    An entire army struck with blindness. 2 Kings 6:18
    The slaughter of the Assyrian army before Jerusalem. 2 Kings 19:35
    c. The announcement of the birth of John the Baptist. Luke 1:5-25, 1:57-66
    The virgin birth. Luke 1:26-38
    The calming of the lake. Matthew 8:23-27; 14:25-32
    The feeding of large crowds. Matthew 14:19-21; 15:35-38
    The raising of the dead. Luke 7:11-15; Mark 5:35-43; John 11:1- 44
    The deliverance of Peter. Acts 12:7-17

2. God works under the guise of the laws of nature (natural hand).
    a. The LORD most often works through and under the shadow of the laws of nature so that people reap the benefits of His action without seeing His fingerprints on His work.
    b. The Lord told Adam that the ground would produce thorns and thistles. Genesis 3:18
    The LORD directed David's stone that killed Goliath. 1 Samuel 17:49
    The Lord put a spirit in Sennacherib's mind so he returned to his own country. Isaiah 37:7
    c. God's sun shines and His rain falls on the righteous and the unrighteous. Matthew 5:45
    The end of the world will be signaled by great signs in heaven and on earth. Luke 21:11
    A terrible storm swept down on Paul's ship. Acts 27:18

3. God created the world in six days by miraculous means.
    a. Again and again in Genesis 1, God spoke and at His word things came into being and functioned properly. Everything was perfectly made for the purpose He created it.
    b. "For in six days the LORD made the heavens and the earth, the sea, and everything that is in them, but he rested on the seventh day." Exodus 20:11
    c. "Lift up your eyes to the heavens and see who created these things. See who brings out their army in great number and calls them all by name. Because of his great strength and mighty power, not one of them is missing." Isaiah 40:26
    d. "This is what the true God says, the LORD who creates the heavens and stretches them out, who spreads out the earth and everything that it produces, who gives breath to the people on it and life to those who walk on it." Isaiah 42:5
    e. "For in him all things were created, in heaven and on earth, things seen and unseen, whether thrones or dominions or rulers or authorities; all things have been created through him and for him." Colossians 1:16

4. God preserves the world He created.
    a. The creation of God is continuous in that He preserves His creation in the same way in which He brought it about, namely, through the power of his word.
    b. "The Son is the radiance of God's glory and the exact imprint of the divine nature. He sustains all things by his powerful word." Hebrews 1:3
    c. The LORD said, "While the earth remains, seedtime and harvest, cold and heat, summer and winter, and day and night shall not cease." Genesis 8:22
    d. Paul said, "He himself gives all people life and breath and everything they have." Acts 17:25

5. We are limited in what we know by God's revelation.
    a. Because God is not a part of the physical world, our senses and measuring instruments cannot learn anything about Him. We must rely solely on His revelation.
    b. "Who has directed the Spirit of the LORD? Who can teach him anything or serve as his advisor? Who was his advisor to give him insight? Who taught him the path of justice? Who taught him knowledge? Who showed him the way to complete understanding?" Isaiah 40:13–14
    c. " 'Certainly my plans are not your plans, and your ways are not my ways,' declares the LORD. 'Just as the heavens are higher than the earth, so my ways are higher than your ways, and my plans are higher than your plans.' " Isaiah 55:8–9
    d. "What no eye has seen and no ear has heard and no human mind has conceived—that is what God has prepared for those who love him." 1 Corinthians 2:9

Theology is absolutely certain only if you believe the correct one.

252 – Oh, Sing to the Lord

Oh, sing to the Lord, make a jubilant noise!
Glory be to God!
Oh, serve him with joy; in his presence now rejoice!
Sing praise unto God out of Zion!

Not we but the Lord is our Maker, our God;
Glory be to God!
His people we are, and the sheep led by his rod;
Sing praise unto God out of Zion!

Oh, enter his gates with thanksgiving and praise;
Glory be to God!
To bless him and thank him our voices we will raise;
Sing praise unto God out of Zion!

For good is the Lord, and his mercy is sure;
Glory be to God!
To all generations his truth shall still endure;
Sing praise unto God out of Zion!

Science and Christianity

III. The Nature of Science

@. Review

1. Philosophical reasoning is always suspect and seldom conclusive.

2. Deductive reasoning is always reliable where it can be applied.

3. Theology is absolutely certain only if you believe the correct one.

A. The history of science

1. Natural philosophy
   a. Greek philosophers, such as Plato and Aristotle, glorified the power of the human mind and tried to develop self-consistent systems to understand the ideas, the objects, and the activities that they observed in the world.
   b. As all philosophers, they believed in self-evident truth. Certainly, through thought, they reasoned, they could understand the universe.
   c. They came to believe in the "one-truth" thesis. According to this thesis, all truth was interconnected. No matter where one started, one could eventually learn all truth by finding and following the interconnected pathways.
   d. Reasoning about the objects and rules of nature was called "natural philosophy" and, like all philosophy, it was undertaken completely through mental activity.

2. Astrology
   a. Nothing impressed the ancients more than astronomy. They looked at the huge expanse of the sky and wondered about the objects they saw there. They were particularly interested in how the sky rotated and why some objects moved relative to the rest of the sky. They placed stars that were near each other into constellations and identified the "moving stars" which they called "planets."
   b. They believed that what they saw in the sky had a purpose. Being superstitious, many of them believed that the relative movement of the planets and the stars at critical times, such as when a person was born or married, affected various aspects of their lives. This fantasy, called "astrology," still has many adherents today.

3. Alchemy
   a. The stars were beyond man's control, but people gradually learned that they could extract metals from rocks, combine them with other metals to create alloys, and make utensils and weapons of war from these metals directly or from their alloys.
   b. They also learned that certain plants had medicinal benefits, and those benefits could be enhanced by extracting the active ingredients and concentrating them.

c. It seemed to some that it was merely a matter of trial and error or of magic to find ways of changing something of low value (e.g., ore) into something of higher value (e.g., pure metal). Alchemists therefore began seeking ways of creating precious materials (e.g., gold) out of cheap metals (i.e., lead). “Patent medicines” are an example of modern alchemy.

4. Experimental science
   a. A few Greeks did try to determine information about nature through experimentation, but these were mostly mathematicians rather than philosophers. For example, in 240 BC, Eratosthenes used shadows to determine the circumference of the Earth to within 2% of its actual value.
   b. In 246 BC, Archimedes discovered how to measure the relative density of objects.
   c. The engineering and construction of military weapons involved studying bow-strength and ballistic trajectory. This occurred over many centuries, often without people understanding the science behind them.
   d. The modern era of experimental science is generally dated to Galileo Galilei about the beginning of the 17th century. He conducted experiments in a systematic manner and accurately recorded his results.
   e. The ability to understand the information gathered by scientific observations was quite limited before Isaac Newton. Newton developed the calculus and used it to show that the whole universe operated on the same set of laws, not on separate sets of celestial and terrestrial laws.

B. What is science?

1. Science has a “divine” basis.
   a. Science differs from deductive reasoning because the natural realm in which science works is completely defined independently of the investigators. The universe is as it is, and scientists can only measure its components and attempt to learn the rules that relate them. They can define neither the components nor the rules.
   b. Science differs from theology because while both nature and the Bible represent revelations from God, the Bible explains how its revelation is to be understood, but nature comes with no divine manual. Scientists must attempt to establish its operations manual through their investigations.
   c. Science differs from philosophy because its source of truth is different. Something that seems self-evident to the philosopher (e.g., that heavy objects fall faster than lighter objects), can be seen to be totally false when scientific experimentation is performed.
   d. Science is based on inductive reasoning. Evidence is systematically collected and documented, and that evidence, which is always only a minuscule amount of the possible evidence available, is used to develop theories to explain how all the other pieces of evidence that were not collected will behave.

2. Developing the framework
    a. Because in science the goal is to learn the rules (i.e., laws) of the system that the investigator is studying, the investigator must make some fundamental assumptions upon which all his or her work will depend.
    b. The fundamental assumption undergirding all the physical and biological sciences is that all observed phenomena can be understood in terms of the inherent properties of matter, energy, space, and time. To play the science game, one must accept this assumption, at least as a working hypothesis.
    c. The fundamental assumption, and any assumptions subsequently made, might be false. In fact, it is not uncommon for scientific assumptions to be wrong because scientists cannot see the whole picture of nature.

3. Facts are the things observed.
    a. Science is based on evidence that is obtained by making controlled observations of nature. These observations must meet preestablished standards for quality and be documented so that they can be reproduced and/or compared.
    b. The evidence collected must be appropriately sampled to be representative of the population of being studied. There can be no "cherry-picking" to bias the results in a particular direction.
    c. The amount of evidence much be large enough so that the results are statistically significant.
    d. A science is regarded as "hard" if it is experimental and if the variable of interest can be isolated from all other variables (e.g., elemental analysis). Experiments can be precisely duplicated by other scientists.
    e. A science is regarded as "soft" if it is experimental and if, although the variable of interest cannot be isolated, the other variables can at least to some extent be controlled (e.g., drug studies). Similar, but not identical, experiments can be performed by other scientists.
    f. A science is regarded as "observational" if investigators cannot perform experiments but must rely on what they discover (e.g., archeology). Those not present when a discovery is made might only have the documentation of the discovery by which to judge its merit.

4. The resolution process is called "falsification."
    a. The evidence, or the documentation of the collection of the evidence, is reviewed by experts in the field.
    b. The validity of the sampling process is reviewed to determine if the sample is representative of the population being studied.
    c. Any statistical evaluation of the evidence is reviewed for appropriateness.
    d. Efforts are made to duplicate the experimental conditions to determine if the results can be reproduced.
    e. The theory or explanation proposed to describe the results is tested on other members of the population which were not part of the sample used for developing the theory.

5. The reliability of scientific truth
    a. A scientific theory, model, or law is regarded as scientifically true if one can say that it is "consistent with the available evidence."
    b. All scientific truth is only "provisional" because new evidence could undermine the reliability of the theory, model, or law.

C The scientific method in theory

1. Observe a phenomenon
    a. When something natural is observed, document the observation for later comparison with other instances that might be related.
    b. Establish experiments to produce other instances, if possible.
    c. Search the natural environment or the literature to find other related observations.

2. Create a model to explain observations.
    a. Attempt to create a logical explanation based on the evidence available.
    b. If possible, develop a mathematical model which explains the relationship among the pieces of evidence.

3. Test the model under more conditions.
    a. Use the model to predict other cases of the phenomenon of interest that have not yet been observed.
    b. Seek to find additional cases to test the predictiveness of the model either through experimentation, search of the physical world, or search of the literature.

4. Refine or reject the model.
    a. If the model seems to be basically correct, refine the model based on the new information and return to step three to repeat the process until no more refinements are needed.
    b. If the model fails to accurately explain new cases, return to step one or step two as necessary and repeat the process.
    c. If the model becomes hopelessly inadequate, reject it and change careers.

D. How science really works

1. A scientist develops and tests a model. This may require many passes through all or part of the steps of the scientific method to create an acceptable model.

2. The model is presented to the scientific world. This is the point at which the falsification process begins. Scientists are kept honest by this step because they each would like to find something wrong with the model to show that they are better scientists than the one who proposed the model.

3. The model is carefully scrutinized by the experts as described above, looking for obvious errors, such as inadequate evidence, faulty analysis, flawed logic, or experimenter bias.

4. The model is tested by other scientists under other conditions. When possible, scientists set up their own experimental equipment and test the model to see how it performs in their labs.

5. The model becomes a "strong" model or is rejected. If the model survives the initial on-slaught of examination, it is then provisionally accepted as a possibly correct explanation of the phenomenon. Over time as others use it, its credibility can grow. If shortcomings are found or limitations of the model are revealed, it fades from the scientific scene.

E. Implications of the primary assumption of science

1. All natural phenomena have natural explanations.
   a. Simply because something cannot not be explained now does not mean there is no natural explanation.
   b. If there is no definitive experiment between two explanations, then either or neither, but not both, of them may be correct.

2. There are no supernatural beings. (Corollary 1)
   a. If there is a supernatural being who can affect objects and/or processes in the physical world, then the fundamental assumption of science is wrong.
   b. If the fundamental assumption is false, then it is impossible to determine whether observations are the result of natural or supernational events, and scientific "truth" is meaningless.

3. The universe evolved through natural means. (Corollary 2)
   a. If only natural means are available, then there is no other explanation for the existence of the universe than that it evolved.
   b. The current explanation of the manner in which the universe evolved may be somewhat or completely wrong because "more evidence is yet to be taken."

4. Natural explanations do not have to make sense to human reason.
   a. As with God's revelation in the Bible, God's revelation in the physical world does not need to make sense to human reason.
   b. Scientific explanations merely have to be consistent with all physical observations, not with human logic or emotions.

F. Limitations of science – Summary

1. If a divine being exists, all scientific models are unreliable.

2. Scientific models can only be accepted provisionally and cannot be generally validated.

3. A rational explanation, even if viable, does not mean a valid explanation.

4. An irrational explanation, even if repugnant, does not mean an invalid explanation.

5. Measurements are useless if they change what is being measured.

Scientific models are always hostage to the next observation.

395 – Seek Where You May to Find a Way

Seek where you may to find a way
That leads to your salvation.
My heart is stilled; on Christ I build—
He is the one foundation.
His Word is sure; his works endure.
He will o'erthrow my ev'ry foe;
Through him I more than conquer.

My heart's delight, my crown most bright,
Jesus, you are forever.
Not wealth or pride or aught beside
Our bond of love shall sever.
You are my Lord; your precious Word
Shall be my guide whate'er betide.
Oh, teach me, Lord, to trust you!

Science and Christianity

IV. Sorting Truth from "Truth" from Fiction

@. Review

1. Philosophical reason is always suspect and seldom conclusive.

2. Deductive reasoning is always reliable where it can be applied.

3. Theology is absolutely certain only if you believe the correct one.

4. Scientific models are always hostage to the next observation.

A. What is the origin of the universe?

1. Based on the Bible
   a. The Bible tells us that the LORD created the universe out of nothing (*ex nihilo*) through His word. There was no "before" the beginning because everything started with the creation. Neither did the space which the universe occupies exist before the beginning. Time, space, energy, and matter were all created by God.
   b. "In the beginning, God created the heavens and the earth. The earth was undeveloped and empty. Darkness covered the surface of the deep, and the Spirit of God was hovering over the surface of the waters." Genesis 1:1-2
   c. God said, "For in six days the LORD made the heavens and the earth, the sea, and everything that is in them, but he rested on the seventh day." Exodus 20:11
   d. Moses said, "Before the mountains were born, before you gave birth to the earth and the world, from eternity to eternity you are God." Psalm 90:2

2. Based on science
   a. The fundamental assumption of science leaves no room for supernatural beings or forces to play any role in the origin or operation of the universe. Therefore, the universe had to have evolved because there was no other agency through which it could have come into being.
   b. Science is governed by evidence in the same way that Christianity is governed by the Bible. Scientists draw their conclusions based on the available evidence and change them if new evidence is found.
   c. The current model that best fits the evidence is that the universe exploded into existence apparently from a point mass, with space, time, energy, and matter rapidly spreading out in all directions. Ever since then the universe has been cooling. This is called the "Big Bang" theory.

3. Based on theistic evolution
    a. Proponents of theistic evolution agree with the available scientific evidence that the universe started with a "big bang."
    b. They argue that Genesis 1:1-2 is figurative language for this explosion which God directed for his purposes.

4. Based on creation science
    a. Proponents of creation science believe that Genesis 1:1-2 is a literal explanation of God's creation of the universe.
    b. Some place this creative event farther in the past than is generally held by classic creationists.

5. Based on intelligent design
    a. Proponents of intelligent design do not insist on a literal or a figurative understanding of Genesis 1:1-2.
    b. Their emphasis is that God was guiding whatever happened for his purpose.

B. Age of the universe

1. Based on the Bible
    a. The Bible does not give an exact age of the universe. There is a generally accepted age by biblical scholars of 6,000 to 8,000 years ago.
    b. The estimate of the age is based on the genealogies which appear in places such as Genesis 5, Genesis 11:10–26, Matthew 1:1–17, and Luke 3:23–38, and in numerous other verses. These genealogies are often incomplete, with names omitted. The ages of people involved when they became parents are the basis of the estimate.

2. Based on science
    a. Scientists base their estimate of the Earth's age on several factors, but most heavily on the radioactive decay of atomic nuclei. The rate at which each type of nucleus decays can be determined extremely accurately. Decay half-lives serve as the ruler for measuring time in the past.
    b. The best current estimate of the age of the earth is 4.6 billion years and of the universe, 14+ billion years. These ages, however, must be regarded as "apparent." They are consistent with best measuring practices, but there is no way to be sure that God did not simply create the universe with the appearance of age.
    c. A younger age is ruled out because radioisotopes consistent with such an age are not found on Earth, but all the rest of the stable and radioactive isotopes are.

3. Based on theistic evolution
    a. Proponents of theistic evolution accept the scientific arguments without qualification.
    b. They believe that an old age of the universe is necessary to account for God's developing life through natural processes.

4. Based on creation science
    a. Proponents of creation science generally agree with the 6,000-to-8,000-year estimate.
    b. Their arguments involve what happened after creation, not when it occurred.

5. Based on intelligent design
    a. Proponents of intelligent design have no firm position on the age of the universe.
    b. They merely believe that God acted as the guiding hand as things evolved.

C. Explanation of geological "evolution"

1. Based on the Bible
    a. The Bible does not reveal much about the changes that God has made in the universe since His creation or whether He accomplished them through natural or supernatural means. We know that God has been active, but we cannot say anything about what God has not revealed. Any explanations are complete speculation.

    b. "The eyes of all look eagerly to you, and you give them their food at the proper time. He opens his hand, and he satisfies the desire of every living thing. The LORD is righteous in all his ways and merciful toward all that he has made. The LORD is near to all who call on him, to all who call on him in truth. He grants the desire of those who fear him. He hears their cry and saves them." Psalm 145:15–19
    c. God said, "The soil is cursed on account of you. You will eat from it with painful labor all the days of your life. Thorns and thistles will spring up from the ground for you." Genesis 3:17–18
    d. A psalmist wrote, "He turned fruitful land into a salt waste, because of the wickedness of those who lived in it. He turned the wilderness into pools of water and the desert into flowing springs." Psalm 107:34–35

2. Based on science
    a. The surface of the earth is composed of numerous large and small tectonic plates which are continually moving relative to each other. They ride over one another to form mountains and carry surface materials deep into the Earth when they are subducted. They split from each other and form valleys and trenches.
    b. There is a rock cycle through which mountains are broken into boulders by the weathering process. Boulders are further broken down through cobble, sand, and fine dust, which ends up on the sea floor, where it is eventually compressed and rises through plate action to finally again become mountains.
    c. Hotspots under the earth's crust send up plumes of molten material which break through the earth's surface and create volcanos. These can also build mountains and islands.

3. Based on theistic evolution
    a. Proponents of theistic evolution accept the scientific explanation of the underlying geological processes.

b. They argue that God has guided these processes for His purpose working over geological time.

4. Based on creation science
   a. Proponents of creation science believe that the changes since God's creation of the universe have happened primarily through natural processes except when He has revealed the use of His almighty power.
   b. They create their own models for geological change using natural laws and the unbiblical principle of the "conservation of miracles." They search for evidence to support these models and to disprove commonly accepted scientific models.

5. Based on intelligent design
   a. Proponents of intelligent design believe that the earth was created long ago and has undergone changes by the geological processes that scientists propose.
   b. They differ from scientists by claiming that these changes were the result of a pre-established design which God is gradually implementing as the creation ages.

D. Origin of life

1. Based on the Bible
   a. In Genesis 1 the LORD God reveals that He created all living beings by merely uttering the words calling them into existence.
   b. The LORD furthermore claims ownership of all creatures that exist. He said, "Every animal in the forest is mine, the cattle on a thousand mountains. I know every bird in the mountains, and everything that moves in the field is with me." Psalm 50:10–11
   c. God especially claims ownership of man and places man under His protection. He said, "I will hold each animal and each person responsible for your lifeblood. I will hold each man responsible for the life of his brother. Whoever sheds man's blood, by man his blood shall be shed, for God made man in his own image." Genesis 9:5–6

2. Based on science
   a. Based on their assumption that no supernatural beings exist, scientists work on the premise that all living entities arose spontaneously from non-living materials.
   b. While the process was slow and complicated, they see no other means to create life.

3. Based on theistic evolution
   a. Proponents of theistic evolution claim that God created life through scientific processes.
   b. God may have used supernatural power to refine or hasten the processes.

4. Based on creation science
   a. Proponents of creation science believe that all living entities were created during the first six days as described in Genesis 1.
   b. Some argue that God made them so that they could easily be genetically altered for His subsequent purposes.

5. Based on intelligent design

    a. Proponents of intelligent design argue that God manipulated nature to bring life forth from inanimate material.
    b. They regard the whole "structure of life" that underlies all living things as part of the intelligent design.

E. The "Evolution" of life

1. Based on the Bible
    a. Apart from any fossil evidence we find, we know the nature of some animals has changed because all animals once ate plants (Genesis 1:30) and now some eat other animals. The relatively small number of "kinds" (Genesis 1:24) have become numerous species. We find fossils of species that do not currently exist.
    b. We do not know how many of the changes that the LORD made in living things were through natural processes and how many changes He made though the direct application of his supernatural power. He has not told us. We cannot peek behind the curtain to see how God works.
    c. "Indeed, who among men knows a man's thoughts except the man's spirit within him? So also, no one else knows God's thoughts except God's Spirit." 1 Corinthians 2:11
    d. "Who has directed the Spirit of the LORD? Who can teach him anything or serve as his advisor? Who was his advisor to give him insight? Who taught him the path of justice? Who taught him knowledge? Who showed him the way to complete understanding?" Isaiah 40:13–14
    e. "For the LORD of Armies has made plans, and who can stop him? His hand is stretched out, and who can turn it back?" Isaiah 14:27

2. Based on science
    a. Life evolved from simple cells to form the enormous number of species that we see today through random genetic mutations and natural selection.
    b. While the mechanism is far from completely understood, tremendous progress in understanding portions of it has been made and new information becomes available daily.

3. Based on theistic evolution
    a. Proponents of theistic evolution accept the findings of science as a true explanation of how God developed life on earth.
    b. They view Genesis 1 and 2 merely as simplistic explanations for early people to assure them that God was overseeing what was happening in the world.

4. Based on creation science
    a. Proponents of creation science believe unless God has specifically told us otherwise, changes in living species were accomplished through the laws of nature.
    b. This is in line with their belief in the principle that God practiced a "conservation of miracles" in the changes that He has made to the universe since creation.

5. Based on intelligent design

    a. Proponents of intelligent design believe that God manipulated the living creatures through natural and supernatural means to bring about the current species.
    b. They believe these changes occurred over a long period of time according to a preestablished design which God is gradually implementing as the creation ages.

F. Summary

1. We believe God created the universe in 6 days because the Bible says so.
2. Macroscopic evolution is a corollary of the fundamental assumption of science.
3. Scientific models are always provisional and can never be completely validated.
4. Trying to disprove scientific models is what scientists do all the time.
5. It is folly to challenge scientific models if one does not thoroughly understand science.
6. The purpose of the church is to proclaim the Gospel, not to refute scientific models.

In the beginning God….

293 – God's Word Is Our Great Heritage

God's Word is our great heritage
And shall be ours forever;
To spread its light from age to age
Shall be our chief endeavor.
Through life it guides our way;
In death it is our stay.
Lord, grant, while worlds endure,
We keep its teachings pure
Throughout all generations.