

Creation vs. Science – The Underlying Principles

Under the Theme – The Word Goes On

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Some years ago the manager of a British factory needed an unusual chemical for a manufacturing process that he had been asked by his company to implement. He specified the composition of the chemical and contracted with a specialty chemical firm to manufacture it. When the chemical arrived, he sent a sample of it to an independent testing laboratory to determine whether it met his specifications. The analysis report showed that the water content was too high. He called the manufacturer of the chemical to say that he would not pay for the inaccurate formulation. Assured by his own laboratory staff that the formulation was correct and desiring to get paid for his product, the manager of the specialty firm also sent a sample of it to an outside testing laboratory. It reported that the chemical did indeed meet the specifications. After several sharp exchanges between the two managers over the correctness of the formulation, they agreed to meet face-to-face, each bringing his independent assayer along to defend his results. Imagine the surprise on the faces of the two managers when they discovered that they had sent their samples to the same reference laboratory! Unfortunately, one had asked that the analysis for water be done by weight and the other by volume. This is an example of what happens when two people try to resolve an issue without having a common understanding of a standard of truth.

In fact, the greatest difficulty in the debate over the origin of the universe and of life is that most of the participants in the conversation do not understand the meaning of what the rest of the participants in the conversation are saying. Driven by zeal to establish their own ideas and to refute their opponents, people sometimes even forget the limitations of their own positions. To understand what can be said, and the meaning of what is being said, it is necessary to examine the underlying principles of both Christianity and science. From these, one can develop an approach to judge the validity of the points the debaters are trying to make.

It is best to start our study by looking at the Christian side of the controversy, because we understand it best. In the process we want to stake out our position precisely. The Bible is the historical standard of truth in the Christian church [Chemnitz]. In the WELS we believe that the Bible is the inerrant, verbally inspired Word of God. We believe this because the words of the Bible convict us of our sin and show us our Savior. They reveal to us the will of God and testify to their own truthfulness. We are all familiar with the Bible quotations which establish this. Some of the more important ones are given in Appendix A.

Having stated a standard by which all our teachings are to be judged, it is incumbent on us to abide by that standard. We are all tempted both to add to and to subtract from the Scriptures. Subtraction occurs when called workers ignore in their teaching and preaching those parts of the Scripture with which they feel uncomfortable. Over time, laypeople's impression of the nature of Biblical doctrines changes, and the actual teachings of the Bible seem foreign to them. Additions to Scripture are usually less intentional, and they often result from efforts at apologetics that overstate Biblical doctrine (e.g., the Flacian controversy [Vogel]). A desire to defend Biblical teachings can cause otherwise orthodox Christians to draw unwarranted conclusions or to add human filler to deal with what appear to be unintended omissions in the written word that the Holy Spirit has given to us. We need to keep in mind during this study that we dare say no more and no less than the Scriptures.

The Lord God Almighty {יְשׁוּבָה}

To understand the Biblical teachings concerning how the Lord God has brought the universe to its present state, we must begin by looking at the almighty nature of God. We must do so in a way that allows us to compare the actions of the Lord with models of science, so as not to underestimate God or overestimate science. Let us construct a picture of the Lord's almighty power that is both accurate and detailed by using a series of statements. 1) The Lord is capable of doing anything that is consistent with His will. 2) The Lord has absolute power over everything that exists, regardless of its size, both the things that are visible and those that are invisible. 3) Nothing else that exists, be it physical or spiritual, has any intrinsic power of its own. Therefore, there are no natural laws apart from those that have been specifically established by God. 4) All things from the smallest subatomic particle to the largest galaxy in the physical universe, that is, all entities that can be studied by scientists, act at all times solely with the power delegated to them by God and in accordance with His overall plan for the salvation of the elect. 5) The Lord knows of and authorizes the movement of every subatomic particle so as to accomplish His will, even when that movement is necessary to permit the evil schemes of demons or humans to occur. 6) The Lord's knowledge and control of the universe involves everything that has occurred, is occurring, could occur or will occur during the whole time throughout which the universe exists, so that there is no possibility that anything will happen which will interfere with His saving His elect.

[Note well that none of these statements implies the Calvinistic concept that the Lord has predestined all activity in the universe. Concerning this Augustine wrote "Just as you by your memory do not compel those things to have been done which happened in the past, so God by his foreknowledge does not compel those things to be done which are future." Augustine, *De diversis quaestionibus*].

The first defining statement is that **The Lord is capable of doing anything that is consistent with His will.** A popular restatement might be that "almighty" means God can do anything that He wants do. Certainly Psalm 135:6 supports this way of looking at God's power. "*The LORD does whatever pleases him* (כִּלְאֵי שָׁמַיִם וְאֵרֶץ וְיָם וְכָל אֲדָמָתָם), *in the heavens and on the earth, in the seas and all their depths.*" Because "in the heavens and on the earth, in the seas and all their depths" covers everything in the universe, it might at first seem to be an adequate statement of the Lord's power. Unfortunately, to some it might carry the impression that God is merely overpowering, that is, able to do more than anyone or anything else can do. A rich man who "can buy anything he wants" still cannot buy everything. There is a finite limit to his wealth, even if to people of ordinary means, his purchasing power is seen as being unimaginably great. There are no limits on God's power, although certain Bible verses might be misunderstood to postulate that other beings with independent god-like powers might exist ("*Now I know that the LORD is greater than all other gods, for he did this to those who had treated Israel arrogantly.*" {Exodus 18:9} and "*For the LORD your God is God of gods and Lord of lords, the great God, mighty and awesome, who shows no partiality and accepts no bribes.*" {Deuteronomy 10:17}), so we must also look at His power from another perspective.

The second defining statement is that **The Lord has absolute power over everything that exists, regardless of its size, both the things that are visible and those that are invisible.** The proof for this statement comes from the Biblical testimony that God created the universe. His power over the universe is therefore total. All other beings are His creatures, as is stressed repeatedly by Athanasius in his writings against the Arians. The creation is mentioned over and over again in the Scriptures. Let us look at a few verses. "*In the beginning God created the heavens and the earth.*" {Genesis 1:1} "*For in six days the LORD made the heavens and the earth, the sea, and all that is in them.*" {Exodus 20:11} "*For in six days the LORD made the heavens and the earth, and on the seventh day he abstained from work and rested.*" {Exodus 31:15} "*Lift your eyes and look to the heavens: Who created all these? He who brings out the starry host one by one, and calls them each by name. Because of his great power and mighty*

strength, not one of them is missing.” {Isaiah 40:26} “*This is what God the LORD says—he who created the heavens and stretched them out, who spread out the earth and all that comes out of it, who gives breath to its people, and life to those who walk on it.*” {Isaiah 42:5} “*To make plain to everyone the administration of this mystery, which for ages past was kept hidden in God, who created all things.*” {Ephesians 3:9} “*For by him all things were created: things in heaven and on earth, visible and invisible, whether thrones or powers or rulers or authorities; all things were created by him and for him.*” {Colossians 1:16} “*You are worthy, our Lord and God, to receive glory and honor and power, for you created all things, and by your will they were created and have their being.*” {Revelation 4:11} “*And he swore by him who lives for ever and ever, who created the heavens and all that is in them, the earth and all that is in it, and the sea and all that is in it.*” {Revelation 10:6} Collectively these verses make it clear beyond any doubt that the Scriptures teach that the Lord God made everything, even those things which we cannot see. They show that the power of God is not only greater than anything in creation, it is greater than all the parts of the creation combined.

Moreover, God did not abandon His creation once it had been established, as a watchmaker might after making a watch and winding it. Scripture clearly shows He continues to have power over it. “*He is before all things, and in him all things hold together.*” {Colossians 1:17} “*The Son is the radiance of God's glory and the exact representation of his being, sustaining all things by his powerful word.*” {Hebrews 1:3}

The third defining statement is that **Nothing else that exists, be it physical or spiritual, has any intrinsic power of its own. Therefore, there are no natural laws apart from those that have been specifically established by God.** Perhaps no part of Scripture shows the continual dependence of the creation on the Lord better than Psalm 104, of which the following are selected verses. “*Praise the LORD, O my soul. O LORD my God, you are very great; you are clothed with splendor and majesty. He wraps himself in light as with a garment; he stretches out the heavens like a tent and lays the beams of his upper chambers on their waters. He makes the clouds his chariot and rides on the wings of the wind. He makes winds his messengers, flames of fire his servants. He set the earth on its foundations; it can never be moved. You covered it with the deep as with a garment; the waters stood above the mountains. But at your rebuke the waters fled, at the sound of your thunder they took to flight; they flowed over the mountains, they went down into the valleys, to the place you assigned for them. You set a boundary they cannot cross; never again will they cover the earth. He makes springs pour water into the ravines; it flows between the mountains....You bring darkness, it becomes night, and all the beasts of the forest prowl. The lions roar for their prey and seek their food from God. The sun rises, and they steal away; they return and lie down in their dens. Then man goes out to his work, to his labor until evening. How many are your works, O LORD! In wisdom you made them all; the earth is full of your creatures. There is the sea, vast and spacious, teeming with creatures beyond number--living things both large and small. There the ships go to and fro, and the leviathan, which you formed to frolic there. These all look to you to give them their food at the proper time. When you give it to them, they gather it up; when you open your hand, they are satisfied with good things. When you hide your face, they are terrified; when you take away their breath, they die and return to the dust. When you send your Spirit, they are created, and you renew the face of the earth. May the glory of the LORD endure forever; may the LORD rejoice in his works--he who looks at the earth, and it trembles, who touches the mountains, and they smoke.*” {Psalm 104:1-10,20-32} Those things which we would judge as controlled by the laws of nature are in this psalm declared to be the active work of God.

Indeed, both man and animals require the influx of God's power to exist. (“*The eyes of all look to you, and you give them their food at the proper time. You open your hand and satisfy the desires of every living thing.*” {Psalm 145:15-16}) Psalm 127:1 also points out that only if the Lord's effort is involved in a project, can man's physical efforts succeed. (“*Unless the LORD builds the house, its builders labor in*

vain. Unless the LORD watches over the city, the watchmen stand guard in vain.”) James says the same thing. (“Now listen, you who say, ‘Today or tomorrow we will go to this or that city, spend a year there, carry on business and make money.’ Why, you do not even know what will happen tomorrow. What is your life? You are a mist that appears for a little while and then vanishes. Instead, you ought to say, ‘If it is the Lord’s will, we will live and do this or that.’” {James 4:13-15}) In like manner, Jesus tells us that in spiritual things we are helpless without Him. (“I am the vine; you are the branches. If a man remains in me and I in him, he will bear much fruit; apart from me you can do nothing.” {John 15:5})

The fourth defining statement is that **All things from the smallest subatomic particle to the largest galaxy in the physical universe, that is, all entities that can be studied by scientists, act at all times solely with the power delegated to them by God and in accordance with His overall plan for the salvation of the elect.** We certainly see in the Lord’s creating power His ability to control the largest objects in the universe. He challenges Job whether he can do the same. (“Can you bind the beautiful Pleiades? Can you loose the cords of Orion? Can you bring forth the constellations in their seasons or lead out the Bear with its cubs? Do you know the laws of the heavens? Can you set up God’s dominion over the earth?” {Job 38:31-33}) Psalm 147:4-5 also tells of His control over the macroscopic. (“He determines the number of the stars and calls them each by name. Great is our Lord and mighty in power; his understanding has no limit.”)

Jesus, however, pointed us to the other end of the size spectrum. (“Are not two sparrows sold for a penny? Yet not one of them will fall to the ground apart from the will of your Father. And even the very hairs of your head are all numbered. So don’t be afraid; you are worth more than many sparrows.” {Matthew 10:30-31}) In these verses we see that God’s power reaches to the very small things, that is, to the details. Jesus was assuring His followers that God is concerned about every detail in their lives, so they need not fear what the opponents of the Gospel might do. We know from experience that if all the details are not right, very big projects can fail. If therefore God is in control of all the details, He certainly has the ability to make things happen the way He wants, no matter how big the overall event. By using such terms as “sparrows” and “hairs”, Jesus was referring to small things of so little value to the people of His era that no one would notice if one of them were missing. Were He to speak personally to us today who are concerned about viruses and other microscopic creatures, He would assure us that God also has control over them. In fact, we cannot identify something so small that it is no longer under God’s control. From subatomic particles to galaxies, the Lord has power over the details. Returning to Psalm 147, his understanding indeed does have no limit (אֵין מִקְפָּר). We can therefore be certain that God can carry out what He purposes and that St. Paul was right when He wrote “And we know that in all things God works for the good of those who love him, who have been called according to his purpose.” {Romans 8:28}.

The fifth defining statement is that **The Lord knows of and authorizes the movement of every subatomic particle so as to accomplish His will, even when that movement is necessary to permit the evil schemes of demons or humans to occur.** The previous thesis demonstrated the Lord’s control over His creation. But we can dispel any doubt about at what level that control exists. The writer to the Hebrews says “Nothing in all creation is hidden (ἀφανής) from God’s sight. Everything is uncovered (γυμνά) and laid bare (τετραηλισμένα) before the eyes of him to whom we must give account.” {Hebrews 4:13} Nothing is so small that it is overlooked in the Lord’s governance of the universe. Moreover, The Lord is not distracted or unavailable to supervise the action. Psalm 121 tells us “My help comes from the LORD, the Maker of heaven and earth. He will not let your foot slip--he who watches over you will not slumber; indeed, he who watches over Israel will neither slumber nor sleep. The LORD watches over you--the LORD is your shade at your right hand; the sun will not harm you by day, nor the moon by night. The LORD will keep you from all harm--he will watch over your life; the LORD will watch over your coming and going both now and forevermore.” {verses 2-8} Jesus notes that He provides for the evil as well as the good. (“He causes his sun to rise on the evil and the good, and sends rain on the

righteous and the unrighteous.” {Mathew 5:45}) Even while giving the necessary power to those who want to do evil, the Lord can turn their actions to His own purpose. Joseph told his brothers, “*You intended to harm me, but God intended it for good to accomplish what is now being done, the saving of many lives.*” {Genesis 50:21} Evil Caiaphas fulfilled God’s purpose in a way he never intended when He declared “*You do not realize that it is better for you that one man die for the people than that the whole nation perish.*” {John 11:50} Telling us about that statement seems like a small detail, but the Lord is a God of detail.

The sixth defining statement is that **The Lord’s knowledge and control of the universe involves everything that has occurred, is occurring, could occur or will occur during the whole time throughout which the universe exists, so that there is no possibility that anything will happen which will interfere with His saving His elect.** This final statement locks the rest of the statements in place for the whole existence of time. If the Lord were a creature of time, He might have a plan, the power and the knowledge at the present time, but He might be challenged by events in the future. But the Lord is not a creature of time. For Him there is no future because He fills all time as He fills all space. This is inherent in His very name as He gave it to Moses – “*I AM WHO I AM*” (אֲנִי אֶהְיֶה אֲשֶׁר אֶהְיֶה) {Exodus 3:14} He cannot change (“*I the LORD do not change*” (לֹא שִׁנְיִיתִי).” {Malachi 3:6}) He cannot change because He has no time component. All time is for Him the present. The whole timeline of the universe is but a time point to the Lord. Just as a point in mathematics has no length, no height, no depth, so for God all time is rolled up into one eternal “now.” [Augustine, City of God; Formula of Concord; Becker, Heaven and Hell]

The Lord puts it best Himself in Numbers 23:19 when He by willful intent puts into the mouth of Balaam the saying, “*God is not a man, that he should lie, nor a son of man, that he should change his mind. Does he speak and then not act? Does he promise and not fulfill?*” For the Lord the speaking and the acting are always simultaneous events to Him, even though they may be separated for mankind by many centuries. As Peter says, “*But do not forget this one thing, dear friends: With the Lord a day is like a thousand years, and a thousand years are like a day.*” {2 Peter 3:8} The evidence of the Scriptures forces us to draw the conclusion that the Lord has an active knowledge of the mass, position and velocity of every entity in the universe, regardless of size, for the whole existence of the universe and the ability to control every entity throughout this entire time period in a way that will make His intentions come to pass.

The above detailing of the almighty power of the Lord is necessary to prevent misunderstanding and to serve as a foundation for what follows. When the members of the church have a deep understanding of the overwhelming power of God, they will not be duped by the silly tricks of the philosophers nor will they underestimate the significance of sinning against so great a Being.

The two almighty hands of the Lord

Next we must look at how the LORD acts within the universe by what we might call the “two almighty hands of God.” [God is, of course, a spirit, and therefore does not really have hands. The term is used here merely to differentiate the two ways which He acts within His universe. “*Remember that you were slaves in Egypt and that the LORD your God brought you out of there with a mighty hand and an outstretched arm.*” {Deuteronomy 5:15}] The easier hand to understand is the “non-natural hand.” We commonly call the actions of this hand “miracles” and say they are accomplished “by His word.” We see this hand in action in the very first verse of the Bible. Genesis 1:1-2 reads “*In the beginning God created the heavens and the earth. And the earth was formless and empty, and darkness was over the surface of the deep.*” For “created” the Bible uses בָּרָא, which in conjunction with בְּרֵאשִׁית (in the beginning) means *ex nihilo* (out of nothing). The rest of Genesis chapters 1 and 2 further demonstrates the ability of the Lord to control the universe merely through His word (וַיֹּאמֶר אֱלֹהִים). When He speaks, everything obeys.

The non-natural hand of God is also seen after creation. When mankind fell into sin, God “*cursed the ground* (אָרְרָה הָאָדָמָה)” {Genesis 3:17} on account of man. We do not know all the things that happened, but we do know that the situation was no longer as pleasant for those who dwelt on the earth {Genesis 3:14-19}. In His sending the great flood upon mankind, we see how the Lord used special resources to permanently change the world {Genesis 7:11-9:17}. We have no idea how extensive these changes were, but from the long period of time required for the drainage of the water and from the first appearance of a rainbow, it is possible that they were very extensive (although we should not try to specify what God did not tell us). Again at the time of the confusion of the languages at the tower at Babel, we see God intervening in the affairs of man in a non-natural way to accomplish His intent {Genesis 11:1-9}.

This non-natural intervening of God continued throughout the Old Testament. There were the plagues on Egypt {Exodus 7:19-12:32} and the parting of the Sea of Reeds {Exodus 14:21-28}. There was the remarkable situation at Mount Sinai {Exodus 19-34}. There was the crossing of the Jordan on dry land when it was at flood stage {Joshua 3}. There were the axe head that floated {2 King 6:5-7}, the entire army struck with blindness {2 Kings 6:18} and the slaughter of the Assyrian army before Jerusalem {2 Kings 19:35}. Other events also seem to have been miracles, accomplished by direct commands of the Lord, overriding the laws of nature. The Lord used miracles at the critical times for His people.

In the New Testament the miracles started with the announcement of the birth of John the Baptist {Luke 1:5-25, 1:57-66} and continued through the ministry of Jesus’ apostles {Acts 28:9}. Some of these were done directly by one of the persons of the Trinity, most often by Jesus, while others were done through the apostles. The miracles included the virgin birth {Luke 1:26-38}, curing diseases and handicaps (dozens of examples in the four gospels), calming the lake {Matthew 8:23-27; 14:25-32}, feeding large crowds {Matthew 14:19-21; 15:35-38} and raising the dead {Luke 7:11-15; Mark 5:35-43; John 11:1-44}. The number of miracles is so large that it was clear even to Jesus’ opponents that He was not a normal man, limited by the processes of nature {John 3:1-2; 11:47-48}.

The Bible furthermore indicates in both testaments that God expects to act outside of nature on behalf of His people who pray to Him for deliverance (Joshua asked that the sun stand still {Joshua 10:12-13}, Hezekiah sought rescue from the Assyrians {2 Kings 19:14-19}, Elisha asked for the Syrian army to be struck with blindness {2 Kings 6:18}, Christians asked for the deliverance of Peter {Acts 12:7-17}). Collectively, we can describe these actions as being done by the non-natural hand of God. Because science excludes the existence of supernatural beings from its models, science cannot model things done by the non-natural hand of God.

The natural hand of God is the hand that works invisibly within the laws of nature, where that term is used in the way scientists would employ it. In other words, the Lord is using this hand when He carries out His purpose in such a manner that we cannot detect by scientific means how He is acting. Let us look at how He can do this and at the Biblical evidence supporting it.

If one rolls a perfect cubic die an infinite number of times, each side will appear on top the same number of times, because each side has an equal probability of being in that position. If one rolls it only a few times, however, one cannot be sure that each side will come to the top with equal frequency. Moreover, there is no way to scientifically determine which side will appear on top on the next roll of the die, even if one knows the results of all the previous rolls. Because of this, if the Lord makes the die to have the side with 4 dots become the top side on a particular roll, there is no way that scientists can determine that this was not just a random event rather than the work of God. This means that when God acts within the laws of probability which are applicable to a particular model of a natural phenomenon, it is impossible for scientists to detect that it was God and not random chance that produced the result.

Most phenomena in the natural universe are so complex that they cannot be represented by a deterministic model, but rather must include a probability of possible outcomes. When only a few drops of rain fall on an uncovered parking lot, which drop-sized areas of the parking lot will be wet and which will be dry? When a bat hits a ball, will the position and direction of the bat on the spinning ball produce a home run or a foul ball down the right-field line? Whether we are looking at erosion, volcanic eruption or nuclear decay, there is always a range of outcomes that are consistent with good scientific modeling, and any observer will not regard them as anything other than natural occurrences. The omniscient and omnipotent God therefore can cause events to be driven in a particular direction without letting anyone realize that the observed events are a result of His divine intent and management of nature. In using His natural hand, the Lord is effectively “flying under the radar” of human observation and scientific modeling. We cannot directly see what He is doing as we can in the cases in which He uses His non-natural hand.

The Scriptures often point out how God acts within the laws of nature to carry out His plan. When He does so, there is no sudden, unmistakable sign from the Lord, but God’s plan is advanced seemingly by random events of nature. Let us look at some examples. The Lord told Adam and Eve that the ground would not always be easy to till. (“*It will produce thorns and thistles for you.*” {Genesis 3:18}) The Lord warned the Israelites that He will use the forces of nature against them if they are unfaithful. (“*You will sow much seed in the field but you will harvest little, because locusts will devour it. You will plant vineyards and cultivate them but you will not drink the wine or gather the grapes, because worms will eat them. You will have olive trees throughout your country but you will not use the oil, because the olives will drop off.*” {Deuteronomy 28:38-40}) Jesus stated that the Father even handles the mundane things we simply expect from Him. (“*He causes his sun to rise on the evil and the good, and sends rain on the righteous and the unrighteous.*” {Matthew 5:45}) The Lord also said He would control people’s actions through psychological control. (“*Listen! I am going to put a spirit in him so that when he hears a certain report, he will return to his own country, and there I will have him cut down with the sword.*” {Isaiah 37:7}) Jesus told His disciples that before the coming of the end of the world, there would be great signs in nature. These would remind the faithful, but the rest would not see the hand of the Lord in them. (“*There will be great earthquakes, famines and pestilences in various places, and fearful events and great signs from heaven.*” {Luke 21:11}) Anyone who observed the actions of God in these verses or many others in the Scriptures would not have been impressed, but he would have said “that’s the way nature is.” Because the actions of God’s natural hand cannot be detected by man, they are easy for the unbeliever to ascribe to “Mother Nature.”

Standards in Mathematics and Science

We tend to ridicule Pilate for asking Jesus “What is truth?” Yet when one field of study tries to deal with something that arises in another field of study, this question is very relevant. One needs to know the standard of truth being employed to know what credence one can give to statements made. Let us look at an example.

In matters of the law there are two standards of truth used to decide cases in court. In civil cases the standard is “preponderance of evidence,” but in criminal cases the standard is “guilty beyond a reasonable doubt.” The first is much easier to prove to a jury than the second. This is why civil lawsuits can often succeed where criminal charges would fail. The standard of truth that is being employed is therefore important in determining the significance of any matter under consideration. Each legal standard, however, can produce a false result, because evidence may be missing that would reverse the verdict.

To understand the standard of truth that is being employed in science, we must first separate it from mathematics. Mathematics is the study of sets of domains devised and defined by human minds in such fields as geometry, calculus, topology or symbolic logic. In every field of mathematics an investigator can create his own domain by definition, and the validity of any thesis within that domain can be established as true, false or indeterminate, based solely on how the domain is defined. In effect, the person defining a domain is the “god” who rules over it. The standard of truth used to establish the validity of a thesis in mathematics is that every possible case to which a thesis applies must be tested and found to meet the statement of that thesis. Mathematics has powerful tools to allow cases to be examined systematically so as to accomplish this seemingly onerous task. (See examples in Appendix B.) In mathematics absolute truth therefore can be determined.

The basic sciences (as opposed to the applied sciences like medicine, engineering or business) are the study of the universe, that is, of God’s creation. Because scientists can only observe the events of nature that occur but cannot alter the underlying natural forces or the properties of matter and energy that cause them, they are not the masters of events. It is true that in some fields experiments can be performed in which as many variables as possible are controlled, but even in these cases, what is observed is the result of forces involving matter and energy that are beyond the control of the scientists. Scientists attempt to explain their observations of nature in terms of the most elementary principles possible. Their efforts are called “modeling.” We therefore say that the goal of science is to build models that explain observed phenomena in terms of natural laws. [Note well: The words “law,” “model” and “theory” are often used interchangeably in science.]

Often scientists will use mathematics to support their work by attempting to match a mathematical domain of known properties to the domain which they are studying in the real world. If they can find a good match, the properties of the mathematical domain, which are known with certainty, can be used to predict what is happening in the scientific domain of study, where things can only be observed within the reliability of the measuring devices available [Shortley and Williams]. (People, even scientists, sometimes confuse the validity of the mathematical model with the validity of the scientific model it is being used to approximate, thereby imagining the scientific model is equally as good as the mathematical.) Because scientific theories usually cover an incredibly large number of cases and because scientists do not have the ability to study cases by abstraction as do mathematicians, scientists cannot use the same standard of truth as mathematicians. Scientists instead employ what is called the “scientific method” to approximate truth, because, as we will see, scientific truth cannot be completely established. Scientists observe a phenomenon, develop a model to explain it, evaluate their model by further observations and continuously refine it until it proves satisfactory or until it is supplanted by a better model.

The limitations of the scientific method

The goal of the basic sciences, therefore, is to develop models that explain what has been observed in the universe and to predict what is yet to be observed. Each model has associated with it a set of conditions under which it is applicable (sometimes called assumptions) and a set of variables that can be substituted for by the corresponding values for the data points of interest. A model is composed of equations, logical expressions, boundary conditions, default values and sometimes a certain amount of supposition (at least in models which are not yet well developed). If a model is correct, then when the variables are substituted for a data point, the result produced by the model will be the same as the observed result in nature for those variable values.

Let us consider an example of the scientific method in action. One speculates that the length of the shadow of an object made by the sun is related to its height. After a few measurements, one concludes the appropriate relationship is that the ratio of the length of the shadow to the height of the object is constant.

One computes the constant, and one has a model. When one tries the model some time later in the day, one discovers that the “constant” is not constant, but it has changed. The ratio of the length of the shadow to the height of the object is now equal to a different number. One soon concludes this change is a result of the sun changing its position in the sky. One develops a more complex equation of relationship which includes a function relating the height of the object to both the length of the shadow and the time of day. All now seems well. However, when one tests the model at 10 pm, one finds that there is no shadow because it is night. One therefore sets boundary conditions, namely sunrise and sunset, the points between which the model is applicable.

But all is still not well. When one demonstrates one’s model to a friend three months later, once again the model fails because the sun is no longer in the same place in the sky at a particular time of day as it was when the model was developed. One has to take into consideration the changing position of the sun based not only on the time of day but also the time of the year. Having made this complex correction to the equation and the boundary conditions, one finds that the model still does not work the next day because the sky is overcast. One adds the condition that the sun must be shining. One can finally measure the heights of tall objects accurately based on the length of their shadows within the constraints of the model. This is how science works in refining models to explain and predict what is observed. As one can see from this example, the scientist is always a prisoner of new observations and must modify his model accordingly. **The first general limitation of science is that a scientist can never completely validate a model because he cannot be sure that some other factor affecting the system of interest will not be discovered later.** (Appendix C contains other examples of this limitation.)

The primary assumption that scientists must make in all their investigations is that all observed phenomena are due to natural forces and the inherent properties of matter and energy. If observed events are affected by powers operating outside the laws of nature, i.e., supernatural powers, then what has been observed cannot be modeled, and science is helpless. The primary assumption of science therefore excludes gods, angels and demons from the universe it is modeling. [Note well: Scientists cannot disprove the existence of God because that is one of their assumptions!] To show why scientists must make that assumption, consider the following: Suppose a woman is baking ten dozen chocolate chip cookies. Also suppose several hungry teenagers periodically wander into her kitchen and grab some of the cookies as she bakes. The result will be that she does not know how many cookies she will have when she finishes baking. In the same way, if some of the observations which scientists make are the result of God acting by supernatural means, their models will be wholly unreliable at explaining events. **The second general limitation of science is that the existence of any supernatural being(s) renders even the best scientific model only as reliable as that being or those beings want it to be.**

Finally, just because a model is viable, does not mean it is correct. For example, if a woman is observed eating breakfast in Minneapolis and later seen in the evening of the same day in Chicago, one might theorize that she has flown between the cities. That is a viable model, but not necessarily a correct one. She might have instead driven or taken a bus or train between the two cities. **The third general limitation of science is that even if a scientific model completely explains what is observed, it might not be correct because the phenomenon it describes might happen in a completely different way.** For engineering purposes this limitation is meaningless because if the model gives the correct answers, even for the wrong reasons, it can still be used for designing products. There can, however, be great theological significance if the model contradicts God’s word.

The existence of these limitations, however, is no reason to outright reject scientific research. Scientists have been very successful at producing many useful explanations of things that can be observed in nature. This success has produced the underpinnings for the great technical advancements that we see. Comparing today’s world with the world of 200 years ago shows astounding technical progress in almost

every area of life. Yet, as we have seen, there are limitations to the faith that we can place in what is learned through the scientific method (See Appendix D “Can a Christian be a scientist?”).

Attempting to Apply Science to Understanding Creation

In an effort to combat what they feel is an attack by science on the Christian faith, some have tried to use science to fight back. Is this possible? Can the methods of science, for example, be used to substantiate the Biblical account of creation? Unfortunately, this effort runs into both scientific and theological difficulties as we shall soon see.

Difficulty 1: Speaking the same language

It is appealing to want to force scientists to “get their facts straight,” but the very word “fact” has no consistent scientific definition. Scientists rather speak of “observations,” “evidence,” “models,” “assumptions,” “domains,” “precision,” “metrics of measurement,” and a whole plethora of terms that they have developed to more accurately define the entities with which they work. Scientific terminology presented to the public often does not correctly represent scientific thought. Consider how general the terminology in Luther’s Small Catechism is compared to the terminology in a dogmatics textbook. To debate science, one must accurately speak within the scientific frame of reference or one sounds like a ignoramus (*If then I do not grasp the meaning of what someone is saying, I am a foreigner to the speaker, and he is a foreigner to me.* {1 Corinthians 14:11}).

Difficulty 2: Developing a scope for the discussion

According to the basic assumption of science, scientists can only study what occurs by the laws of nature, that is, those things controlled by God’s natural hand. Therefore to apply the scientific method to defend what the Bible says about creation, one must clearly define what God did with His natural hand versus what He did supernaturally. When we go to the Bible to gain this information, however, we find it actually tells us very little about how God created and reshaped the world during the first few thousand years of its existence. We know that He created the world in six days and that the world had some geological age because the ground was fertile enough to support plants, but what else? Did the original world the Lord created have mountains and valleys? Did it have caves and iron deposits? Did it have diamonds, fossil fuels or even fossils? The Bible does not say whether any of these were created by God in the beginning through His word, whether they were formed sometime later instantly at His command or whether they developed through natural processes under His direction. He might even have used His natural and non-natural hands alternately. [Becker, Evolution and Creation]

Even where God says something, He may not give us enough information to build a defensible model. For example, Genesis 1:6-8 tells of an “expanse” (רָקִיעַ) which God established to separate the waters He created. Genesis 2:5-6 speaks of a “mist” (אֶדָּ) arising from the earth. Genesis 7:11 says the “windows of the heavens were opened” (אֶרְבַּת הַשָּׁמַיִם נִפְתְּחוּ). Some have claimed that these verses mean that there was a different hydrological system before the flood and/or that the earth was surrounded by a water mantle. Perhaps, but these verses can also be understood within our current earth model. The expanse may merely have separated the liquid water from the water vapor of the clouds high in the sky, the mist might have been a result of the land mass drying out and “the windows of heaven opening” is an idiom still used today to describe heavy precipitation. We should not add to the Bible more than what it says. [Luther’s comment on mutilating the Scriptures to read as we wish is relevant – see bibliography.]

Because almost anything one says about how God brought the world into its current state is speculation, any conclusions one attempts to draw are also speculative. One cannot get acceptable scientific studies out of such an approach. (See other examples in Appendix E) In fact, creation science is not science because it cannot accept the primary assumption of science. Moreover, it is also poor theology. When one goes beyond what the Bible says to specify how God must have acted in particular situations, either naturally or supernaturally, one is effectively trying to bind God's hands by human reason. Paul writes, "*Let God be true, and every man a liar.*" {Romans 3:4} The Bible is revealed truth, and thus its teachings about God and His works are outside the scope of human theorizing or experimentation. ("*For prophecy never had its origin in the will of man, but men spoke from God as they were carried along by the Holy Spirit.*" 2 Peter 1:21) To claim that human speculation is necessary to defend God's truth is to place oneself in the position of being God's teacher. As the Lord explained to Job, no one is qualified for that position. ("*Will the one who contends with the Almighty correct [יִסּוּר] him?*" Job 40:2)

Difficulty 3: Inherent limitation of models

All scientific models are valid only in the domain for which they were developed. For example, the Second Law of Thermodynamics is one of the most tested models of science. This model says the amount of entropy (randomness) in the universe continues to increase, and all systems therefore run downhill to the state of lowest potential energy. Because macroscopic evolution involves increasing complexity, some have claimed that this law makes it impossible. The conclusion, however, is false because the law is only applicable to the domain of "closed" systems, which are rare in nature. A closed system is one in which no matter or energy can leave or enter the system [Daniels and Alberty]. Let's look at an example.

Water in the ocean is salty and at sea level. Water in the winter snowcap of a mountain is much purer and at a higher elevation. According to the Second Law of Thermodynamics, it would seem to be impossible for sea water to purify itself and move to a higher elevation. Yet water from the sea clearly does move to the mountain top and in the process does become purer; otherwise, the mountain top would soon be permanently devoid of snow. The second law cannot be applied because the earth is not a closed system. Energy from the sun enters the Earth's atmosphere and evaporates water from the sea and, in the process, also purifies it. Solar energy heats some places more than others, thereby causing the air with the moisture from the sea to move upward over the mountain. At higher elevations the moisture condenses and falls on the mountain top as snow. In the same way, solar energy and the energy released by lightening can cause molecules to become more complex, particularly when aided by materials that have the ability to act as catalysts. For the untrained it is easy to apply scientific models inappropriately because they are often stated without a detailed listing of the assumptions that are required to apply them.

Difficulty 4: Outdated versus current science

There is a great difference between an historian and a newspaperman. The historian wants to develop an accurate picture of some event or period in the past. A newspaperman wants to get a story before the public with as many details as can be gathered by press time. The latter knows someone else will clean up the misinformation later. Scientists are more like newspapermen than historians because they expect everything they do to be updated as more information becomes available. When one challenges a scientist, one must do it based on his current methods, not on practices of the past. Scientific practice, unlike Biblical theology, changes continually.

For example, one approach that geologists have historically used to determine the age of landscapes is based on the rate at which sediment builds up. They measured the current rate of sedimentation and extrapolated how long it would have taken for the various layers of sediment they observed to develop. Because there are cases when such approaches have been shown to be grossly inaccurate, geologists long

ago concluded they needed more supporting data. They now gather additional evidence by doing core sampling to determine what fossils and other time markers, such as rocks with radioactive materials, are present in the various layers. If one wants to challenge the geological approach to dating landscape features, one must study the current methods and find their weaknesses, not dwell on the past shortcomings of sedimentation readings.

Perhaps the most ill-used scientific model is Pasteur's Law of Biogenesis, which states that life comes only from life [Weigand]. Pasteur's validation of his model occurred under a very small number of environments and was based on a definition of life that would not be regarded as accurate in view of what has been observed in the last 100 years. It is dated science and cannot be considered an established universal law. Today most people would consider DNA molecules as being alive because they can reproduce themselves. It is possible for molecular scientists to cut DNA molecules into pieces that cannot reproduce (and therefore cannot be regarded as alive), attach other suitable parts to one or more of the pieces and then recombine the parts of the DNA to be a different molecule capable of reproducing itself. Is this not creating something alive from something not alive? Some enzymes have been synthesized from basic chemicals and, when completed, have folded up and functioned the same as the enzyme molecules produced by living organisms. As techniques have improved, larger and larger molecules involved in life processes have been synthesized from basic chemicals. If people base their argument against macroscopic evolution on the concept that life at some level cannot be made artificially, they run the risk of being shown to be fools if DNA molecules or even cells are synthesized from basic chemicals. The Bible does not say that plant or animal life contains some divine component and not just its chemical elements and structures. Even for man, it is the soul that is uniquely given by God and that transcends the properties of nature which makes man a living being. (*The LORD God formed the man from the dust of the ground and breathed into his nostrils the breath of life, and the man became a living being.* {Genesis 2:7}) Without the soul, man would indeed be like the apes whose lives might be no more than the sum of their chemical makeup.

It is hard for even the avid reader to keep up on the changes in scientific methodologies and models in even a small number of fields. Building our house of faith upon the work of science is building on shifting sand, which can leave the builders appearing to be fools when experimental support for their theories suddenly disappears. Scientific models will always be changing, but God's word will never change. We have a message people can trust today, tomorrow and forever. Building our house of faith upon the teachings of the Bible is building it on solid rock. The storms of human reason cannot overthrow it {Matthew 7:24-25}.

Difficulty 5: Ineffective challenges to science

Some try to attack evolutionary models with counterexamples. But counterexamples, while being a deadly effective technique in mathematics, are much less so in science and are often easily overcome by tweaking the model being attacked or by improving the method of measurement. In fact, scientists are continuously challenging each others' models – this tactic is the heart of classical science. If religious critics find anything significant, it actually helps scientists to strengthen their models. Most of the time, however, attacks made on models by those outside a particular scientific field appear to those in the field as foolish as a Jehovah Witness' attempt at interpreting Scripture appears to a genuine Bible scholar.

Probability theory has been misused in an effort to show that some forms of evolution are so improbable that they could not happen [Weigand]. Developing a correct probability model for a multi-step process with multiple pathways is so complex that only someone who has had substantial training in both probability and the field of study in which the process exists can possibly do it correctly. Often it is not possible at all. The discovery of a new pathway or a new catalyst can change the calculated probability

for a process by many factors of ten. Numerous things considered so improbable in the 1930's that people would have laughed at the thought of their development, such as the cell phone and the GPS, are now considered necessities of life.

Difficulty 6: Fighting the wrong battle

In the first and second centuries the church was opposed by Greek philosophy, by paganism and by Gnosticism. Each of these offered a different challenge to the Christian church, but they were united in their reliance on human reason to understand the things of God. Many of the early church fathers (e.g. Irenaeus, Tertullian, Hippolytus, Lactantius) made the mistake of trying to battle these opponents on their own turf. As a result, they developed complex philosophical arguments against their opponents. These apologists for the Christian church wanted to show that the Lord was not just another god like those common in Greek mythology, so they tended to rationalize what they taught about Him. Emphasizing good works to promote Christian virtue and heroic death as a mark of faithfulness caused people to view salvation as being dependent on these things. Soon even the church teachers were proclaiming this error openly. Many people were led astray and lost because church leaders moved away from the power of God to a reliance on their own philosophical explanations.

The teachings of science pose the same challenge for the Christian church today that Greek philosophy did for the early church. In both cases educated and respected people are saying things that contradict Biblical teachings, and it is only natural that we want to challenge them, lest we appear to be unable to answer their claims. We do need to vigorously defend Biblical teachings in the face of these attacks, but we need to do so on a battlefield of our own choosing and not on one of our opponents' choosing. Otherwise, we run the risk of introducing the same kind of distortions introduced into the early church. The real problem is not science but Secular (i.e., radical) Humanism [Skinner], which has pretty much taken over Western society, including many of the so-called mainline Protestant churches. The battlefield must be over the nature of man, who is totally depraved, not the changing models of science. We must use the overwhelming and very personal evidence that man remains self-centered and sinful despite the efforts of Humanists to reform him. Humanism can, at best, only reshape man's vices, not remove them. It is in this arena that the heartaches and despair of sinful individuals eat away at their confidence in their own abilities to deal with their greatest challenges and with their accountability before an eternal God from whom they can never shake themselves free. Here we have the power of the word of the Lord with us.

Difficulty 7: Compromising the church's mission

As the church we cannot allow ourselves to compromise our mission of preaching the Gospel. Moses warned the Israelites against putting a stumbling block in front of the blind ("*Do not curse the deaf or put a stumbling block in front of the blind, but fear your God. I am the LORD.*" {Leviticus 19:14}). Paul warned against the ministry creating stumbling blocks (*We put no stumbling block in anyone's path, so that our ministry will not be discredited.* {2 Corinthians 6:3}). Such stumbling blocks can be placed when one tries to challenge the validity of science instead of pointing out its limitations. This can, for example, put our youth at risk if their religious teachers teach them the false ideas that come from creation science. Science professors learned long ago how to demonstrate the fallacy of these ideas. If students come to believe their pastors and Christian teachers have misled them about science, it is easy for them also to conclude that they misled them about religion and that Christianity is old-fashioned superstition. Many students have lost their faith in Christ because it was tied to the baggage of creation science. Moreover, when a church gets more deeply involved in science than necessary, the educated outside the church will steer clear of Christianity altogether or join a "progressive" church where people are more reasonable.

While we must vigorously proclaim and explain what the Bible teaches, we do not need to rise to everything our opponents throw out. As when the Jewish leaders tried to trap Jesus concerning paying taxes to Caesar {Matthew 22:17-22}, we must be careful not to be drawn into taking foolish positions. We need to keep our focus on the Law and Gospel and deal with the other things in the terms of these teachings.

Conclusion

Let us end with a story from the Eighteenth Century. At the beginning of the Seven Years War, Frederick the Great, king of Prussia, faced a seemingly impossible situation. He became entangled in a war with Russia, Austria and France, as well as some of their client states. The population of the enemy lands exceeded the population of Prussia by more than 10 to 1. Frederick's plan was to try to keep the army under his personal command between the Russian and Austrian armies and prevent them from coordinating an attack against him. He sent his oldest general with all the troops he thought he could spare to defeat the army of Saxony, an ally of France, and thereby block the path of any French army coming from the west. The old general frittered away the summer and the fall maneuvering here and there. By the beginning of December the Saxon army had retreated into the security of Dresden, the Saxon capital, and sat atop earthen works that surrounded the city. Snow and ice coated the defensive position, making a successful assault up the slippery slopes impossible.

Frederick, irritated by his general's inactivity, ordered him to immediately assault and capture the city. Reluctantly, the old general ordered the charge. The Prussian soldiers were the best in the world, but not even their determination and military skill could overcome the treacherous footing of the icy earthen embankments. There were tears in the old general's eyes as he watched his brave soldiers take heavy casualties, falter and then turn in flight down the embankment and across the surrounding field. The Saxon soldiers, elated with their success and eager to finish off their perpetual nemesis, raced down the embankment after the fleeing Prussians. It was then that the old general ordered his cavalry, useless against the city's defenses, to attack the Saxon army. With their sabers drawn, the cavalry charged around the flank of the Saxon army and attacked it from behind. The fleeing Prussian soldiers, on hearing the bugle call, turned and fired point blank into the pursuing Saxons. In less than a half hour the Saxon army ceased to exist, and the Prussian army marched into Dresden unopposed. Saxony was out of the war, and Frederick would manage to stalemate his enemies until, one-by-one, they dropped out of the war.

The lesson from this story should be clear – Never abandon an impregnable position to do battle on a field of the enemy's choosing! Why do we believe in divine creation? It is because we believe in Christ and in the Bible. 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.”* No unbeliever is ever going to be argued into faith by scientifically proving creation. As an apologetic exercise, it's a waste of time. If we want people to believe what God says about creation, they need to have faith, because it is by faith (and by faith alone) that we understand that the universe was created at God's command. For the believer whose faith is under attack, there's a time and place to say, “Just because modern science says it, doesn't make it true. Science has well-defined limitations.” The Scriptures are our impregnable refuge because they are the word of God. Science is a field of shifting human models held by our Humanistic opponents, where we can only waste our time and our credibility.

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Appendix A - Key verses of Scripture that support its inerrancy

- All Scripture is inspired. It is not merely words of inspired men writing what seemed right at the time. *{All Scripture is God-breathed and is useful for teaching, rebuking, correcting and training in righteousness, so that the man of God may be thoroughly equipped for every good work. 2 Timothy 3:16-17}*
- The words were the words God wanted written. They were the right words to accomplish His purpose using the idiosyncrasies of the writers. *{This is what we speak, not in words taught us by human wisdom but in words taught by the Spirit, expressing spiritual truths in spiritual words. 1 Corinthians 2:13}*
- The prophecies of the Old Testament were fulfilled. The writers and speakers in the 1st Century completely trusted the Old Testament as the word of God, and they pointed out how it was fulfilled in the work of Christ and His church. *{So was fulfilled what was spoken through the prophet: Matthew 13:35a}*
- All was written as part of a plan. The Lord knows what He must do to get everything to happen as He wants it to happen. *{For everything that was written in the past was written to teach us, so that through endurance and the encouragement of the Scriptures we might have hope. Romans 15:4}*
- Writings by one Biblical writer are recognized as God's word by other writers, even contemporaries. *{In the first year of his reign, I, Daniel, understood from the Scriptures, according to the word of the LORD given to Jeremiah the prophet, that the desolation of Jerusalem would last seventy years. Daniel 9:2}*
- Even the accent marks and plurals are important. Both Jesus and Paul noted how particular the Holy Spirit had been in creating the Bible. *{I tell you the truth, until heaven and earth disappear, not the smallest letter, not the least stroke of a pen, will by any means disappear from the Law until everything is accomplished. Matthew 5:18 The promises were spoken to Abraham and to his seed. The Scripture does not say "and to seeds," meaning many people, but "and to your seed," meaning one person, who is Christ. Galatians 3:16}*
- If we cannot rely on the words of the Bible, we have no standard. We know nothing about God's plan of salvation and Jesus Christ except through the Bible. *{And if Christ has not been raised, your faith is futile; you are still in your sins. 1 Corinthians 15:17}*

Appendix B – Examples of Mathematical Domains

A mathematical domain can be defined as the set of positive integers. For that domain, the thesis that addition is a valid operation is true. So is the thesis that multiplication is a valid operation. These statements are true because both operations always yield results within the domain. This can be shown to be the case through a technique called “recursion.” The theses that subtraction and division are valid operations are not true, however, because these operations can produce values outside the domain (e.g., $3 - 6 = -3$, or $3/2 = 1.5$, neither result being a positive integer). We show they are false by a technique called “counterexample.”

In the same way an isosceles triangle is a domain concerning which theses can be proven or disproven. Because proofs are general, e.g., they are not based on specified lengths for any of the sides of the triangle, the proofs cover all possible isosceles triangles. It can be proven that the base angles of an isosceles triangle are equal; therefore, anything that fits the definition of the domain we call “isosceles triangle” will have equal base angles.

Because every domain of mathematics is abstract and not inherently tied to anything in God’s creation, theses that are valid in a domain are applicable to any entity that meets the definition of that particular domain.

Appendix C – Examples of the First Limitation of Science

Let us pick as our domain all the people in the world and propose two theses about them. The first thesis is that no one can speak fluent Mongolian. If one asks 1000 people in Mequon, Wisconsin and finds that not one can speak fluent Mongolian, does that prove or disprove the thesis? The answer is neither, even though the thesis is false. There are people in the world who can speak fluent Mongolian, but we have found no evidence that they exist. Clearly we stopped asking people too soon. The second thesis is that no one can fly 10 miles simply by flapping his arms. Suppose again we ask 1000 people in Mequon about this and get a negative answer. Does that prove or disprove the thesis? Again the answer is neither, even though this thesis is true. Because we followed the same procedure as we did for the first thesis, the conclusion must also be the same.

No matter how many people give us negative answers, the validity of both theses remains undetermined. We can only validate the theses if we ask everyone in the domain and receive a “no” answer (exhaustive analysis), but we can invalidate the theses by receiving a single “yes” answer. Because the answer of the next person asked is independent of the answers of all the previous people asked, there is no way to determine what a person’s answer will be by an algorithm. This example is isomorphic to a well-known mathematical problem, called the Halting Problem, which has been proven to have no solution for any domain that is too large for exhaustive analysis of each member of the domain. Since all the fields of science are such domains, no thesis of science can be proved to be true with absolute certainty. Science therefore cannot be the search for truth! The best scientists can do is give a plausible explanation of observed events, always subject to change. The sample size of the population studied is therefore a manifestation of the first limitation.

Basic science is restricted because scientists must assume there are available measuring technologies which are not subject to change during the time that the measurements are being made. Without a reliable yardstick, for example, one cannot measure common lengths. The measurement of time is particularly difficult because most things change over time and change in non-uniform ways. Moreover, scientists must assume their measuring methods do not disturb what they are measuring. This is a problem on the sub-atomic scale, where even the momentum of light can displace a particle (described by the Heisenberg Uncertainty Principle), but it is also a problem on a global scale because human activity has contaminated many environments so that it is impossible to know what they were like before man entered them. The precision and reliability of measurements are also manifestations of the first limitation.

Appendix D - Can a Christian be a scientist?

If the primary assumption of science (i.e., all observations are explainable in terms of natural forces and the properties of matter and energy) excludes the existence of God, can a Christians be a scientist? This is a question that requires serious investigation. The difference in approach between Christianity and science appears to be irresolvable. Let us begin looking at the issues involved by once again splitting mathematics from science.

Fields of mathematics pose no more challenge to the Christian faith than working puzzles like Sudoku or Kakuro. There are no inherent moral issues in writing numbers on a piece of paper or proving theorems. The various fields of mathematics make no assumptions that conflict with Scripture. Christians can therefore be mathematicians.

The basic sciences, on the other hand, have a great similarity to complex computer games in which all the rules may not be known, some of the necessary actions may not be acceptable for Christians to do in a real-world environment and a successful outcome may not even be possible. Some games do not require actions that conflict with the Christian faith in the game environment, while other games require a player to break many of the 10 commandments to bring his game persona to a favorable outcome. Some involve graphic violence. Understanding how a Christian responds to such games can aid in understanding how a Christian should view science.

First, there is the issue of detachment. When one hears a fairy tale about a knight fighting an ogre or a dragon, one tends to cheer for the knight, even though he is doing violence. Yet one does not morally bind oneself to the knight's actions. In the same way when one plays a computer game which requires one to kill an evil troll or steal a villain's treasure, one does not have to commit oneself to killing and thieving in the real world. While one accepts the rules of the game as "working assumptions" for playing the game, one does not have to morally bind oneself to those actions, even if they are necessary in the game. If one did, then even such games as chess and checkers would be unscriptural. In the same way, a scientist can accept as a working assumption that all observations are a result of natural forces without personally believing this must be the case. If this seems hypocritical, consider what we do every day. Do we leave our homes in the morning with a tether tied to our front porches and wearing parachutes so that we can get back to the ground safely in case gravity would fail for a few minutes? No, we assume that gravity will always work even though we also believe that it is possible for God to suspend it. In fact, we assume a large number of the "laws of nature" will always work, never planning for an instance when they might not. In the same way a scientist can do his scientific work without having to abandon his faith in the omnipotence of God. We trust God to govern His universe in an orderly fashion unless He has a reason to do otherwise. In this way, some of the basic sciences are no more challenging to one's faith than mathematics.

There are, however, some real problems of which Christians must be aware. First, some fields of science are saturated with Humanistic thought. Some areas in anthropology, geology, sociology and biology are so interlaced with anti-Christian attitudes that one cannot work in them without endangering one's own soul or the souls of others. Moreover, presenting ideas to the unwary that could lead them to lose their faith in some fields can be an ever-present danger. For the good of their souls and the souls of others, Christians would be wise to avoid establishing their careers in such fields. Second, just as heavy exposure to lawlessness on television and in video games can dull a person's conscience to real violence, so also working in an environment where human reason is king can weaken a person's faith in the Lord. This is not unique to science, but it is a danger, particularly because some scientists hold a religious belief in the underlying assumptions of science. They view science as their route to success and fame, and they resent anyone who does not have the same devotion to it that they do.

At this point some might assert that all scientists are being dishonest by ignoring the evidence of the existence of God from nature. The heavens do indeed declare the glory of God, and no one can claim that he does not know about God from nature and from conscience (*For since the creation of the world God's invisible qualities--his eternal power and divine nature--have been clearly seen, being understood from what has been made, so that men are without excuse.* {Romans 1:20}). The problem is that the testimony of both nature and conscience can be attenuated through determined training. If one was raised in a rural area, one knows that on clear, moonless nights one can see an incredible number of stars. If one was raised in a big city, one might not know this because few stars are visible in cities. To be able to recognize God in nature, one has to see the immenseness of nature. Few young people today experience the natural world to any extent. They are raised in an environment of human-made things, where even weather is no longer a factor in many of their activities. Television, cell phones, computers and competitive sports dominate their lives. It is easier for them to believe in almighty technology than in an almighty God. In the same way, the natural law written in our hearts is overwritten by television and Humanistic education which, alas, has even infiltrated our Christian schools. Train up a child so that he sees only man's achievements, and he will worship man's achievements. Technology has completely disoriented people's religious sense, and it is easy for Humanists to credit all the good in the world to man's efforts, thereby pushing God aside. Humanists encourage this thinking because they see the belief in the supernatural as the biggest impediment to the world of which they dream. Humanists strive to turn the working assumptions of science into religious beliefs.

Appendix E – Examples of the difficulties with creation science

Because they believe there is no God, evolutionary scientists study an island and develop a model to explain its existence in its current state based on a series of evolutionary events over a long period of time. Creation scientists develop their own model showing that it could have come into its current state of existence in only a relatively few years and that therefore the evolutionary model is wrong. In building their model, creation scientists have assumed that the Lord used His natural hand to produce the island as it is today. But God may have used His non-natural hand and produced the island in a miraculous fashion, or He may have used each of His hands at different times in the process of producing it. Because both groups are basing their models on questionable assumptions and are constrained by the inherent limitations of science, neither can ever prove their models, and their debate is often reduced to name-calling. Creation science is at a significant disadvantage because it cannot modify its models in any way that would conflict with the Biblical timeline, no matter how compelling the evidence.

In the same way evolutionary scientists study fossilized bones and develop a model of the animals from which these bones came and how they lived many millions of years ago. Creation scientists develop models of how these bones could have been fossilized in only a few thousand years. Once again, however, creation scientists have assumed that the Lord used His natural hand to accomplish the fossilization. In fact, He may have used His non-natural hand to produce fossilized bones of animals that never lived. He may have decided for His purpose to create a world that appeared to have evolved but which didn't. He may have fossilized animals instantly after they died. The Lord is not required to play by the set of rules of natural sequences of events that are developed by evolutionary scientists or by creation scientists. Worse yet, unlike evolutionists who can propose a starting point which is at least clearly definable, the starting point of creation science is so uncertain that scientific study of any model it proposes is impossible.