

A Reformed View of Fictionalism and Antirealism in the Sciences

Phillip Broussard

Physics Department

Covenant College

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1 Introduction

What is the role of science in the life of a Christian? What can we expect of our work in the sciences and how should Christian nonscientists handle the pronouncements of science? These very important questions must be addressed if Covenant College is to prepare its students to “see creation as the handiwork of God and to study it with wonder and respect”, “reclaim the creation for God and redirect it to the service of God and humankind, receiving the many valuable insights into the structure of reality provided by the good hand of God through thinkers in every age, and seeking to interpret and re-form such insights according to the Scriptures” and “endeavor to think scripturally about culture so as to glorify God and promote true human advancement”.(Covenant College Purpose Statement)

Our call to be faithful stewards of God’s creation is clear from Scripture (Gen 1:26, 2:15, Psalm 8:6). To be a faithful steward of creation one needs to understand the workings of creation, as Kuyper pointed out: “In order to subdue the earth, a knowledge of the earth was indispensable, knowledge of its oceans, of its nature, and of the attributes and laws of this nature.”(Kuyper, p. 130) Clearly then knowledge is needed to be a faithful steward, but

who will obtain this knowledge? Do we leave the task to nonbelievers? Kuyper would see this as an error, as he states, “A Calvinist who seeks God, does not for a moment think of limiting himself to theology and contemplation, leaving the other sciences, as of a lower character, in the hands of unbelievers; but on the contrary, looking upon it as his task to know God in all his works...”.(Kuyper, p. 125) Therefore Christians are called to engage in science and to be stewards of their discipline. In addition, Christ’s call to believers to meet the needs of the poor and sick as well as those of other believers (Matthew 25:31ff) and unbelievers (Galatians 6:10) would imply that we also use the discipline of science to ameliorate the effects of the fall.

Not only are those Christians involved in the sciences charged with being faithful stewards of science, but even Christian nonscientists must face their stewardship responsibilities, especially in countries where public involvement with governmental spending is allowed. Science has had a positive impact in the lives of people around the world, whether through advances in agriculture, weather forecasting, computational or communication abilities, but it has also impacted humanity negatively (e.g., radioactivity or ozone depletion). If Christians are called to be agents of transformation in their culture (as taught in the “Christ and Culture” course here at Covenant), then as important issues arise in the culture that deal with science Christians need to be informed in order to engage the culture in a wise manner.

The goal of science then from a Christian perspective will be two fold. First as Scripture states, “Whatever you do, do it for the glory of God.”(1 Cor. 10:31) Clearly we should carry out our stewardship of the sciences so that God will be glorified. Our ability to see the faithful regularities in God’s creation opens new areas where we can praise God for His covenantal faithfulness. To Kuyper, this alone should inspire us to study science, as he states “Faith in such a unity, stability and order of things, personally, as predestination, cosmically, as the counsel of God’s decree, could not but awaken as with a loud voice, and vigorously foster love for science.”(Kuyper, p. 115) Second we see science’s goal as understanding the creation more fully so that as Christians we can both care for God’s creation and use it wisely as faithful stewards. We must however be aware that since science is carried out as a cultural activity by fallen humans, our goal of understanding the creation will be constrained. There are going to be limits to what science can tell us as well as our ability to understand the

created order. It is this issue, or the ability of science to tell us the truth of God's created reality that will be the focus of this paper.

How Covenant's students view science will be foundational in how they carry out their obligations to be stewards of the discipline of science and the use of science in the culture. Our students are typical of evangelicals in their views of what science is, what it can accomplish, and how it should be used. Some of these views will be seen to be hindrances to being faithful stewards of God's creation. I propose that views of the sciences that deny our ability to learn about the reality of God's creation (which I will discuss in full later) militate against the above goals and instead we should encourage our students to consider a view denoted as "Faithful Realism" (which I will more fully explain) as a way to be faithful stewards of science or the use of science in their culture.

2 The Relevance of General Revelation and Common Grace for the Sciences

Science as a discipline is fundamentally involved in the study of what would be termed general revelation and is being carried out by many who are not Christians. Therefore, what a Christian thinks about the role and results of science will be derived in part from their view of the relationship between special and general revelation and the issues of common grace and the antithesis. I want to consider some of the issues involved with these and consider how they are handled here at Covenant (primarily in the Christian Mind course) and how we would then consider science within that framework.

Special revelation is of course God's revelation of himself and his purposes in the Bible. General revelation is the term given to God's revelation of himself in his created order. (Psalm 19:1-4, Romans 1:20, Acts 14:17) Common grace is the concept that God not only extends care and good gifts to those who are believers, but also bestows them to nonbelievers (Matthew 5:45, Acts 14:17) and allows nonbelievers to have insights into God and his creation. (Genesis 4:20-22, Acts 17:28) Common grace is also connected to the idea that it is God who teaches us how to best use his creation and to understand it, as seen in Isaiah

28:23-29 where God states that he is the source of the farmer's knowledge. Along with the idea of common grace, we must keep in mind the antithesis, or the struggle between the kingdom of Christ and the kingdom of Satan. Christians must deal with how we balance special and general revelation and how much of the work of nonbelievers we take as true common grace insights.

How is the relationship between special and general revelation, or what has been termed the "two books" that God has given, handled here at Covenant? Dan MacDougall in his lectures for the Christian Mind class has consistently made the point that Christianity is a revealed religion by necessity due to God's nature and man's sinfulness. (MacDougall, pp. 9-10) MacDougall suggests that we must see the two books in a foundational relationship, where the Bible is the more foundational of the two, since it gives the purpose for creation, and is self interpreting, while nature is not. However, MacDougall also points out that without general revelation, we could not make sense of the Bible since it is communicated to us in human language. From Henry Meeter's work *The Basic Ideas of Calvinism* we again see that both the Bible and nature are revelations from God and we cannot ignore either one as we strive to understand who we are and who God is. (Meeter, pp 25-26) Tim Morris in his lecture to the Christian Mind class emphasizes the importance of revelation by stating "... revelation is necessary for any knowledge that we humans may possess." (T. Morris, p. 2) We are not autonomous creatures collecting information from what we study. Anything we learn must be revealed to us by our Sovereign Creator. Tim Morris points out the pitfalls with either overemphasizing general revelation at the cost of seeing the Bible as less relevant or minimizing the importance of general revelation. Either perspective would lead to a view of the two revelations as a "some kind of zero sum dynamic", where any increase in the authority of one automatically leads to a decrease in the authority of the other. He states "the major point is that there is an authority that is properly ascribed to general revelation, which should command our respect and care and that this authority, coming as it does from God Himself, is in no way inconsistent with the full authority of Scriptures" (T. Morris, p. 18) We can learn something from studying the world and it is not inherently in conflict with God's word. More than that, since both revelations come from God, both need to be paid attention to.

Given that general revelation should not be denigrated, the question is how to balance it with special revelation and deal with the conflicts that seem to appear between knowledge obtained from God's world and God's word? Sidney Greidanus has stated "...because the God who reveals himself in the Bible is the same God who reveals himself in creation, there can be no real conflict between the Bible and creation." (Greidanus, p 139) The use of the Bible in our work in the sciences is a delicate one to say the least. The typical view from the Reformed position is to consider that the Bible is addressed to our hearts, that it is a book written within a historical and cultural context, and that it is written in non-scientific language. (Greidanus, pp 140-141) As Meeter states, "Do not mistake the purpose of the Bible as if it were intended to be a textbook for the various sciences. It is not intended as such." (Meeter, p. 26) From Greidanus, "...the scholar's task is not to find ready-made answers in the Bible but to study reality in the *light* of biblical revelation" [emphasis in original] (Greidanus, p147). One should see general revelation as speaking with the authority of God, but needing to be correctly interpreted, since conflicts, though not inherent between the the two "books", will result due to our sinfulness and finiteness affecting our interpretations of both revelations.

Common grace insights, or the idea that nonbelievers can discover things that are true about God's creation is a perspective that has been an area of contention, even here at Covenant College. Do we ignore what nonbelievers tell us, since the truth is not in them (1 John), or go to the other extreme and consider them as important as Scripture? The antithesis is also an area that is wrestled over. Is the struggle here on Earth only between believers and nonbelievers, or does the struggle also lie within the heart of the believer or nonbeliever? At Covenant, clearly the extremes are not encouraged, but instead, as Jack Fennema taught in *Christian Mind*, "The truthful nuggets that emerge from common grace insights need to be 'framed' within a biblical worldview by the believer." (Fennema) Kuyper points out in his *Lectures on Calvinism* that many of our valued insights in areas such as engineering, medicine and the sciences have come from nonbelievers. (Kuyper, pp.121-122) As Christians engage in science, they will of course be confronted with how much to accept from their unbelieving colleagues. The tension will always be present as they strive to see which insights are true and which are false, and they must be wise in their acceptance or

rejection of the work of nonbelievers. As Fennema stated “The directional antithesis runs through all structures of life. It runs through all people and institutions rather than around them. Because of God’s common grace—God’s preserving presence, both good and evil (and the resultant warfare) exist in all people and institutions. The antithesis runs through every department of human life and culture” (Fennema)

3 Deficient Views of Science

Although there are many mindsets that can lead to a deficient view of science and preclude one’s ability to be a faithful steward, I want to focus on those views that deny the ability of science to draw conclusions about the nature of the created order or explain the various phenomena we observe. Assume that we propose a theory that explains some phenomenon (say an object falling to the ground) and makes predictions that we test. If we find that the theory is accurate, a natural question arises: What is the status of the theory, especially the components of the theory that are not visible to the observer or what are termed nonobservable entities (in the above case the gravitational force)? Do we hold that if the theory makes successful predictions that we are then justified in believing the theory is an accurate description of some realm in the universe and more, do we believe that the nonobservable entities are real? A realist is one who would say, yes, we are justified to some degree in believing the existence of nonobservable entities if the theory is successful, and the more the theory is verified, the more we are justified. On the other hand, an antirealist would say no, the success of the theory does not warrant belief in those objects.

Del Ratzsch gives a succinct definition of the antirealist and realist positions: “Antirealists deny that science can or should produce genuine knowledge of unobservable entities or processes.” (Ratzsch, p. 29) “The realist believes that in principle theories are to be taken literally to some degree, that to some degree they provide us with actual descriptions of the underlying structure of nature or with actual truth. The antirealist believes that theories cannot and do not tell us any such thing. Science may tell us much, but the information it generates does not constitute revelation.” (Ratzsch, p. 73) We see a marked difference between the two perspectives, not only in what science can tell us but also what it should tell

us. Ratzsch divides antirealist positions into three categories. (Ratzsch, pp. 78ff) The first is ontological antirealism, which denies the existence of hidden structures, entities or processes. The only real world is the observable macro-world of objects we can see and manipulate directly. The second is linguistic antirealism, which would hold “... that theoretical terms, such as electron, do not refer to real things and that if theoretical statements are true at all, it is not in virtue of or with reference to hidden, unobservable matters.” The final is epistemological antirealism, which does not deny the possibility that nonobservable entities might in fact be true, it is just that “there is little chance that our human theories are right and no way of ever finding out what the theoretical truth really is.” Each position has a different emphasis, but all of them deny some aspect of the explanatory nature of science.

Part of the struggle between realism and antirealism is the boundary between what is termed an observable and a nonobservable. Most philosophers of science (as well as most people) would have no problem saying that we can see that a table exists, or that it is brown, or that it is large, in contrast to the typical response that no, I cannot easily see that an electron exists, or how big it is, or what mass it has (much less its color). The distinction between observables and nonobservables has long been an area of contention as discussed by Matheson and Kline. A very clear statement of the antirealist position on a nonobservable (here an atom) is given by W.T. Stace, who states:

That atoms are not inferences from sensations means, of course, that from the existence of sensations we cannot validly infer the existence of atoms. And this means that we cannot have any reason at all to believe that they exist. And that is why I propose to argue that they do not exist—or at any rate that no one could know it if they did, and that we have absolutely no evidence of their existence. (Stace, p. 253)

To Stace, since we have no direct sensory perception of atoms, we cannot justify their existence from our sensory perceptions, and therefore atoms fall on the nonobservable side of the boundary, which in his antirealist position means they do not exist. (Clearly Stace is an ontological antirealist) I contend, however, that this observable/nonobservable distinction is nonexistent and that there are no such things as “brute” observables, anymore than there are no “brute” facts. In support of this, Matheson and Kline have a long discussion on observation and state at the end of it, “So we have *no* theory-neutral seeing,” [emphasis mine] (Matheson, p. 382) or no worldview-independent observations. Everything we observe

is influenced by our preconceptions. In order to distinguish between observables and nonobservables, we would need a sharp distinction in how they are perceived. One way would be to denote those things directly perceived by our senses as observables, and all the rest as nonobservables. However, if what Matheson and Kline state is true, then even our “direct” sensory perceptions are filtered through (as Reg McLelland would say) a “cognitive grid” and as such are not “brute” observables. Having said this, I would admit that there is a difference between my observation of a table and an electron, but it is my contention that the difference is quantitative, not qualitative.

Another deficient view of science, fictionalism, seems to be somewhat different from the more traditional antirealist positions. Here the issue is not the existence of nonobservables, but instead what we can infer from our observations. In fictionalism, the claim is made that although the theory and data may imply a certain result, it only appears that way to our observation and the actual truth is quite different. A clear example of fictionalism is the science of the Jesuits in the timeframe when heliocentric vs. geocentric views of the solar system were being discussed, which has been carefully discussed in the work by William B. Ashworth. With the decree from Rome that heliocentric views of the solar system were not compatible with the Catholic church’s teachings, the Jesuits faced a problem in carrying out their science, as Ashworth points out:

How to deal with the increasing superiority of heliocentric celestial mechanics? If the Jesuits had been realists, they would simply have proclaimed the system false, citing Scripture and church decrees, and refused to sanction the utility of an erroneous hypothesis. Such a position, while theologically quite sound, would have been very weak strategically; therefore Riccoli and other Jesuits instead revived the fictionalist stance, discussing heliocentric astronomy with great erudition and even considerable enthusiasm, but always with the caveat that it was *merely a hypothesis*, like dozens of other hypotheses that scientists adopted for convenience. [emphasis mine](Ashworth, p. 158)

The Jesuits’ fictional approach to science led to the view that “... astronomical systems were all fictional devices designed only to save the appearances of things, and that appearances have nothing to do with reality, which is the business of philosophers rather than astronomers.” (Ashworth, p. 158) One of the struggles at this time was which discipline held sway on stating the true nature of reality: astronomy (mathematics) or Aristotelian physics (philosophy). Galileo was championing the idea that the nature of reality was mathemati-

cal, which put him at odds with the more teleological perspective of the Catholic church at that time. Clearly though we see the fictionalist tendency in the Jesuits, who stated that although the heliocentric model was a useful calculational device, it could not be used to give any knowledge about the real motion of the planets.

My other example of fictionalism is the “Appearance of Age” perspective in Creation Science today. The idea that we might infer a much older age than is actually true is not a recent suggestion. In 1857 Philip Gosse, a British biologist and preacher, was struck by the geological evidence at that time which implied a much older Earth than several thousand years. He was convinced both of the accuracy of the dating as well as the age of the Earth that he inferred from his studies of the Bible. His solution to this conundrum was to infer that God created the Earth and life on the Earth with the appearance of age, or that the records that we can infer from tree rings, sedimentation layers, etc., were placed there by God and had not actually occurred. The idea that God created things with a deceptive age was not well received by his contemporary Christian audience, so his ideas died out for a while. (Ross, pp. 29-30) It is interesting that Gosse’s struggle with the results of science and his reading of the Bible is similar to, yet different from, what happened to Charles Darwin. Darwin was struck by the evidence he saw (both in geology and biology) that conflicted with his reading of the Bible. Darwin was also sure he was correct in his interpretation of both special and general revelation, therefore one source must be in error. While Gosse chose to assume the science was misleading, Darwin chose to say the Bible was in error. (MacDougall, p. 4) Both Gosse and Darwin showed a lack of humility in interpreting either the Bible or the results of science and assumed that there would be a conflict between special and general revelation, unlike the view that is promoted by Meeter and Greidanus, as well as others here at Covenant.

The resurgence of Creation Science in the 1900s is well laid out by Mark Noll’s *The Scandal of the Evangelical Mind*. This movement has popularized the “Appearance of Age” viewpoint in recent times, as can be seen by the following quotes.

The Bible’s account of the chronology of creation points to an illusion... The seeming age of the stars is an illusion... Either the constancy of the speed of light is an illusion, or the size of the universe is an illusion, or else the physical events that we hypothesize to explain the visible changes in light or radiation are false inferences (Gary North, quoted in Ross, p. 38)

From John Morris, president of the Institute for Creation Research (ICR), we have the following:

Simply stated, the idea of “creation with appearance of age” means that when God created, those things which He created might superficially have looked as if they had a history. When Adam was created, he no doubt looked like a mature adult, fully able to walk, talk, care for the garden, etc. When God created fruit trees, they were already bearing fruit. In each case, what He created was functionally complete right from the start—able to fulfill the purpose for which it was created. Stars, created on Day Four, had to be seen to perform their purpose of usefulness in telling time; therefore, their light had to be visible on Earth right from the start. God’s evaluation that the completed creation was “very good” (Genesis 1:31) necessitated that it be functionally complete, operating in harmony, with each part fulfilling the purpose for which it was created.

If a scientific observer today, with no knowledge of Adam’s creation, traveled back in time to Day Seven and tried to determine Adam’s age (or the age of a rock, or the age of a star), how could it be done? The scientist would rely on today’s human growth rates (or rates of radioactive decay, or the speed of light), and calculate how long it would take for this state of maturity to develop, and would come to a wrong conclusion.

This is because the world today is not as it was in creation. God’s creative powers are at rest now, and He is maintaining the creation using present laws of physics. The original created world, perfect and non-decaying at first, was subsequently cursed and made subject to decay and death (Genesis 3:17; Romans 8:20, etc.). Furthermore, even that world was destroyed by the Flood of Noah, so that the world we live in today is a relic of destructive processes, not creative processes. Any effort to apply present processes and process rates to creation is doomed to failure.

It is claimed by old-universe advocates that Romans 1:20 reveals that truth about creation and God’s character must be “clearly seen” from the study of the creation. Any unregenerate scientist, using valid theory and careful analysis, must be able to determine the age and origin of any object. Since secular scientists have concluded the universe began with a Big Bang, that must be the way it happened. God could not have created with the appearance of a Big Bang if He didn’t use that method, so that must be the way He did it. After all, God cannot lie!

But this position denies the clear Scriptural teachings regarding Creation, the Fall, and the Flood. Furthermore, it denies the very possibility of creation, for creation without the appearance of “age” is impossible.

God, in His sovereignty, knew that fallen man, living in the post-Flood world might wrongly conclude the age and origin of things. For just that reason, He gave us a clear record of what He had done and when He had done it. Furthermore, when we look at the evidence in light of what He has told us, the universe doesn’t even look old. The real evidence is fully compatible with an origin only thousands of years ago.

On the other hand, if fallen scientists extrapolating present process are right and the universe is old, then God has lied to us, for He clearly said He created all things in six days, not too long ago.(J. Morris, 5/14/2003)

Clearly this position shows a fictionalist perspective to reality. To John Morris, there will be

an inherent conflict between the true age of the stars, the Earth, etc. and what is measured using standard assumptions of science, due mainly to a sharp division between pre and post Fall reality. In fact to Morris, it would be impossible for God to create without a dichotomy between the reality and the perception. The problems with the above perspective are many. First the idea that God is somehow using the “present laws of physics” implies a mechanistic universe, which tends toward a deistic view, rather than the view espoused by Don Petcher that it is God’s word that sustains the creation, and what we view as laws of nature are our perspective on God’s covenantal faithfulness towards his creation.(Petcher, p. 3) Second, Wolters has written on the contrast between creative and sustaining acts of God and the supposed clear division between these is not so easily made.(Wolters, pp. 12-13) Finally, it is not denied that appearances can be deceptive to us. For example, the sun does appear to rise in the sky. However, as the issue of heliocentric vs. geocentric views showed, it is possible for us to ascertain the true motion of the planets. We have been blessed by God to be able to go beyond what are “mere” appearances. In the case of Adam’s age, there are far more techniques to determine age beyond just looking at the visual appearance of the individual. Rarely does one want to go into a discussion of what information could have been obtained if we would have performed a more detailed analysis, and with good reason, since these are all moot arguments at this point. The main issue is what was the intent of God in creating Adam and Eve fully grown? Was it to give the appearance of age without the actuality? It would be hard to exegete this point from the text, and as such this is not a sufficient proof text that God actually does create with the appearance of age for that purpose, which from John Morris is one of God’s intentions.

Although fictionalism seems to be different from the usual antirealist positions, it is clear upon looking carefully that it is a subset of antirealism. Ashworth states that the Jesuits were not realists and used a fictionalist perspective to view scientific theories. The “Appearance of Age” position would not say the theories are fictions, but the results drawn from the data and theories are. From Ratzsch’s description, we can see that both of these fictionalist perspectives fit into the epistemological antirealism category, since they do not deny the existence of nonobservables, as in ontological antirealism, but instead deny our ability to ever uncover the reality of what we observe by our observations, and deny some aspect of

the explanatory nature of science.

Now do these views hinder the field of science? For the case of classical antirealism, where the issue is whether say atoms, electrons, or quarks exists, antirealism fails as a system because it cannot “account for the success science has had in predicting entirely new phenomena, phenomena often observationally unrelated to either the phenomena for which the theory was originally proposed or to anything else previously known.” (Ratzsch, pp. 80-81) Most scientists tend to hold a realist view of the field they are working in, partly because it is hard to shake off the perspective that you are actually working with these “nonobservable entities” such as electrons. A reason from the standpoint of science, however, for holding a realist position is due to the successes that Ratzsch talks about, where disparate phenomena were found to be intimately connected by a theory based on some nonobservational entity, such as Einstein’s quantum hypothesis. An antirealist would not be inclined to hypothesize connections based on objects they do not believe in, and useful lines of inquiry would not be pursued, thus shutting down opportunities to expand our knowledge of God’s creation. One could argue that antirealism is not necessarily a hindrance to science since certain scientists, like Niels Bohr and Werner Heisenberg, are usually associated with holding antirealist views. However Ian Barbour points out that careful consideration of their writings shows that they were “. . . not denying the reality of electrons or atoms, but claiming instead that they are not the sort of things that admit of precise classical space-time descriptions.” (Barbour, p. 169)

It is clear that fictionalism is also hindrance to science. In the case of the Jesuits, although they had a “zest for experimental science” (Ashworth, p. 154), and were also known for precision in their scientific work (Ashworth points out that it was a Jesuit, not Galileo who actually first measured the value of acceleration due to gravity), Ashworth states “Thus the Jesuits practiced science on a wide scale, were able (and often inspired) investigators, made many important discoveries and inventions, and encouraged the involvement of others. . . . there still remains the unavoidable feeling that Jesuit science was somehow seriously deficient.” (Ashworth, p. 155) Why was this the case? From Ashworth, “The problem with fictionalism is that, like probabilism, it leads to excessive eclecticism and *discourages the asking of larger questions*” [emphasis mine] (Ashworth, p. 158) It is precisely this “asking of

larger questions” that forms a major part of science. If that is given up, the ability to use science will be stymied. As stated earlier, what drove the Jesuits to fictionalism was their theological position, summed up in the thirteenth Rule of Loyola: “If we wish to be sure that we are right in all things, we should always be ready to accept this principle: I will believe that the white I see is black, if the hierarchical Church so defines it.” (Ashworth, p. 159) Ashworth sees the Jesuits’ deficient science as an outgrowth of the tension with trying to “. . . see white as black, especially when others keep shouting White! White! . . .”

We can also see a deficient science in the “Appearance of Age” adherents today. Just as in the case of the Jesuits, the fictionalist stance for the “Appearance of Age” position is being driven by a theological position. Both have held to a particular reading of the Bible, and resisted the call of “White! White!” by taking a fictionalist position. In the case of the Jesuits, they did not stop doing investigations, but typically would view all scientific hypothesis as fictions, giving them equal weight, yet viewing none of them as true descriptions of the world. In contrast the “Appearance of Age” position sees neither the theories nor the data as false. What is false is the connection drawn between the two, so one cannot from the data make the claim for the age of an object. Mark Noll in his work points out the problems with the science of the Creation Science position (who have been the major proponents of the “Appearance of Age” view), such as a Manichaeian view of the knowledge about the physical world, whereby one divides the world into realms of light and darkness and no real knowledge can go from one realm to the other, and a stunting of one’s ability to understand the physical world.(Noll, pp. 196-197) As Noll states, “Actually looking at the earth or actually carrying out experiments has been *relatively unimportant* for creationists.”[emphasis mine](Noll, p. 198) which is in contrast to the Jesuits. I will show that exactly this lack of interest in studying the creation is also seen in my students that hold a fictionalist view.

How would these views see the relationship between special and general revelation as well as the importance of common grace insights? For antirealism the case is not so easy to make, however, it can be said that antirealism would *not* consider the information of science revelation as Ratzsch stated. Since science to the antirealist lacks the ability to explain what is going on at a nonobservational level, the Christian antirealist would have to deny

the ability of general revelation as being able to speak to knowledge at this level. It would also seem then that no common grace insights about this level could be true, so those would have to be discarded as well.

We can clearly see that the fictionalist approach to the sciences will also of necessity deny the ability to extract truth from certain studies of general revelation, and so deny the authority of that revelation. For both the Jesuits and the “Appearance of Age” advocates, observations from general revelation were denied the ability to give knowledge about God’s creation because of a perceived conflict with a reading of Scripture. This is clearly seen in the following quote by John Morris on the issue of special vs. general revelation.

Since science and the scientific method are limited to the present, how could fallible, limited scientists possibly reconstruct unobserved history? Origins events are one-time, non-repeatable, unique events, inaccessible to the scientific method. Empirical science, locked in the natural world as it is, can never succeed in reconstructing the supernatural acts of God without revelation, especially ultimate origins.

The “double-revelation theory” always results in placing the Bible in an inferior position to the musings of scientists. For instance, many Christians have attempted to equate the Big Bang with the “In the beginning” of Genesis 1:1, and twisted Scripture to make it fit. But every time today’s astronomers turn on the Hubble telescope, they discover more problems with the Big Bang. Soon the Big Bang will fizzle. (John Morris, 7/24/2003)

The problems inherent with the perspective of John Morris above and earlier are many, such as a lack of understanding of the full realm of scientific method and a very poor understanding of the findings of science in regards to the the Big Bang model. More troubling, however, from a theological perspective is the dualistic view of God’s action in the world (supernatural vs. natural actions of God) which has been criticized by Don Petcher in his work,(Petcher, pp. 2-3) a view that allowing general revelation some authority must therefore reduce the authority of special revelation in the “zero sum dynamic” that Tim Morris discussed earlier, and the idea that there is only one “clear Scriptural teaching” on the issues of creation, in clear rejection of the various allowed interpretations of Genesis 1 within the PCA.

In addition, the fictionalist must hold a very low view of common grace, since the insights about general revelation will come primarily from unbelievers in this theology, as it is not worth studying for those who “know” the correct view. Those insights from unbelievers, derived as they are from a source without authority (here general revelation), cannot therefore

be true. As John Morris states, “All scientists have inherited from Adam a cursed brain and a fallen mind. Most scientists are non-regenerate if not anti-God. How can we expect them to come to truth, especially about origins?” (John Morris, 7/24/2003) To John Morris, the antithesis does not run through people, but between those who believe as they do and those who do not. Knowledge about truth from the above quote cannot be expected to come from “non-regenerate” people, which clearly shows the Manichaeian tendency in this movement, and would not fit into a reformed view of common grace and antithesis.

Finally, we can see from the theological perspectives of the fictionalist positions that there is a strong lack of humility in their interpretation of Scripture, just as there was a lack of humility in Gosse and Darwin in their interpretations of either Scripture or science. Since humility is one of the primary things that God requires of us (Micah 6:8), it must mark our attitude in all areas of life, including our ability to interpret the revelations of God. McCartney and Clayton in their work *Let the Reader Understand* emphasize that there are no “brute facts”, and what we get out of scripture depends on our presuppositions in approaching the text. (McCartney, pp. 59-62) Noll points out that “...no observations are ‘simple’ and no texts yield to uncritically ‘literal’ readings.” (Noll, p. 197) Ignoring these issues as has been done by those holding the fictionalist view shows a great lack of humility.

4 Views From the Students

As I stated before, there are various views of science that hinder our students’ ability to engage the field of science and act as stewards of the knowledge they are given. One of the classic issues that the students (and professors!) must deal with is poor science education in their background. When I teach astronomy here at Covenant and present the Standard Hot Big Bang model of cosmology, some students struggle with it because of their past education, as shown in these quotes from students:

“Big Bang” The phrase is one that I had been taught throughout my years at a Christian junior high and high school to cringe at the mention of and shun completely-no questions asked and no answers given.

However one of the main misconceptions Christians have about the big bang theory is that both space and time existed before its occurrence. ... This thought pervades the minds of many and drives them to immediately dismiss the idea of the big bang theory...

In the past I thought that the big bang theory was trying to disprove God as the creator of the universe. I would often hear Christians linking the big bang to the theory of evolution and say that this was the secular community's way of explaining creation. This became more or less my arguments for why I did not like the big bang theory.

Growing up in a Christian school from kindergarten until graduation, I was taught the most conservative view of science. Evolution was completely wrong, the gap theory and the big bang were explained and then quickly set aside as an event that never occurred. It was unbiblical at my school to believe in the big bang theory at all. I never tried to think otherwise, mostly because I was not presented with an entirely accurate description of what the big bang actually was.

I have also seen this type of education in the Christian community, where a theory of "evolution" is brought out and then easily defeated, when in reality it was nothing more than a "straw man" argument. One of my burdens is for my students to know what is actually being said in the world of science, not poor "straw-man" arguments, so they can engage in critical thinking on the issues in their culture.

The main view that I run into in my astronomy students which hinders science is the fictionalist view. When students are presented with material that implies a very long time for the existence of the Earth (say K-Ar radioactive dating) or for the universe as a whole (galactic redshifts, stellar analysis, the cosmic microwave background), there is often an immediate rejection of the scientific discussions. This rejection of the material will take on one of two forms. The first is a criticism of the scientific approach or analysis. For example, in K-Ar dating, one may criticize the assumptions made, or the procedures used to carry out the measurement. In the study of galactic redshifts, one may hypothesize an alternative explanation for the spectral shift observed that is not due to Doppler shift effects. These criticisms are actually useful as they force both sides in the discussion to sharpen their approach in understanding what is observed. It is the second form I want to look at here more closely. In this response, students will not deny the conclusions drawn from the data. For example, they will agree that the data imply that a galaxy is located a certain distance away and is moving at a certain velocity, or that the krypton and argon levels in a rock are as measured and under the assumptions of science would imply that the rock is so many billion years old. Instead the student will simply state that "God could have made it look that way", as shown in the following quotes from the students' papers on the Big Bang theory:

Since God is all powerful, why could He have not allowed created [sic] the universe

in six days? Why could He have not even made the universe to look as if it had aged greatly?

However, I believe that God created everything with the appearance of age. The universe was created in the middle, jumpstarted to a particular point, in order to compliment creation on earth. God did create a set of laws to govern what he made but it appears that these laws can only explain how the universe works from 8000 B.C. on.

The Earth looks much older than 10,000 years. Why is this?... The answer to the appearance of an old earth has to do with the flood narrative in Genesis 6 ... When the flood subsided, the earth emerged looking much older than it actually was.

The students' justification for this position will usually draw on the same test case as John Morris used, i.e. the apparent age of Adam and Eve in Genesis 1 and 2, which I have discussed earlier. For these students who hold to an "Appearance of Age" view, their fictionalist stance tends to shut down any consideration of scientific issues as seen in the following:

This theory (Big Bang) makes us very insignificant where as [sic] the Bible places the earth in the center of known reality

This paper ... was written to simply try to encourage all Christians to believe by grace through faith that God is the creator of the universe in six-twenty-four [sic] days, and to take a lead role in the field of science and glorify God in doing so. We need not get wrapped up in or absorbed in complex theories like the big bang ...

God is infinite, and soon we will be. We cannot understand nor comprehend this concept, so we should stop trying understand [sic] the concept of a limitless and infinite universe ...

I don't have any desire to question this further; I believe that there is a possibility that those six days are not literal "days", but frankly, I'm not interested in digging any deeper.

In essence, their perspective is God could have created reality to appear that way, so I don't have to really believe the scientific findings, and there is no need to pursue study of the topic further. To the "Appearance of Age" proponents, including my students, there is no possibility of obtaining real information about the age of stars, the universe, or the Earth from observation. This belief then immediately calls into question any information that is obtained in our studies of these objects, and begs the question, "Why then should we study them?". As I have seen in my students, and as Ashworth noted in the Jesuits, it quenches any desire to probe deeper, to seek connections, and kills scientific inquiry, just in opposition to what Kuyper said, in that a proper view of God should inspire a "love of science".

5 A Humble Proposal

Having seen that antirealist and fictionalist positions lead to deficient science, and inhibit our student's calling to be faithful stewards of science in the culture, what view of science should I encourage in our students? If antirealist positions tend to remove the explanatory power from science, then it would seem obvious that a realist position would be preferred. However as I have emphasized earlier humility must mark the life of all Christians and it is easy to see that humility is *not* a hallmark of naïve realism. Naïve realism would say that if our theories make accurate predictions then we are required to say that the theory is an accurate statement of the underlying reality. The success of Bohr's theory of the atom would then imply that electrons move in only certain circular orbits with fixed velocities, which we now know is not the case. Naïve realism requires our belief in the truth of the theoretical model, which is hardly a humble position to take regarding the accuracy of the model. The history of failed ontologies in the sciences (energicist view of matter, phlogiston model of combustion, the caloric model of heat, the Sommerfeld model of the atom to explain fine structure in atomic spectra) should teach us that we cannot hold to any theoretical model, including the Big Bang model, as the final statement of reality.

One might say that with my criticism of fictionalism and antirealism, I run the danger of leaning too heavily on humanity's ability to infer the nature of reality from observations. Certainly one must acknowledge the effects of our finitude and the Fall on our ability to study and contemplate the creation. Perhaps an antirealist position would be one where we could be safely assured of never falling into a sense of pride in our ability to know just how God has made His world. When scientists claim that we will be able to figure out just how everything fits together, as Stephen Hawking states in his book *A Brief History of Time* "... our goal is nothing less than a complete description of the universe we live in", (Hawking, p. 14) isn't a Christian response to run the other way from the idea that humanity can know it all?

The idea of retreat into antirealism or fictionalism seems to smack of what Niebuhr terms the "Christ against culture" response. In his discussion of this response, Niebuhr brings up the example of Tolstoy who had a strong dislike of the sciences, so that to Tolstoy, "The ex-

perimental sciences devote great energies to confirm a dogma that makes the whole enterprise false, namely the dogma that ‘matter and energy exist,’ while they do nothing to ameliorate man’s actual life.”(Niebuhr, p. 63) It is interesting that the “Christ against Culture” motif tends toward gnostic dualism, as Niebuhr states, “At the edges of the radical movement the Manichean heresy is always developing”,(Niebuhr, p. 82) exactly what Noll pointed out in the Creation Science worldview. However, neither should we choose the “Christ and culture” model, where we let the sciences determine how we view God’s creation. What is needed instead is a model of science that allows us to engage in the “Christ transforming culture” model of Neibuhr.

One answer that allows us to keep a humble attitude towards our understanding of nature yet still seeks to look for connections in our theories can be termed “Faithful Realism”. (I thank Bill Davis for the terminology) This view is built on the “Critical Realist” positions of Ian Barbour and John Polkinghorne, which they feel explains the success of science yet takes into account the finiteness and sinfulness of man. Polkinghorne writes “It is a realist position because it claims the attainment of increasingly verisimilitudinous knowledge of the nature of the physical world. It is a critical realist position because that knowledge is not directly obtained by looking at what is going on, but it requires a subtle and creative interaction between interpretation and experiment.” He does not see science as completely distinct from other human endeavors, since all human knowledge is personal, but science is different since it has the ability to put things to a test. “Critical realism is a philosophical position based on the actual experience of the scientific community, rather than on a claimed abstract necessity that things had to be this way.”(Polkinghorne, p. 17) Barbour claims that the Critical Realist views models (and nonobservables) as “. . . to be taken seriously, but not literally; they are neither literal pictures nor useful fictions but limited and inadequate ways of imagining what is not observable.” (Barbour, p. 117) There is an inherent tentativeness to this perspective, as Barbour states, “. . . science does not lead to certainty. Its conclusions are always incomplete, tentative, and subject to revision.”(Barbour, p. 110) I will point out that both Barbour and Polkinghorne have allowed their view of science to strongly color their reading of Scripture (Both of them use evolutionary models to interpret the history of Scripture and have a strong leaning towards the Process Theology camp). It is not my point

to let my view of science drive my interpretation of Scripture. The question before us is how do we view science?

“Faithful Realism” would see the goal of science as I stated earlier, first to glorify God and second to study God’s creation in order to carry out the call to be a faithful steward. “Faithful Realists” recognize that everything was created by God, and as such the creation is contingent and must be studied in order to carry out the above goals. They also recognize the effects of the fall, knowing that they cannot hold onto the models created as truth, but also recognize that the work of science is moving towards better descriptions of the world. Models and nonobservational entities will be seen as not merely pragmatic, but glimpses of God’s created order, all the while recognizing the tentativeness that must be displayed about their belief in the truth of the models. They are cognizant of the fact that they cannot see all ends and are open to possible connections that science allows, even when they do not seem to be connected. (Hamilton, pp. 17-19) They recognize that Christ’s work allows them to engage the sciences “in awareness of the power of the Lord to transform all things by lifting them up to himself” (Niebuhr, p. 195) In addition, they realize that common grace allows them to use the results of those not in the kingdom, because God has graciously allowed non-believers to have insights on the created world, and those are worthy of study and use. They also are cognizant of the need to use Scripture to guide their thinking on God’s created order and the need to remain humble in their interpretations of both God’s word and God’s creation.

6 Conclusion

In the interest of full disclosure, I have not settled on which of the four allowed positions on creation within the PCA I hold to. I do present the Standard Big Bang theory as the best working model to explain what we observe in the universe around us, while at the same time warning my students to not invest themselves too heavily in that theory in order to “prove” God. Mostly I desire that my students see the wonder and awe in God’s creation and be faithful in their use of both His creation and the knowledge that he has allowed us to receive.

Clearly I have not fleshed out in any great detail the “Faithful Realist” position. It is my plan to continue thinking on these issues and see how they can be further developed as I continue to teach the sciences here at Covenant. But now having criticized the antirealist and fictionalist positions, how will I encourage my students to be “Faithful Realists”? I recognize that I may never change anyone’s mindset about the sciences through my classes (or this paper!). My hope is that I will continue to love my students, made as they are in the image of my creator, and to treat them with respect, regardless of how they view “my field”. My plans are to use some of this material in future classes of Astronomy, and also to touch upon the antirealist/realist discussions in lab science courses, so that students are made aware of these issues.

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