

Statement on Integration of Faith and Learning

Deborah Haarsma, Fall 2005

The Christian foundation of science

As Reformed Christians, we believe that our faith in Christ should permeate all aspects of our lives. Every activity, every thought and word, should be centered on Christ and transformed into service in his kingdom. Not only is every square inch of the earth under Christ’s lordship¹, but every cubic megaparsec of every spatial dimension of the whole infinite universe is owned and governed by him (as I’m sure Abraham Kuyper would agree). Yet when Christians study galaxies, sand dunes, bacteria, or helium atoms, they use the same scientific method and the same particular techniques as their peers in the scientific community. We successfully collaborate on experiments with scientists who follow worldviews vastly different than ours, such as atheism, relativism, or Buddhism. How is this possible? Why don’t our worldviews lead us to different scientific conclusions? Some say it is because science and nature are free of worldview influence. Others say that scientists are “objective” and set their beliefs aside when they work in the lab or observe with a telescope. Here I will argue against this: basic scientific research is a Christian response to the natural world God has made, even though its methods and results look identical to those of non-Christian scientists.

First, remember that all scientists (of whatever worldview) hold certain beliefs which cannot be proved from science, yet are necessary in order to do science. Science is *not* worldview-free, but is based on beliefs not found in science itself. Some of these beliefs are listed in the left column below. These beliefs make up *part* of the worldview of every scientist.

Beliefs necessary to do science	Some Christian beliefs
Humans have the ability to study nature and understand more of how it works.	We are made in God’s image (<i>e.g.</i> Gen 1:27), which includes the ability to understand God’s creation
Nature operates with regular, repeatable, universal patterns	Nature is not filled with capricious gods, but ruled by one God in a faithful consistent manner (<i>e.g.</i> Gen 1, Ps 119:89-90)
Observations and experiments are needed to build scientific models which correctly describe these patterns	God’s creativity is free, but we are limited and fallen (<i>e.g.</i> Job 38), so our scientific models must be tested by careful comparison to the Created world
Science is worth doing	We are gifted by God and called by God to study God’s handiwork (<i>e.g.</i> Gen 1:28, 2:19-20, Prov 25:2, Ps 19:1)

Next, consider some relevant Christian beliefs, listed on the right. As you can see, these are related to and naturally give rise to the scientific beliefs listed on the left. The scientific method (which all scientists use) is based on the beliefs in the left column, but for Christians these in turn are based on the beliefs in the right column. Thus, Christianity provides a philosophical foundation for how and why we do science. This means that science can be a fully Christian activity, and there is no sense in which Christians set aside their faith to do science. Yet scientists of all worldviews can

work together using the same methods and results, because they share the beliefs necessary to do science, even if their worldviews disagree about who God is and the purpose of human existence. Note that some worldviews are *not* conducive to doing science, because they directly contradict the beliefs listed on the left (for instance, an adherent of animism cannot believe that nature operates with regular repeatable patterns).²

While Christianity provides a foundation for science, it does not direct particulars such as the scientific conclusions of an experiment or what experiment should best be done next (*e.g.* Christianity does not nudge me to study gravitational lenses rather than star formation).³ Rather, the Reformed tradition proclaims that “All Truth is God’s Truth”. Whether we study the tiniest elementary particles or the largest galaxy cluster, we will never come across an object or physical process that did not originate in God. Thus we need not fear the scientific method – studying the universe using the beliefs above will only deepen our understanding of God and His revelation in nature, not lessen it.

Dealing with Apparent Conflicts

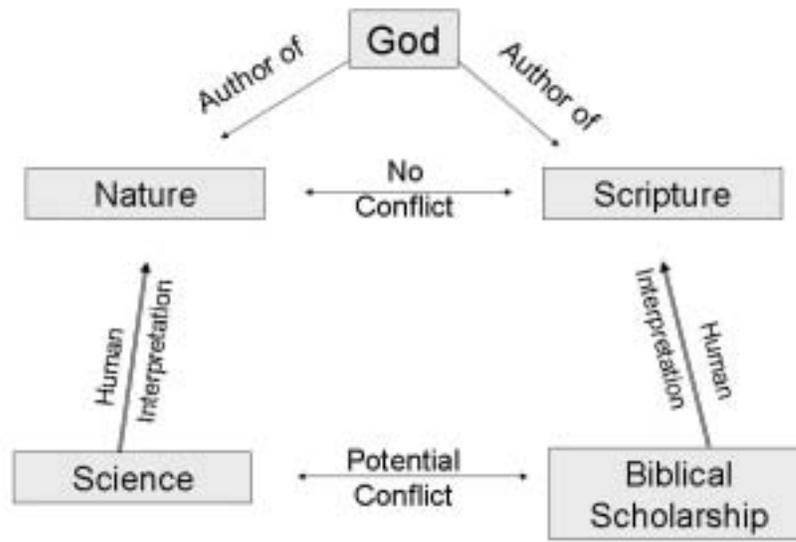
Occasionally, however, a scientific result will appear to conflict with the Bible or Christian doctrine. In these situations, it is not appropriate to ignore scripture and assume the scientific result is correct. Nor is it appropriate to assume that our interpretation of scripture is correct and ignore what God has revealed in the natural world. Rather, we must remember that God has revealed himself in two books, Nature and Scripture. The Belgic Confession states “The Means by Which We Know God” in Article 2:

We know him by two means:

First, by the creation, preservation, and government of the universe, since that universe is before our eyes like a beautiful book in which all creatures, great and small, are as letters to make us ponder the invisible things of God: his eternal power and his divinity, as the apostle Paul says in Romans 1:20. All these things are enough to convict men and to leave them without excuse.

Second, he makes himself known to us more openly by his holy and divine Word, as much as we need in this life, for his glory and for the salvation of his own.

This concept of “two books” provides an excellent framework for dealing with apparent conflicts between science and Christian faith. I illustrate the concept this way:



It is *impossible* for the books of Nature and Scripture to be in fundamental conflict with each other, since they were both spoken into being by God. God cannot be in conflict with himself. The conflicts arise at the lower level, where the human interpretation of one or both books may be in error. The human endeavors of science and Biblical hermeneutics are both corrupted by the fall. Thus, when we encounter an apparent conflict, our response should be to examine *both* the science *and* the hermeneutics more carefully, to find and correct the error in our human understanding. We should not ignore one side or the other, but hang on to both with the good hope that ultimately we will grasp the underlying unity of God as author of both revelations. Thus, my Christian worldview causes me to examine certain scientific claims more skeptically than my non-Christian colleagues, and to study certain scripture passages more carefully than my fellow Christians.

The Heavens Declare the Attributes of God

Discussions of “science and faith” typically center on apparent conflicts between the two. Yet the primary references to the natural world in the Bible are in the context of worship or in illustrating God’s character (*e.g.* “The heavens declare the glory of God” Ps 19:1). It is essential that, in the midst of intellectual engagement of issues, we do not forget to respond to the natural world by worshipping its Creator. In my studies of the heavens, I hear them declaring not only God’s glory, but also his other attributes, such as beauty, creativity, faithfulness, immensity, and intricacy. John Calvin lists more attributes: “The whole world is a theater for the display of the Divine goodness, wisdom, justice, and power.”⁴

Scripture, as God’s special revelation, is a clearer guide to his character than the natural world. But nature, God’s general revelation, enhances this knowledge by *illustrating* God’s character in ways that words on a printed page could never do. The view of the night sky from a dark location, with the Milky Way sparkling overhead, displays God’s glory in a way accessible to people of all cultures. The recent discovery of stars exploding in “hypernovae”, which shine for a moment more brightly than thousands of galaxies, displays God’s power in a way we couldn’t detect until gamma-ray telescopes were built in the last few decades. Scripture teaches us that God is glorious and

powerful, but it is nature which *demonstrates* this on a scale that strikes our hearts and minds with amazement.

As science and technology increase our understanding of the physical world, these new discoveries in turn increase our understanding of God's character. Microscopes and telescopes, supercomputer models and space probes, all reveal parts of Nature that are beyond our unaided senses. Calvin wrote, "If a small portion of God's works ought to ravish us and amaze us, what ought all his works do when we come to the full numbering of them?"⁵ We now understand abundantly more of God's works than was known in Calvin's day, and each reveals more of God's faithful governance and extravagant creativity

The Pedagogy of Science and Faith Topics

Since arriving at Calvin, I've thought carefully about the best methods for discussing issues of science and Christian faith with students, particularly issues of origins and the age of the universe. Here are some of the principles and practices I've found that lead to students to a deeper, more thoughtful understanding of all sides of these issues.

First, I emphasize worship in response to God's creation. In courses that meet Natural World core, I start nearly every class period with devotions related in some way to the astronomical content we've been studying, such as reading a Psalm or playing a recorded praise song. This sets worship front and center where I believe it belongs. It reminds students that science is not a challenge to faith, but something that enhances faith. In addition, it shows students something of my personal faith life, which helps them respect what I have to say about origins later in the semester - they know I am speaking not only as a scientist, but as a Christian who loves the Lord.

I sequence the science and faith material carefully to allow students a sensible intellectual journey through these issues. Rather than giving one lecture at the beginning of the semester (which students typically forget or don't take seriously), I incorporate the material in lectures and devotions throughout the semester as it is triggered by the scientific content being covered. In some courses I have even rearranged the sequence of scientific topics to allow the faith discussions to occur in a more natural sequence. As an example, here is the sequence of topics I use in Astr110 and Astr112. I do not mention the big bang or the age of the universe in the first week, since students do not yet have the tools to process the issue. Instead, I start with worship and the Christian foundation for doing science. A few weeks into the semester, we discuss a historical case where science and faith appeared to conflict (the Galileo incident), which introduces students to Biblical hermeneutics and strategies for dealing with conflicts, without the high-stakes pressure of the origins issue. Several weeks into the semester, we get to the first astronomical object that is billions of years old, and at that time we cover the origins issue carefully in readings, lecture, and class discussion. Then students have several weeks to write a paper in which they state their own views on the issue and respond to the views of others. At the end of the semester, I emphasize the principles all Christians agree on (e.g. God made the universe, it displays his glory, and together we praise him for it), so that students do not get overly discouraged by the tensions of the origins discussion.

When discussing an issue like the age of the universe, I use several approaches to encourage students' intellectual growth, approaches which are used by Calvin faculty in many disciplines. I start by having students study the Biblical accounts, recognizing the authority of scripture while also thinking deeply about how to interpret it. I force students to see there are more than two views on the issue (e.g. the choice is not just *God made the universe 6000 years ago* OR *the universe was not made by God*) by discussing a list of 10 different ways Christians have interpreted Genesis 1; this leads naturally to a discussion of Biblical hermeneutics. I mention views held by Christians around

the globe and throughout history, to show the broader scope of Christian thought on origins. During discussions, I teach students (explicitly and by example) to not attack the intelligence or faith commitment of Christians who hold views different from their own. Finally, I do not downgrade students who hold views differing from mine, but grade their papers based on how well they explain and defend their view.

In Spring 2005, I developed a new science and faith curriculum for Astr212: Extragalactic Astronomy and Cosmology. Students in this course are science majors who have already taken a few courses that meet Natural World core, and thus are prepared to consider more difficult issues. I set aside 5 class periods for discussions, around the following topics:

1. Christian basis for scientific practice, in particular historical vs. experimental science
2. Interpretations of Genesis 1&2, Psalm 104, John 1:1-5, Colossians 1:15-20
3. Worldview implications of the universe having (or not having) a beginning in time
4. Fine-tuning, the anthropic principle, and the Multiverse
5. Human significance in a vast cosmos

Before each discussion, I distributed a reading packet which typically contained several different Christian and non-Christian views on the issue at hand. Students brought their reactions to the discussion, then turned in a one-page reflection paper in the following class period. This kept the student (and faculty grading) work load modest while still prompting significant intellectual growth for students on each issue. I found the discussions personally rewarding, since we could explore topics in more depth than the 100-level courses, and students offered new ways to verbalize and approach issues that prompted me to refine my own views.

My Calling

As a college student, I felt God calling me to live as a scientist in the church and as a Christian in the scientific community. I am delighted that God has brought me to Calvin College, and given me this vibrant intellectual faith community in which to work out my calling. In every class I teach, I share the wonder of God's universe with God's people, in hope that they will also respond with worship and service.

¹ Abraham Kuyper, inaugural lecture at the Free University of Amsterdam, 1880

² Loren Haarsma, "Does Science Exclude God? Natural Law, Chance, Miracles, and Scientific Practice", in *Perspectives on an Evolving Creation*, ed. Keith B. Miller (Eerdmans: Grand Rapids) 2005

³ Steve Wykstra (lecture in Christian Perspectives in Science series, 2004 October 29) discusses three levels in relating worldviews to science: the worldview level, the "exec" level (extra-empirical commitments which guide science, similar to my "beliefs necessary to do science"), and the "nitty-gritty" level (where experiments are done and scientific conclusions drawn). The worldview level can impact the "exec" level (as I've described), and the "exec" level can impact the "nitty-gritty" level by guiding a scientist's approach (such as influencing criteria for judging which theory has more scientific merit). Thus, worldview influence on science comes by way of the "exec" level commitments, rather than direct alterations of scientific conclusions.

⁴ John Calvin, Commentary of the Psalms, 135:13. Calvin's theater metaphor is discussed more fully in "The World as a Theatre of God's Glory" by Belden Lane, *Perspectives*, November 2001, 7.

⁵ John Calvin, Sermon on Job 39:22-35