CHRISTIANITY AND SCIENCE: AN ADVENTIST PERSPECTIVE

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CONFLICT BETWEEN RELIGIOUS AND SCIENTIFIC WORLD VIEWS

God's interaction with the creation

In Bible times God was seen as the direct cause of all that happened in nature. He controlled the weather—the rain to fall on the just as well as the unjust, the plagues of Egypt, the drought in the time of Elijah. God caused leprosy and blindness as punishment. He was directly responsible for fertility (Sarah and Hannah).

Most of the founding fathers of science studied nature to learn how God works. St. Thomas Aquinas pointed out the need for faith where reason couldn't explain. Newton envisioned a mechanistic universe, but one where God made adjustments to keep it working smoothly.

As more and more was understood about the natural world, a feeling came in the last century that given enough time all phenomena could be explained by science. If God's direct agency was not needed for the weather, for health, and for fertility, then perhaps there was no need for Him at all, even for life and its origin. The explanation, "that's just the way God did it", appeared to inhibit science. The god-of-the-gaps argument fell into disrepute as more and more of the gaps were filled by scientific explanations.

The scientific method

The scientific method came to be seen by many as the best and only method for arriving at truth—a method that is objective, rational, reductionist, deterministic, and naturalistic.

Science is seen as *objective*, independent of the observer and his religious or political bias, with no place for emotions or feelings. This feature provides for a common bond between scientists of different political or religious persuasions.

Much of science is *rational* and can be studied by logic and reason, for which mathematics provides a tool. This leads to the belief that in principle all areas of human experience can be understood by human reason.

A *reductionist* approach assumes that the whole is no more than the sum of its parts. The natural world can be reduced to its simplest form to study, with the complete picture being built up of the independent pieces.

The scientific method assumes that the natural world is *deterministic*. Direct cause and effect relations make scientific observations repeatable and scientific models falsifiable. Observations about N-rays, the fifth force, and cold fusion could not be consistently repeated, and models about Lamarkianism and the aether could be falsified, so none are still part of science. The criteria of repeatability is more difficult to apply to the historical parts of geology, evolutionary biology, and cosmology, but is made possible by using the dictum that "The present is the key to the past". The deterministic nature of the world gives scientific models their predictive power, for example in filling in the table of the elements and with relativity. A deterministic world view allows for no beginning to the universe—a beginning would be an effect without a cause.

A *naturalistic* world view sets up a philosophical framework where man explains the workings of nature without invoking the supernatural. That this philosophy has worked so remarkably well in the physical sciences, has led to the belief that it can work in other areas as well. In biology, a naturalistic world view does away with teleology and any explanations based on a Designer.

The development of conflict between science and religion

Probably one of the most dramatic incidents in the history of the relation between science and religious faith was the condemnation of Galileo by the church in the 1600's. Galileo claimed that the earth moved around the sun, in contrast to the religious belief that the sun moved around the earth. In describing this conflict one author states:

> "Honest seekers after truth have been shocked by the attempt to suppress the claim that the earth moves and have seen in the trial of Galileo decisive evidence that religion is dangerous, ... especially, when pursued by sincere men who consider themselves the stewards of God's revealed truth." (Lindberg and Numbers, p.114)

However, there are two sides to this story and Galileo was not without fault. (Hummel) The conflict over the fixity of species and evolution in the last century is the other prime example, with the Scope's trial in this century as a focus point in the United States.

The two best-known Victorian versions of the conflict thesis are John William Draper's *History of the Conflict between Religion and Science* and Andrew Dickson White's *A History of the Warfare of Science with Theology in Christendom* where numerous examples are given to make the point. There is a conflict, but the case is often exaggerated. For one example, a flat earth was not the generally accepted church doctrine of the Middle Ages (Gould).

Today, science classwork rarely includes any references to religion. However, Christianity had an important, positive influence on the development of science.

COMPATIBILITY BETWEEN RELIGIOUS AND SCIENTIFIC WORLD VIEWS

Modern science developed in a Christian framework in western Europe

The *personal* God of Christianity is separate from nature. Abstract laws are reasonable, and experimenting on nature is not a frightening probing of the deity. In contrast, the impersonal nature gods of other religions made abstract natural laws unrealistic and experimentation on nature a frightening prospect.

From the Judeo-Christian monotheistic heritage, God is seen as the *law giver*. His creation should then be amenable to study using rational inquiry of cause and effect relationships. In contrast, the irrational and arbitrary gods of other cultures with their polytheism and warring factions would result in a natural world where rational inquiry would be useless.

The Genesis account pictures God creating a *world that is good*, and thus worthy of man's study. Manual labor for study is not degrading. For the Christian, and especially in the Puritan work ethic, science was an attractive vocation and its goal was to give glory to God. In contrast, Greek culture held philosophy in high regard, but manual labor was for slaves. The real world was not perfect anyway and, if studied, would quite likely give erroneous results; only ideas were perfect.

The Christian God is *free to create* as He chooses in any one of many ways. Therefore, man must study nature to find out how it functions, rather than using philosophy to determine how nature must behave. In contrast, the Greeks modeled nature indirectly using philosophy, rather than directly from nature itself. They believed that nature could operate in only one way, that philosophy could determine that way, and that there was no need to experiment.

The Christian picture of God (personal and lawful) and how He creates (good and freely) set an excellent framework in which to study nature and form the foundation for the present scientific method. In addition, the church of the Middle Ages was the patron of education, since literacy was needed for Bible reading and logic was needed to defend the Christian faith. (Pearcey and Thaxton)

Founding fathers of science who were Christians

Sir Isaac Newton (1642-1727) developed theories of light and of universal gravitation and shares the honor of inventing the calculus with Leibniz. Newton's science was closely related to his theology. In the General

Scholium of his *Principia*, he states that its purpose was to establish the existence of God. It was to combat atheism, challenge the mechanical explanation, and point to the need for a wise and benevolent deity and an intelligent Creator. He wanted certainty in his beliefs and to use the Bible as a clear rule, so he had a well defined set of rules for interpreting the Bible. John Locke said that Newton had few equals in Bible knowledge. Newton believed that he was part of a remnant, chosen by God to restore the interpretation of the Bible. Later in life he wrote on prophecy and the chronology of ancient kingdoms. (Westfall; Mandelbrote)

Michael Faraday (1791-1867) was a leading scientist of his generation. He is known for his pioneering work in electricity and magnetism, including the concept of electric fields. He is honored by having the unit of capacitance named after him—the farad. He was also a fully committed Christian who based his religion on a literal interpretation of the Bible. Faraday belonged to "a very small and despised sect of Christians, known, if known at all, as Sandemanians" and viewed his membership as more important than his career in science. For his admission to the church, Faraday would have been required to demonstrate before the assembled congregation his faith in the saving grace of God and his commitment to live in imitation of Jesus Christ. Sunday morning and Wednesday evening he would leave the Royal Institution and travel to the meeting house. His normal practice of the elder's duties would include most obviously his participation in the Sabbath services, including the exhortations that he was expected to deliver. He performed numerous pastoral duties among the London brethren, such as visiting those in need and tending to them, both materially and spiritually. (Cantor)

These founding fathers who were Christians represent various disciplines. Blaise Pascal (1623-1662) was a brilliant mathematician who became a devout Christian at age 31. He carried with him all his life a description of that experience. In his *Pensées* he has some valuable insights into the relation between science and religion. Robert Boyle (1627-1691) was founder of the Royal Society in London and is sometimes called the father of modern chemistry. His scruples in matters of religion prevented him from taking the oaths required of a president of the Royal Society, which he thus declined. In his will he left an endowment to provide sufficient income for an annual lectureship to combat the atheism widely professed by wits in taverns and coffeehouses. Louis Pasteur (1822-1895) made advances in biology and demonstrated that spontaneous generation did not occur. He could not understand those who affirmed that matter had organized itself and were not moved by the Infinite Power who created the worlds. William Buckland (1784-1856), a professor of geology at Oxford, was known for his systematic study of Great Britain's geologic structure, and twice served as president of the Geological Society. He was a committed Christian and Anglican clergyman and wrote a two-volume treatise entitled, *Geology and Mineralogy Considered With Reference to Natural Theology*.

Several other of the founding fathers of science were clergy. Nicolas Copernicus (1473-1543) was an astronomer and canon (staff clergyman) in Poland. He regarded his research as "a loving duty to seek the truth in all things, in so far as God has granted". Nicolaus Steno (1638-1686) developed principles for describing sedimentary rocks that are still in use today. In his later life he turned from science to theology and was ordained a Catholic priest. He took the vow of voluntary poverty, gave all his possessions to the poor, and finally died from an ordeal of poverty and fasting. Gregor Mendel (1822-1884), an Austrian monk, did experiments on garden peas to study patterns of inheritance.

Some ideas for the basic scientific principles were take from Scripture. Lord Kelvin's (1824-1907) second law of thermodynamics, that the dissipation of energy is a universal feature, was based on two of his deepest commitments: universal natural law is created and governed by divine power, and the world is progressively developing toward an inevitable end. He summarized his belief by quoting Psalm 102:26, "all of them shall wax old like a garment". Carolus Linnaeus (1707-1778) is considered the father of taxonomy and instituted the binomial (two word) nomenclature still used today to define genera and species. The Linnaean system was inspired by his search for the distinct "kinds" of created organisms mentioned in Genesis. James Clerk Maxwell (1831-1879) proceeded from the contemplation of material relationships to spiritual truth, as he did from the model of the electro-magnetic field to the equations. After his religious conversion at age 22, he was sure that the basis of religion did not lie in rationalist elaborations. Johannes Kepler (1571-1630) found that the doctrine of the Trinity suggested the three part heliocentric system of the sun, the fixed stars, and the space between them.

Present-day scientists who are believers

Although not often realized, there are many present day scientists who are also believers. *The Skeptical Inquirer* may be an unlikely place to find some examples, but several are mentioned by Tom McIver, an anthropologist at UCLA. Wernher von Braun was a chief rocket engineer for the German V-2 program in World War II. In the 1960s he was director of the Marshall Space Flight Center and an administrator for planning at NASA headquarters until 1972. He wrote a forward to the 1971 Pacific Press book, *Creation: Nature's Designs and Designer* in which he says:

> Manned space flight is an amazing achievement, but it has opened for mankind thus far only a tiny door for viewing the awesome reaches of space. An outlook through this peephole at the vast mysteries of the universe should only confirm our belief in the certainty of its Creator.

McIver mentions Frank Borman's reply to a Soviet cosmonaut about not seeing God in space: "I did not see Him either, but I saw his evidence." James Irwin formed the evangelical High Flight Foundation the year after he walked on the moon and nearly lost his life on Mt. Ararat leading a High Flight expedition searching for Noah's Ark. When Irwin was asked what he would have said were he able to dialogue with God while on the moon, he answered: "I would have said, 'Lord, is it all right if we come to visit this place?'" And how did he think God would answer? "'It's all right as long as you give Me the honor.'" (Kossick)

John Polkinghorne, a former mathematical physics professor at Cambridge University and Fellow of the Royal Society, began to train for the Anglican priesthood in 1979. In his book, *One World: The Interaction of Science and Theology*, he says:

> The rational order that science discerns is so beautiful and striking that it is natural to ask why it should be so. It could only find an explanation in a cause itself essentially rational. This would be provided by the Reason of the Creator ... we know the world also to contain beauty, moral obligation and religious experience. These also find their ground in the Creator—in his joy, his will and his presence. (p.79)

Sixty leading scientists, including 24 Nobel prizewinners, answered questions about science and God in a recent book entitled, *Cosmos, Bios, Theos: Scientists Reflect on Science, God, and the Origins of the Universe, Life, and Homo Sapiens*. Arthur L. Schawlow is a Professor of Physics at Stanford University and shared the 1981 Physics Nobel Prize with Bloembergen and Siegbahn for their contribution to the development of laser spectroscopy. Schawlow says:

> It seems to me that when confronted with the marvels of life and the universe, one must ask why and not just how. The only possible answers are religious. . . . I find a need for God in the universe and in my own life. (p.105)

Walter L. Bradley served as head of the department of mechanical engineering for 4 years at Texas A&M, and is now a professor and Senior Research Fellow. He has received over US$3,000,000 in research grants and contracts resulting in the publication of more than 80 technical articles. In the spring of 1987 while on business at Cornell University, he agreed to give a Campus Crusade for Christ presentation, entitled "Scientific Evidence for the Existence of God". He says, "As I gave my presentation with eagerness that evening, I knew God was doing something special in and through my life." Over 500 students and faculty attended and a lively discussion lasted past midnight. Since then, similar lectures have been greeted with an overwhelmingly positive response at many of the major US universities. (Bradley)

Henry Schaefer is the director of the Center for Computational Quantum Chemistry at the University of Georgia. He is a five-time nominee for the Nobel Prize and was recently cited as the third most quoted chemist in the world. In a *U.S. News & World Report* article on creation, he is quoted as saying, "The significance and joy in my science comes in those occasional moments of discovering something new and saying to myself, 'So that's how God did it.' My goal is to understand a little corner of God's plan." After evaluating the cosmological evidence, Schaefer comes to the conclusion that a Creator must exist; he must have awesome power and wisdom; and He must be loving and just. Each of us falls hopelessly short of the Creator's standard, but He has made a way to rescue us if we trust our lives to Jesus Christ. (Schaefer)

EVIDENCE FROM SCIENCE THAT IT HAS LIMITATIONS

Naturalistic science is impressive

Science and technology affect almost every aspect of our lives. Our houses, our furniture, and our appliances for heating, refrigeration, and washing are designed using scientifically tested materials and technological innovations. Our food has been grown using fertilizers and pesticides, prepared with additives and preservatives, packaged in plastic and often frozen, and heated by microwave ovens. Our communication using photocopy machines, telephone, radio, television, fax, electronic mail, and the World Wide Web, is (usually) fast and efficient. Transportation by automobile or airplane is rapid and made safer by radar. We have put men on the moon. Computers do much of our bookkeeping and word processing and are becoming ubiquitous and indispensable. Our entertainment comes from CD players, VCRs, and high-tech amusement parks. Even our health and length of life have been dramatically improved by medical science discoveries, such as penicillin, the polio vaccine, laser beams, and contact lenses. And then there are such simple things as ballpoint pens and drip-dry clothes.

In my own experience, I have often been impressed by the wonders of science—from the feeling of awe while working at various particle accelerators to the wonder of cancer therapy using the proton beam at the Loma Linda University Medical Center.

Because of the high pay-off from using the scientific method, both government and private industry are willing to invest millions of dollars in scientific research, such as developing new pharmaceuticals, oil exploration techniques, high energy "atom smashers", space travel, and mapping the human genome. Scientific study displays the elegance, logic, and self-consistency of the natural world. The lure of probing the secrets of nature and developing them for the benefit of humanity surmounts political barriers and provides a brotherhood of science. It is no wonder that some believe the scientific method can be used to solve all our problems. But no matter how impressive scientific achievements are, science has limitations. The scientific method can only be directed to where it is most productive when these limitations are recognized.

The wave model of light as an example of a scientific revolution

The inductive nature of science presents intrinsic limitations. These can be illustrated by the history of a scientific model, such as the physics' model of light.

Almost all the observed phenomena of light, electricity, and magnetism were described a century ago by James Clerk Maxwell using a set of four equations. His wave model of electromagnetic radiation was comprehensive, unifying, elegant, and logical. Considering all the phenomena that the wave model of light could explain, it obviously seemed much better than the obsolete particle model of light suggested by Newton. In the late 19th century, scientists believed that the wave model of light was complete, and in need of no more than minor modifications. This reflected a general attitude in science at the time, as expressed in 1894 by Albert Michelson at the University of Chicago:

> While it is never safe to affirm that the future of Physical Science has no marvels in store even more astonishing than those of the past, it seems probable that most of the grand underlying principles have been firmly established and that further advances are to be sought chiefly in the rigorous application of these principles to all the phenomena which come under our notice. (Badash)

Several pieces of data, however, had not yet been explained. Attempts to deal with these remaining problems led to two major revolutions.

Relativity. The first difficulty had to do with the medium in which light travels. Light waves travel through space where there doesn't seem to be any medium, so an all-pervading substance called aether was postulated. Many experiments were performed to detect it, but no evidence was found. Extrapolating from water waves to light waves resulted in an approximate model that worked well in explaining many phenomena, but not in predicting a medium for light. Albert Einstein solved the problem in about 1905 by simply assuming that light waves cannot be exactly modeled after other waves. In his special theory of relativity, he postulated that light waves travel independently of any medium (or reference frame).

This special theory of relativity made the very non-intuitive prediction that while observing an object moving at high speeds close to that of light, the mass of the object would appear to increase, its length would appear to shorten, and its time would appear to move more slowly. This prediction has been experimentally confirmed, and the equations of special relativity are now routinely used to describe experiments at particle accelerators. Observations at "every-day" speeds cannot be used to understand what happens at the extremely high speeds at which light travels.

Quantum Mechanics. The second difficulty had to do with whether light is actually a wave. Newton's particle model had long since been superseded by the wave model, but there were some observations, such as the ultraviolet catastrophe, that could not be explained by treating light as a wave. Overtones, sound waves with frequencies higher than the fundamental, are produced from a single vibrating piano string. However, light waves from red hot iron include very little high frequency ultraviolet. The explanation for this discrepancy came in 1900 when Max Planck modeled light in terms of particles of energy, with higher frequency light having more energy per particle. High frequency ultraviolet light would require too much energy per particle to be readily produced.

The model of light as a particle or quantum of energy was part of the development of quantum mechanics that has made some very non-intuitive predictions about the physical world at small sizes. For example, particles such as electrons must sometimes be treated as waves, thus making it impossible to know exactly where they are located, and electrons in an atom can only orbit in certain discrete shells. These predictions have since been verified. Now quantum mechanics is used to understand chemical bonding, the electron microscope, the laser, the transistor, nuclear power, and radioactivity, but in so doing it has incorporated some of Newton's particle model of 200 years before. Today we find that light is treated as a wave under certain conditions and as a particle under others. A simple understanding of water waves cannot be extrapolated to the extreme of small size.

Some limitations of science demonstrated by the new physics

From studying these two revolutions in the model of light, several limitations of science become apparent, even if the possibility of supernatural intervention is ignored. Even in the natural world, much data is unavailable. Even for some of the available data, explanations are lacking. Even for good explanations, simplified approximations (models) are used. Even though one model is used, other models are possible.

In addition to relativity and quantum mechanics, developments in astrophysics, complexity (chaos) theory, and artificial intelligence (and its relation to the conscious mind) make up the new physics that suggests some other limitations of science.

Intuition is insufficient. Our understanding of extreme conditions is limited by human experience. Models explain the unknown using the known, but reality is more than the scientific model. The 6 blind men and the elephant are a good example of this limitation. At the high speeds and energies described by special relativity mass increases. In the strong gravitational fields described by general relativity light bends and time slows, suggesting the possibility of time travel and of being outside of space and time.

Determinism is incomplete. Under some situations described by the new physics, cause and effect relations break down. Nature was once understood to be totally deterministic. Newton's laws of gravitation were used to predict the return of Halley's comet in 1757 after it was observed in 1682. The planet Neptune was discovered where it was predicted based on irregularities in the orbit of Uranus. Laplace went so far as to suggest that the future behavior of the universe was absolutely predictable in principle, if the present positions and forces on all particles were known.

However, the Heisenberg uncertainty principle of quantum mechanics states that the exact position and speed of any particle can't both be known exactly at the same time. This type of uncertainty has led to the realization that, although the general properties of radioactivity can be described, no specific cause can be given for the decay of any individual atom.

Complexity theory has found that there are many situations that are far too complex for every effect to be traced to its cause:

> "...all the general features attributed to classical mechanics are in general wrong. The exactly soluble examples are not generic; they are in fact quite atypical." "... chaotic behavior, contrary to earlier beliefs, was a rather general property and not a pathological feature of some contrived system" (Dresden)

Complexity is due to slight variations in initial conditions. The idea that imprecise initial conditions, can totally change final results is illustrated by the following scenario:

For the want of a nail, the shoe was lost;
For the want of a shoe, the horse was lost;
For the want of a horse, the rider was lost;
For the want of a rider, the battle was lost;
For the want of a battle, the kingdom was lost!

A practical example from meteorology is known as the "Butterfly Effect":

It's 10:15 in the Amazon, and a butterfly flaps its wings,
Which creates a subtle breeze that spreads pollen throughout the air,
Causing a caribou to sneeze and send its massive herd into a stampede,
Which adds wind and dust to a mounting storm that then becomes a hurricane,
Which alters the global pattern of weather.

Objectivity is incomplete. The observer affects what is observed. Science assumes an unbiased observer of an objective reality, but occasionally that's not true. An often seen example of the lack of objectivity is the dual picture of the young lady and the old granny.

Quantum mechanics finds that light as well as electrons are both a wave and a particle until observed. What is seen depends on the experiment—you see what you are looking for. Radioactive atoms are both undecayed and decayed until observed, which led to the famous Schrödinger's cat paradox. Einstein didn't like these results of quantum mechanics and emphasized the problems with this view, but quantum mechanics seems to be right and Einstein wrong. Quantum mechanics is not about what is, but about what happens when we observe.

Objectivity is lacking in the area of astrophysics because there is only one universe to observe, and we are part of what we are observing. Objectivity is also lacking because of our own conscious mind as observers. The physical world is not a closed system, because the non-physical, free will of the conscious mind can alter it. The evidence for this conscious mind is personal, because it is a private domain, closed to science.

Reductionism is insufficient. The whole is more than the sum of the parts. Nature appears to have hierarchical levels with emergent properties, just as a novel requires a combination of alphabet letters, but is more than just spelling and grammar, and computer programs requires hardware, but are more than just computer chips and hard drives.

In the same way the conscious mind can't be reduced to just cellular interactions or computer artificial intelligence. Consciousness requires life, but is more than life; it requires matter, but is more than matter and the physical/chemical laws that govern it. The conscious mind has unique (non-reducible) features such as feelings (love, hate, beauty, humor, pain, pleasure, and envy), skills (language, foresight, music), wholistic perceptions (such as recognizing flaws in a picture), and a recognition of truthful statements. Gödel demonstrated in his Incompleteness Theorem in 1931 that there are obviously true statements that can't be proved. Conversely, there are paradoxical statements that are neither true nor false:

"One of themselves [Epimenides], ... said, 'Cretans are always liars'" (Titus 1:12)

or,

The following sentence is not true.
The previous sentences is true.

The paradox results from self-reference that can really only be appreciated by the conscious mind.

There was a beginning. It was hoped that science could explain everything, but there is a past limit, an effect without a cause. The Big Bang was resisted philosophically for this very reason.

The universe appears designed. It appears fine tuned for life, with too many coincidences to explain. Life and humans are more than the natural result of physical law. In quantum mechanics, the ratio between the strong force (that holds the protons in the nucleus together) and the electromagnetic force (that would cause them to fly apart) is finely tuned. If the strong force were larger, the protons would more readily clump together forming only the heavier elements, with no hydrogen for water and life. If the strong force were smaller, the protons would less readily clump together forming no heavier elements, and thus no carbon or oxygen that is necessary for life.

In astrophysics, the mass of the universe, the cosmological constant, and the neutron/proton mass ratio also appear to be finally tuned. Science attempts to explain this evidence for design by using the Anthropic Principle:

We wouldn't be here, if the universe weren't fine tuned as it is. This explanation may be convenient, but it isn't science.

Unprecedented devastation and pollution are possible. Science often improves life, but science without morals can be destructive. Numerous examples can be given from nuclear bombs to Chernobyl's radioactive fallout. J. Robert Oppenheimer, in talking about the atomic bomb said:

> In some sort of crude sense which no vulgarity, no humor, no overstatement can quite extinguish, the physicists have known sin; and this is a knowledge which they cannot lose. (Thorne, p.223)

A negative response from the standard scientific viewpoint

The standard scientific opinion is expressed well by Steven Weinberg in his book *Dreams of a Final Theory*. Chapter 3 gives "two cheers for reductionism", argues that there are no fundamentally new laws for complex systems, and decries holism as the "nuttiest extreme". Chapter 4 finds no "messages for human life in quantum mechanics that are different in any important way from those of Newtonian physics". Probabilistic interpretations do not do away with determinism or make room for human free will and divine intervention. Chapter 9 mentions that the constants of nature presently appear to be well suited for the existence of life, but Weinberg believes that a final theory would be able to prescribe values for all these constants of nature without any surprising coincidences, although he recognizes that a cosmological constant of exactly zero to 120 decimal places may still require some kind of anthropic principle for explanation. Finally, he says "it is consciousness that presents us with the greatest difficulty", but even there it "is not unreasonable to hope that ... we shall be able to recognize something, some physical system for processing information, that corresponds to our experience of consciousness".

Chapter 7 finds no use for philosophy in arriving at physical principles, and chapter 11, entitled "What About God?", finds no place for theology either. Weinberg says that "the only way that any sort of science can proceed is to assume that there is no divine intervention". As such "there is an incompatibility between the naturalistic theory of evolution and religion as generally understood". The incompatibility is not one of logic, but of temperament. Religion didn't arise to answer questions about first causes, "but in the hearts of those who longed for the continual intervention of an interested God". If no conflict is seen, "the retreat of religion from the ground occupied by science is nearly complete". To try to resolve the conflict by having science treat factual reality, while religion treats human morality doesn't work. Religion as defined by the great majority of believers definitely has something to do with factual reality.

Weinberg would like to believe in a designer, but that designer would also have to be responsible for suffering and evil. He would like to find evidence in nature of a concerned creator, but finds "sadness in doubting that we will". He does not think "that science will ever provide the consolations that have been offered by religion in facing death". Religion provides meaning and hope, but for those very reasons it seems "indelibly marked with the stamp of wishful thinking". To respond, science has done well at mechanistically explaining the natural world, but it has left humanity with a clock-work universe that provides nothing for the human spirit. A purpose in life requires the personal touch. Weinberg feels that personal need, but unfortunately does not see the solution in religion.

Weinberg finds fundamentalists and other religious conservatives in one sense closer in spirit to scientists than religious liberals. Conservatives believe in what they believe because they think it is objectively true, whereas liberals "think that different people can believe in different mutually exclusive things without any of them being wrong". However, "it is conservative dogmatic religion that does the harm" with "the long cruel story of crusade and jihad and inquisition and pogrom." Weinberg would like to strike a balance between the contributions of religion and its problems, but in so doing "it is not safe to assume that religious persecution and holy wars are perversions of true religion".

These comments should be of concern for any group that feels it has a corner on truth, whether scientific or religious. Even objective truth can be viewed from many different perspectives with each individual attaching different relative significance to different aspects. Thus the fact of objective truth gives no license for one group to force their perception of that truth on others. Weinberg does a good job of making a case for the beauty and power of naturalistic science. Unfortunately, he pictures a totally naturalist theory with no place for God.

A positive response that the naturalistic world view is not sufficient

Paul Davies in *The Mind of God: The Scientific Basis for a Rational World* says:

> ... There is no doubt that many scientists are opposed temperamentally to any form of metaphysical, let alone mystical arguments. They are scornful of the notion that there might exist a God, or even an impersonal creative principle or ground of being that would underpin reality and render its contingent aspects less starkly arbitrary. Personally I do not share their scorn. Although many metaphysical and theistic theories seem contrived or childish, they are not obviously more absurd than the belief that the universe exists, and exists in the form it does, reasonlessly. It seems at least worth trying to construct a metaphysical theory that reduces some of the arbitrariness of the world. But in the end a rational explanation for the world in the sense of a closed and complete system of logical truths is almost certainly impossible. (p.231)

John Polkinghorne, a mathematical physics professor at Cambridge University and Fellow of the Royal Society, also trained for the Anglican priesthood. In his book, *One World: The Interaction of Science and Theology* he says:

> The rational order that science discerns is so beautiful and striking that it is natural to ask why it should be so. It could only find an explanation in a cause itself essentially rational. This would be provided by the Reason of the Creator ... we know the world also to contain beauty, moral obligation and religious experience. These also find their ground in the Creator—in his joy, his will and his presence. (p.79)

The observations that a totally naturalistic science is insufficient can lead to various metaphysical philosophies such as the New Age, eastern mysticism, Hare Krishna, and theosophy; but they also make Christianity a viable option. The new physics in no way negates the many virtues of science, but it partially undermines science as a stand-alone world view with securely independent foundations of its own.

EVIDENCE FROM INSPIRATION THAT NATURE IS GOOD, BUT IT IS NOT GOD

What should be the correct relation between science and religion? between nature and revelation? Should it be one of conflict as so many find, or should it be one of cooperation that others see? Both views are in the inspired writings.

Cooperation is seen, for example, in Psalm 19:1, "The heavens declare the glory of God; and the firmament showeth his handywork." Romans 1:20 states that, "The invisible things of [God] since the creation of the world are clearly seen being perceived through the things that are made, even His everlasting power and divinity." And Paul seems to approve of the scientific method in I Thessalonians 5:21, where he says "Prove all things; hold fast that which is good." The *Ministry of Healing* states that,

> "Nature testifies that One infinite in power, great in goodness, mercy, and love, created the earth, and filled it with life and gladness." (MH 411)

On the other hand, conflict is definitely found in the inspired writings as well. Some aspects of nature were not to be part of the worship of Israel because of the association with heathen worship. Through Moses, God said, "Thou shalt not plant thee a grove of any trees near unto the altar of the Lord thy God" (Deut 16:21). In I Timothy 6:20,21, Paul warns Timothy to avoid "oppositions of science, falsely so called." *The Great Controversy* says that

> "To many, scientific research has become a curse. God has permitted a flood of light to be poured upon the world in discoveries in science and art; but even the greatest minds, if not guided by the word of God in their research, become bewildered in their attempts to investigate the relations of science and revelation." (GC 522)

Reasons for either cooperation or conflict

Cooperation occurs as long as God remains supreme, that is, as long as the Creator is worshipped. The conflict only comes when God is no longer given His rightful position, and when the creature takes the place of the Creator.

There is cooperation: (1) when nature—that is the creation—points to the Creator, (2) when the complexities of nature are seen as manifesting God's infinite wisdom, (3) when the inter-relationships of nature are seen to demonstrate God's love and personal concern for man's welfare, (4) when God's good handiwork leads to appreciating the beauty of His character, (5) when the law and order in nature lead to understanding God's government, and (6) when the resources of nature are used with good stewardship to bring glory to God. There is cooperation between science and religion when science studies nature in order to understand the Creator.

On the other hand, there is conflict: (1) when science sees nature as an end in itself, independent of any Creator, Sustainer, or Savior, (2) when man thinks he can figure out all of the complexities of nature himself, (3) when man sees no personal God of love behind the natural world, (4) when the beauties and marvels of nature are appreciated for their own sake with no thought of their source, (5) when the laws of nature are not seen to extend to a moral law governing human behavior as well, and (6) when the natural resources of earth are exploited for selfish ends.

First, and basic to the others: nature points to the Creator, and away from ourselves. Psalm 104 exemplifies this approach. In contrast, Jeremiah shows his distress at Israel who makes idols out of wood and stone: "in the time of their trouble they will say, Arise, and save us. But where are thy gods that thou hast made thee? let them arise, if they can save thee in the time of thy trouble." (Jer 2:27,28)

Second: nature shows God's wisdom, not man's. Much is said about God's wisdom in Job. Chapter 28, for example, states that wisdom is not to be found in nature, but in the fear of the Lord. Near the end of the book God asked Job, "Who is this that darkeneth counsel by words without knowledge? Gird up now thy loins like a man; for I will demand of thee, and answer thou me" (Job 38:2,3). God asked plenty of questions about nature that Job was unable to answer. Finally, Job said, "Behold, I am vile; what shall I answer thee? I will lay mine hand upon my mouth" (Job 40:4).

In contrast to this is Eve, the first scientist. She based her decision on empirical evidence. She put her wisdom before God's. The Bible says, "when the woman saw that the tree was good for food, and that it was pleasant to the eyes, and a tree to be desired to make one wise, she took of the fruit thereof, and did eat." (Gen 3:6)

Third: God is a personal God, not some impersonal natural force. In the Sermon on the Mount, Jesus portrays God as one who takes care of the "fowls of the air" and the "lilies of the field."

> "Therefore take no thought, saying, What shall we eat? or, What shall we drink? or, Wherewithal shall we be clothed? ... for your heavenly Father knoweth that ye have need of all these things. ... [and] all these things shall be added unto you." (Matt 6:25-33)

The book *Education* says,

> "No intangible principle, no impersonal essence or mere abstraction, can satisfy the need and longings of human beings in this life of struggle with sin and sorrow and pain. It is not enough to believe in law and force, in things that have no pity, and never hear the cry for help. ... We need to clasp a hand that is warm, to trust in a heart full of tenderness." (Ed 133)

Fourth: the beauties of nature show the goodness of God and are not themselves to take prominence. At the end of the creation "God saw everything that he had made, and ... it was very good" (Gen 1:31). But the first and second commandments prohibit worshipping nature as god, including "any likeness of any thing that is in heaven above, or that is in the earth beneath, or that is in the water under the earth" (Ex 20:4). And Paul speaks of "the wrath of God" against those "Who changed the truth of God into a lie, and worshipped and served the creature more than the Creator, who is blessed for ever" (Rom 1:18,25).

Fifth: God has instituted a moral law as well as natural law. Nature relentlessly obeys her laws, but man doesn't. "The stork in the heaven knoweth her appointed times; and the turtle and the crane and the swallow observe

the time of their coming; but my people know not the judgment of the Lord" (Jer 8:7). Romans 1 outlines the lack of moral law for those who worship the creature more than the Creator.

Sixth: Man is a steward of God's world. Natural resources are not man's to plunder. God says, "every beast of the forest is mine, and the cattle upon a thousand hills. ..." (Ps 50:10,11) In the creation, God said to Adam and Eve, "Be fruitful, and multiply, and replenish the earth, and subdue it: and have dominion over the fish of the sea, and over the fowl of the air, and over every living thing that moveth upon the earth" (Gen 1:28).

Old Testament stories of conflict

Stories in Scripture serve as warnings of the failure that comes from putting the creature above the Creator. This worship of nature was an integral part of the religion of the pagans that surrounded the Jews in the Near East.

The ten plagues on Egypt were specifically directed against the nature gods. The plague of hail destroyed the sacred objects of worship, the cattle and sheep. The plague of locusts revealed a God in control of the animals. The plague of darkness showed the weakness of the sun god Ra. The turning of water to blood was directed against Osiris, the god of the Nile, whose yearly flooding brought soil, fertility, and wealth to Egypt. The Nile god appeared to have within itself the power of rejuvenation, regeneration, and resurrection.

The Canaanites often worshipped their nature gods in beautiful natural settings. Before the Israelites entered Canaan, God instructed them to "utterly destroy all the places, wherein the nations which ye shall possess served their gods, upon the high mountains, and upon the hills, and under every green tree" (Deut 12:2). Before Gideon attacked the Midianites, he cut down the groves where his own people worshipped Baal. (Judges 6:25) Solomon married wives from the surrounding nations and built high places for them on the hills of Jerusalem. (I Kings 11:5,7) Because of Solomon's apostasy, 10 of the tribes rebelled under Jeroboam, but he also made "groves on every high hill" (I Kings 14:23).

During the reign of Ahab and Jezebel, the kingdom of Israel worshipped Baal. Yearly rituals between Baal the weather god, and Anat the goddess of love and war, involved temple prostitutes and ensured the next season's fertility. The three and a half years of famine foretold by Elijah and the futile incantations of the priests and prophets of Baal on Mt. Carmel showed the impotence of this storm god. The lightning and later rain in answer to Elijah's prayer made obvious to the Israelites that instead Yahweh was in control of nature. (I Kings 18)

The nature gods were not like Yahweh: they were not personal gods; they would only bring blessings when given sacrifices; they were only interested in the rituals, not the affairs of normal life; and they did not demand exclusive worship. The worship of these nature gods was never eradicated, so that the Israelites were still building the high places of Baal in Jeremiah's time, and God allowed them to be taken into captivity to Babylon (Jer 19:5-9).

Last day examples of conflict

The tendency remains today to worship the creature, instead of the Creator. Nature is a good gift from God, and science can appropriately be used as a tool for its study, but when the creation takes priority over the Creator, it is false worship. The difference between worshipping the Creator and the creation can be very subtle for Satan will even make "fire come down from heaven on the earth in the sight of men" as Elijah did (Rev 13:13). However, the 7 last plagues, similar to the plagues of Egypt, show that nature is ultimately under God's control, not man's.

The three angel's messages (Rev 14:6-12) contrast the worship of the Creator and the worship of the creature (the creation). The first angel calls all to "worship him that made heaven, and earth, and the sea, and the fountains of waters". The third angel warns against worshipping the creature, for "If any man worship the beast and his image, ... The same shall drink of the wine of the wrath of God".

The first angel reminds that there is more than natural law—there is also a moral law that should cause all to "Fear God, and give glory to him; for the hour of his judgment is come". To prepare for the judgment, the first angel has "the everlasting gospel to preach unto them that dwell on the earth". It points beyond salvation by personal effort to the One who can re-create. The system of salvation by works has fallen. Great Babylon, and before it the tower of Babel, were symbols to man's ingenuity and wisdom, his probing the secrets of nature, and his attempts

to save himself. Nebuchadnezzar said, "Is not this great Babylon, that I have built for the house of the kingdom by the might of my power, and for the honour of my majesty" (Dan 4:30).

The symbol of those who worship the creature, or beast, is the mark. Nothing in creation is more important to life on earth than the sun. The Egyptians realized that and worshipped the sun. The Roman empire did the same and set up their own day of worship. In contrast, the symbol of those who worship the Creator is found in the fourth commandment, "For in six days the Lord made heaven and earth, the sea, and all that in them is, and rested the seventh day: wherefore the Lord blessed the sabbath day, and hallowed it" (Ex 20:11). The Sabbath as a symbol or ritual is meaningless in itself, but it points to the essence of the Bible message.

CONCLUSION

A Christian believes that reality consists of more than science can address. The miracles recorded in the Bible, especially the incarnation and resurrection of Jesus Christ (the heart of Christianity), cannot be studied by the scientific method. These supernatural events are not presently occurring and thus are not observable, repeatable, reproducible events. In addition, science provides no absolute standard for answering moral and ethical questions, and science has difficulty providing purpose and meaning to life since it cannot conquer death.

It is true that reason and evidence are important for faith (Isa 1:18; I Thess 5:21) and God provides evidence that appeals to the reason—the miracle of life, fulfilled prophecy, changed lives, moral instincts. Likewise, God sustains His creation by natural laws that require reason to understand. However, human reason has its limits; God is too big for us to ever fully comprehend (I Cor 1:19-29). Room for doubt will never totally be removed (SC 105-113), because our understanding is finite. Pride would be no hinderance to a belief in God if it were based on human reason alone (DA 455), but faith is based on more than just the evidence of the senses (DA 406).

Both faith and reason are needed in a complete world view, and finding a reasonable faith is a continuing process (5T 698-711). It is not a completed conclusion, because only part of the data is available, and we only know a few of the possible interpretations; therefore, tolerance should be extended to others who see things differently. In the process, one expects not to have all the answers and not to have complete harmony. There is no need to fear looking at all the evidence; faith should be able to withstand the most careful scrutiny.

How then should reason be used in relation to faith? It can suggest to the unbeliever that his world view doesn't fit with reality, and to one who is weighing the evidence that science does not need to stand in the way. For the believer, reason and evidence serve to confirm a faith that is already present. However, scientific evidence is not a proof for God or Christianity and our apologetic cannot be to convince by reason alone. In the end, the best argument for faith is not impersonal facts, but the life of the believer.

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