An Adventist View of Science

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West Indies College, Mandeville, Jamaica
Jim Gibson, Geoscience Research Institute

"A Christian, of course, believes that there is more to reality than science can address." (Clausen 1993, p 83)

Modern science has had a great influence on our culture. Its influence has become so pervasive that the scientific viewpoint is often taken for granted as the basis of knowledge. It is often overlooked that science is based on certain presuppositions. It is imperative that Christians recognize the presuppositions of science in order to understand the reasons for the current tension between science and scripture.

What is the definition of "science"?

"For purposes of discussion we can consider it [science] to be a process of finding truth and explanations about nature . . ." (Roth 1993, p 323)

"Holmes (1983) states that science 'is an empirical and theoretical inquiry into natural processes and relationships." (Durrant p 50)

The term "science" has been used with different meanings. This has caused confusion in evaluating the relationship between science and faith. It is imperative that the meaning of science be understood before its relationship to faith can be accurately evaluated.

In its broad definition, "science" is a systematic method of understanding nature. God's activity is not excluded from this kind of science. This meaning of science seems to be intended by Ellen White when she says, "God is the author of science" (Counsels to Parents, Teachers and Students, 1943, p 426). When "science" is used in this manner, it encompasses virtually all of reality. In this context, the term "unscientific" is a derogatory term meaning false or unreasonable. No one wants to be "unscientific" in this sense.

"Science" also has a narrow definition. In the narrow sense, science is a method of proposing and testing hypotheses about the mechanisms by which an event occurs. To state that "God did it" may be true, but it does not identify the mechanism. Therefore, God is deliberately excluded from causal explanations. This exclusion of God can be called "methodological naturalism" (Moreland 1994). Methodological naturalism does not necessarily deny the reality of God's existence, it simply ignores that possibility. In this context, to be "unscientific" merely means not subject to testing. Any statement about God is untestable, and hence "unscientific." For example, consider the two statements: "God exists;" and "God does not exist." Both statements are untestable, and hence unscientific. However, one of them must be true. Christians affirm that "God exists" is a true statement. This is an unscientific position, and all Christians are unscientific in this sense. Since Adventists believe that God is active in nature, it seems

necessary, and even desirable, for an Adventist to have a view of nature that is "unscientific" in the narrow sense.

In discussions among scholars, "science" is ordinarily used in the narrow sense. For this reason, I will use the term in the narrow sense in this paper, unless noted otherwise. "Science" in the narrow sense is a restricted view of nature, and is only a part of "science" (knowledge) in the broad sense.

Experimental science, methodological naturalism, and God's sustaining activity

> *"He [the student] must have firsthand experiences in measuring, in classifying, and in tracing cause/effect relationships."* Taylor p 15

Science incorporates a diverse array of activities and methods. These activities are of varying degrees of reliability, a fact that is well known but little discussed. It will be useful for our purposes to distinguish two types of scientific activity, experimental science and historical science, and to explain some of the differences.

Experimental science is a highly successful type of science. I define experimental science to be the testing of hypotheses in which the initial conditions are sufficiently known and can be reproduced or modified at the will of the scientist. Thus the experiment is repeatable. The high reputation of science is built upon this kind of activity. Experience has shown that if the initial conditions are repeated exactly, the result of an experiment will always be the same (although quantum mechanics casts doubt on this conclusion in certain unusual situations). If the initial conditions are completely specified, only one outcome is possible. Experimental science is successful only because nature is consistent and orderly.

Experimental science has been extremely successful, despite its strongly naturalistic character. Yet Adventists believe the scriptures provide information that is essential to understanding nature. How can science that is virtually atheistic be so successful if nature cannot be understood apart from revelation? I believe the answer lies in how God ordinarily interacts with nature.

God works constantly to sustain the existence and order of the universe in ways that are, to the extent we understand them, highly consistent, regular and predictable. God's consistent manner of upholding the creation is responsible for the observation that only one outcome is possible from a given set of initial conditions. This is what makes the experimental method possible. In other words, the experimentalist in science is attempting to discover the regularities in the way God upholds the universe. God's sustaining activity in nature is so regular and predictable that it cannot ordinarily be distinguished from a natural world governed by its own inherent properties. Thus, the practice of methodological naturalism may not affect conclusions based on the study of God's sustaining activity in nature.

Consider this example. Scientists explain that the planets move in orbits around the sun because the force of gravity prevents them from escaping into space. But what is gravity? Scientists do not have an explanation for gravity; it is simply described as an "inherent property of matter." Gravity is the force that keeps the planets in their orbits. In contrast, Ellen White states:

> *"It is not by an original power inherent in nature that year by year the earth yields its bounties and continues its march around the sun. The hand of infinite power is perpetually at work guiding this planet. It is God's power momentarily exercised that keeps it in position in its rotation."* (White 1948, p 260)

Can these differing viewpoints be harmonized? Perhaps gravity is actually God's perpetually expressed power. Perhaps God has chosen to sustain nature in such a way that a mathematical relationship exists between the masses of two objects, the distance separating them, and the force of attraction that He supplies continuously. If so, the scientist has an incomplete understanding of gravity. Nevertheless, he is satisfied with his explanation because it works. Since God's sustaining activity is consistent, the scientist can successfully pursue his studies. This illustrates how methodological naturalism can be a successful approach for experimental science.

Because God is continuously active in nature, methodologically naturalistic science can never reveal the entire truth about nature. However, ignoring God as ultimate cause will ordinarily not make any practical difference in understanding "how" an event occurs. Christian researchers ordinarily study nature with a methodologically naturalistic approach. In so doing, however, they must keep in mind that they are really studying God's sustaining activity. In a sense, doing science can be likened to playing a game (Ratzsch 1996, p 168), in which one attempts to develop plausible explanations for events while "pretending" that God is not involved. The danger is in forgetting that one is only pretending, and many scientists seem to have forgotten.

Historical science and God's special activity

> *"A miracle could then be seen as God simply doing something a little different than normal"* (Rogers 1994, p 336)

Historical science differs from experimental science in that it attempts to reconstruct an event that was not observed. Since the event has already occurred, the initial conditions are unknown. Even the ending conditions may be only partially known. We previously noted that only one outcome is possible, given a specified set of initial conditions. Is the converse true? Given an outcome, is only one set of initial conditions possible? The practical answer is no. Two or more different sets of initial conditions may produce outcomes that are indistinguishable on the basis of the information available.

Several examples could be presented of different processes producing similar results. Turbidites are one such example. Certain deposits were once interpreted as being slowly

deposited in shallow water. Later, it was discovered that turbidites were deposited rapidly, and, at least in some cases, in deep water. A more recent example involves certain deposits of unsorted rocks, clay, and gravel known as tillites. The evidence strongly indicates that some tillites were produced by glaciers. Because of this, all tillites have been interpreted as deposited by glaciers, and many "ice ages" have been proposed in the fossil record. However, tillites are often associated with fossils of organisms that do not seem to fit in a glacial environment. It has recently been suggested that these tillites were actually produced by extraterrestrial impacts. This point has not been settled yet, but the impact explanation seems to be gaining supporters. These examples illustrate the point that different processes may cause similar effects. Additional data may favor one explanation over another, but sometimes the data are too incomplete to be decisive.

Despite its potential uncertainty, historical science has enjoyed considerable success. Most criminal trials use historical evidence to attempt to reconstruct an event. The results appear to have been generally satisfactory, although with some notable failures. Historical science is possible because most historical events have been governed by God's sustaining activity rather than His special activity. To the extent this statement holds, methodological naturalism may be successful in developing an explanation of an unobserved event.

However, the situation is different if God's special activity was involved in an event. This is because God can accomplish a desired outcome in more than one way. We may be unable to infer the initial conditions in such cases.

What do I mean by "God's special activity?" This term refers to God's infrequent actions such as creation, or reorganization of materials, or initialization of conditions. Such activities are not predictable or subject to the will of an experimenter. This means they are not subject to experiment. Events in which God acts in a special way for a specific purpose can be called supernatural. One way to define a supernatural event is an event that is unpredictable and has a purpose. Supernatural activity violates the naturalistic presuppositions of science; therefore, such events cannot be understood through naturalistic science. They may not be decipherable at all.

Supernatural events and natural law- descriptive and prescriptive

> *"Many scientists would insist that . . . miracles are some sort of magic, contrary to natural law, and thus unscientific. That would be a reasonable assertion only if we are willing to believe that science has discovered all natural laws;"* (Brand 1985, p 78)

I have explained regularities in nature as due to the consistency of God's sustaining activity in nature. These regularities are generally called "natural laws." In my view, natural laws are not inherent properties of matter, but are simply descriptions of God's sustaining activity in nature. Supernatural events are different, in that they involve God's special activity. What is the relationship of natural law to supernatural activity? Does God break natural laws when He acts in special ways? The following discussion will address this question.

Supernatural events may occur in a variety of ways. In some cases, God uses mechanisms that are wholly inaccessible to humans. Creation is one example of this type of supernatural event. We have not observed God in the act of creation. Other examples of creative acts are the raising of Lazarus, the multiplying of the loaves and fishes, the Resurrection of Christ, etc. These events involve mechanisms or "laws" that are beyond our knowledge. Any "methodologically naturalistic" explanation for such an event will certainly be wrong, even if it seems plausible to the one proposing it. The mechanisms for these events may not be understood even through revelation

Some supernatural events may appear inexplicable, yet involve mechanisms that could, in principle, be understood. For example, consider Balaam's talking donkey. If Balaam could have seen the angel, he might have understood what was going on. The angel did not need to "break" any "laws" of nature in order to speak; he could even have moved the donkey's head as he spoke. Yet the event is certainly supernatural. It could not have been predicted and it had a purpose. It would not have happened without the direct intervention of an intelligent being. Other supernatural events that might be understood if we could observe the activities of angels might include the floating axe head, the release of Peter from prison, and the deliverance of Daniel in the lions' den. Even the basis for the appearance and disappearance of angels might be understandable, although no human presently has that knowledge. Methodological naturalism is incapable of providing an explanation for these supernatural events. It is only through revelation that they can be understood.

Sometimes God works through ordinary, visible mechanisms, yet the event can still be regarded as supernatural. An example might be the drying of the "Red Sea" that marked the exodus of the Hebrews from Egypt. A strong wind drove the water aside and dried out the surface underneath, providing a path for the escaping Hebrews. Wind is an ordinary phenomenon, not usually considered to be supernatural. This wind may have appeared to be natural, yet the scriptures reveal that it had a purpose. Furthermore, it was not predictable. This event can be considered a supernatural event, even though the mechanism was observable. Of course, the origin of the wind itself remains unknown, and might not be explainable through ordinary mechanisms. Other examples of supernatural events using observable mechanisms might include the provision of the quails for the Hebrews, the opening of the jail in Philippi by an earthquake, and the stopping of the Jordan River (It has been conjectured that this was accomplished by a landslide.) Such events may appear to be susceptible to a naturalistic explanation, but this conclusion would be incomplete at best and incorrect at worst.

How can supernatural events be identified? Is it possible to know whether an event was supernatural or not merely by observing the results of the event long after the fact? Not necessarily. Scientists may be able to propose a "natural" mechanism that would accomplish the observed result. Yet a supernatural being might be able to accomplish the same result through a variety of action sequences. It may be only through revelation that we can learn that an event was supernatural. Here the scriptures should be our guide. By using the scriptures to guide our study of nature, we may learn that God has acted in special ways in certain events.

Does God break His own laws in a supernatural event? I have pointed out there are at least three ways in which God may accomplish supernatural events. Some supernatural events occur through processes that seem to be beyond our knowledge, and we do not understand how they are accomplished. We suspect there are laws governing this class of supernatural events, although we have no idea what they might be. Other supernatural events occur through the activities of invisible agents such as angels, but without the need for any "unlawful" manipulations of nature. A third class of supernatural events appears to be accomplished through ordinary, familiar processes. Therefore, we are not justified in concluding that God breaks His own laws during supernatural events. We simply do not know all of God's laws.

The terms "descriptive law" and "prescriptive law" have been used to distinguish the laws we know from those we do not know. Descriptive law refers to those observed regularities in nature that are known well enough to be considered reliable. Examples might include the effects of gravitational attraction, the properties of water molecules, the mechanism of genetic inheritance, etc.

In contrast, prescriptive law refers to the sum of God's methods of working in nature, including both ordinary and supernatural events. Prescriptive law is known only to God. We are not able to see any pattern in a class of events unless it is observed repeatedly. Certain types of events may occur only once in our history, or not at all. Only God knows what regularities are involved in such events. There is no need to postulate that prescriptive laws are exceptions to descriptive laws. Rather, descriptive laws may be only special cases of prescriptive laws. To illustrate, consider the "Law of Conservation of Mass," once thought to be immutable. Later, it was discovered that this regularity did not apply in certain extreme situations. The conversion of matter into energy violated this "natural law." As a result, the "law" was expanded. The "law" of conservation of mass is now considered to be only a special case of the "Law of Conservation of Matter and Energy." What once appeared contradictory has been discovered to actually be consistent with a broader law. Even this "law" may be incomplete. In a similar way, supernatural events may be considered to follow regularities that apply in a broader sense than can be determined from the study of God's sustaining activities.

Limitations of science

> *"While we do keep fitting pieces into the puzzle of nature, we recognize that we are only working on a small corner and that the hope of dropping in the last piece is beyond our grasp."* Kootsey 1996, p 10)

Science has been so successful that many people have not thought about what its limitations might be. Yet it is important to be aware of the weaknesses, as well as the strengths, of science. Some of the more important limitations are described here (see also Gibson 1994, p 265).

> *"Since even the scientific method is theory-laden and not purely empirical . . . "* (Lienard 1994, p 245)

Presuppositional limitations. Any system of reason is only as reliable as its presuppositions. Science is based on certain presuppositions, and is reliable only to the extent that its presuppositions are valid. Two important presuppositions of science are that nature is autonomous and comprehendible (Ratzsch 1986, p 20). These presuppositions are the basis for the naturalistic bias of science. If nature is an autonomous, closed system that can, in principle, be understood by humans, then there is no need to consider supernatural involvement. This naturally leads to philosophical naturalism, which holds that there is no supernatural; hence science encompasses all of reality. This is obviously in conflict with the views presented here.

> *"In fact in the book of Job the incomprehensibility of nature is used to direct Job's thoughts to God."* de Berg, p 118

Seventh-day Adventists believe that nature is dependent and only partially comprehendible. First, nature is dependent, not autonomous. God created and rules over nature. Nature is separate from God, but not independent of Him. Nature is ordinarily regular because that is the way God has chosen to maintain it. Second, because God is beyond our comprehension, we are not able, in principle, to understand nature completely. We are able to comprehend much of what we observe in nature, but not all. God may act at will in ways that we do not comprehend. Some events may be beyond our comprehension, even with special revelation. Methodological naturalism may work much of the time, but one should remember that it does not reflect all of reality.

> *"However, science alone cannot assess the complete database because the scientific approach does not consider the possibility of supernatural involvement in nature and in the history of our earth."* (Kennedy 1994, p 310)

Bias in science. Science is often viewed as a purely objective search for the truth about nature. Identifying the presuppositions of science shows that this view is wrong. All scientific interpretations are theory-laden. There is no such thing as a truly objective person. Even the observations of a scientist are theory-laden. Theoretical concerns may determine the kinds of observations that are made and those that are not made. This means that scientific conclusions cannot be accepted at face value, but must be evaluated in the light of other knowledge.

Several sources of bias in science can be identified. Experimental science is highly successful, but even here there is bias in data collection and in interpretation. There may also be bias due to sociological factors, etc. The process of evaluation by the group ("peer review") generally results in the identification of flaws in the conclusions. However, this process may take several lifetimes. Regardless of the length of time an idea has been subject to review, one never knows how many flaws remain. Therefore, all scientific statements should be regarded as somewhat tentative.

Pitfalls in historical science. When the subject of study is historical rather than experimental, the potential for mistakes is much greater. All the pitfalls of experimental science apply to historical science, plus additional problems inherent in attempting to reconstruct the past. These problems include the incompleteness of the available data, the possibility of similar effects resulting from different initial conditions, and the possibility of unrecognized supernatural activity. The true explanation of a historical event may not have been thought of. In the case of a supernatural event, the mechanism may not be (or may be) knowable. The risk of going wrong becomes very high when supernatural activity is involved. Thus conclusions from historical studies especially should be regarded as tentative.

Philosophical naturalism. One may play the "game" of methodological naturalism so long that it no longer seems like a game, but is accepted as reality. When this happens, the line has been crossed into philosophical naturalism, and the possibility of supernatural events is denied. There is no longer any reasonable possibility for supernatural events to be understood. Even methodological naturalism has limits. Where the scriptures identify an event as supernatural, methodological naturalism is both inadequate and inappropriate. Fortunately, such instances are rare; however, they involve some of the most philosophically significant issues in understanding nature.

An Adventist Approach to Science

Adventists should use their reason in their scientific study

> *"Where reason surely comes into its own is in the explanation and application of revealed truths"* (Newport 1991, p 238).

Previously, I pointed out that human reason is incapable of understanding nature without the aid of special revelation. However, this is not to say that human reason is dispensable; it is not. Without reasoning, there can be no understanding at all. Reasoning power and free choice are human characteristics that contribute to our being in the image of God. Reason is a legitimate function of humans, and therefore appropriate in the study of nature. Christians should apply their reason, with the guidance of scripture, to the understanding of nature.

The scriptures indicate the necessary role of reason and questioning (Isaiah 1:18; 1 Peter 3:15; 1 Thessalonians 5:21). It is through reason that we are led to see God's work in nature (Psalm 8:3; Proverbs 6:6; Isaiah 41:20; Matthew 6:28). Ellen White repeatedly emphasized the need to think critically rather than accepting the opinions of others. As Christians, we are obligated to use our reasoning powers.

> *"God has given to every human being a brain. He desires that it shall be used to His glory."* (White 1950, Great Controversy p 522)
>
> *"God is the author of science. Scientific research opens to the mind vast fields of thought and information, enabling us to see God in His created works."* (White 1943, Counsels to Parents, Teachers and Students p 426)

There is no need for Adventist scientists to apologize for using their reason. Each person has the responsibility to develop their reason. The student of nature may expect to find much benefit, both spiritually and materially, from the study of science, guided by revelation,

Adventists should approach the study of science with a Christian commitment

> *"a Christian scholar is a person of integrity . . ."* (Copiz 1991, p 272)

Science is a wonderful enterprise for an Adventist Christian to engage in. She is in a privileged position to see God's handiwork in greater detail than others. But Christians have a higher calling than merely to uncover information. They are called to be witnesses for Christ. In a special sense, Seventh-day Adventists are called to prepare the world for the coming of Christ. The shortness of time and the urgency of the task require that Adventists carefully consider the most effective ways in which to participate in science.

Integrity and responsibility in methods, resources, and relationships

Adventists recognize that there is much good to be derived from learning the secrets of nature. There are many questions to be studied which offer the promise of improving man's health and environment. These questions call for dedicated scientists to help make the world a better place. But there are many questions that are of no significance whatsoever. These questions can be left to those scientists who do not feel a responsibility to improve the lot of humanity, or who do not recognize the shortness of the time remaining to do good on this earth. Adventists will want to see their efforts produce something worthwhile. This is not to say that the only worthwhile science is applied science, and pure science must be left for others. Advances in pure science frequently lead to useful applications. But there are certain areas where scientific research seems not only useless, but wasteful as well. Some may regard the search for extraterrestrial intelligence (SETI) to fit this description. While it is conceivable that some technical spinoff of this research could have practical benefit, there should be more efficient ways to derive that benefit, and more useful activities to engage one's time.

The necessity of honesty in all dealings is axiomatic for Christians. Science makes great demands on the researcher. "Publish or perish" is a long-standing dictum. The pressure to publish is so great that some scientists have fabricated data. This is obviously wrong. It hardly seems necessary to say that Seventh-day Adventist scientists will not permit the pressure to publish to drive them to fabricate data, steal data from others, or claim responsibility for discoveries made by others.

Another temptation for scientists is to support one's position with false arguments. Bad arguments do more harm than good, and should be avoided. This requires one to be aware of his own biases, the limitations of his data, and the arguments used for contrasting positions.

The social aspects of science are also important. Some scientists are arrogant, overbearing, and insensitive to the feelings of others. This is a special temptation to those who receive much praise and deference because of their knowledge or position. Adventists should be aware of this tendency toward human pride and avoid it at all costs. They should also be prepared to deal wisely with those who suffer from the malady of pride.

Scientific research typically requires an enormous commitment of time and resources. The time spent on research may include long hours on evenings and weekends, or considerable time away from home. This will put a burden on the family of the researcher. Family responsibilities should be carefully considered when research is planned. Surely no Adventist would willingly sacrifice his family for a research project, nor even for a career as a scientist.

Adventists should approach science with a recognition of its limitations and a willingness to live with uncertainty

> *"Our problems over the relationship of faith and reason in religion derive partly from the spurious authority which we are prone to confer on science."* (Pearson 1993, p 214)

Seventh-day Adventists regard nature as the work of God, and science as the study of God's works. We believe there should be no tension between "God's word" and "God's world." Nevertheless, there is tension, and our present knowledge of nature does not provide resolution of the tension. We should accept the situation for what it is, and develop some means of dealing with the tension. But first, we should put the problematic issues in perspective.

Science and scripture are generally in agreement.

There are substantial points of agreement between science and scripture. Scientists and theologians agree that nature is both regular in its operation and contingent. ("Contingent" means that nature could have been other than the way it is.) Much of the Bible is a description of historical events, many of which have been independently discovered by archeologists and historians.

The potential for conflict between science and scripture is reduced by the fact that they typically address different kinds of issues. Scripture explains the origins, purpose and meaning of nature, while science attempts to discover and explain regularities in the manner in which nature is governed. Experimental science, and many aspects of historical science, are concerned with God's sustaining activity. The consistency of God's sustaining activity permits scientists to discover much about the way nature is governed. Thus, in most cases, Adventists readily accept the findings of science.

Despite the general agreement of present interpretations of nature and scripture, some tension does exist between the two. Nearly all such tension involves questions of God's special activity in history. When scientists, apart from the Bible, attempt to develop explanations of origins, purpose or meaning in nature they inevitably come in conflict with the scriptures. The resulting disagreements are based on differences in philosophical presuppositions.

Dealing with tension between science and scripture

> *[Students should be able] "to distinguish between evidence and interpretation"* (Woolford 1991, p 311)

Tension between science and scripture focuses on the question of history. Numerous methods have been devised to deal with tension between science and scripture. Some of these are highly unsatisfactory, and should be avoided. Some major categories of dealing with tension will be described.

Avoiding the tension. *Denial by dissociation.* Some thinkers urge that science and religion are not in any basic disagreement because they deal with different issues. The areas which each one addresses are not overlapping, so any disagreement is only apparent. I would call this view "dissociation." According to this view, scripture states "Who" created while science explains "how" He created. Thus the Bible tells us that God is the Creator, while science tells us that evolution is His method of creating.

There are major difficulties with this view. First, the view is based on the premise that the Bible does not address the "how" of creation. This view is not supported by the scriptures. Genesis 1 describes God's activity as speaking the world into existence. This is corroborated by Psalm 33:6,9. The time frame of six days (Genesis 1; Exodus 20:8) hardly leaves any other option. Although the exact mechanism by which God caused the world to appear from nothing (Hebrews 11:3) is not described in Scripture, sufficient description is given to constrain the "how" of creation.

A second problem with this position is that it presupposes that, at least in principle, science is capable of explaining how God created. The futility of scientific investigation of supernatural singularities in creation can be inferred from Hebrews 11:3, where we are told the earth was made from nothing. According to the text, we know this by faith; in other words, there is no direct empirical evidence to demonstrate the point. Other texts state clearly that God's ways are beyond our understanding (e.g., Romans 11:33). A better way of reducing the tension between science and scripture would be to acknowledge that the "how" of creation is not a scientific question. Discussions of such topics should be guided by the scriptures. For further discussion of problems with theistic evolution see Gibson (1992) or Terreros (1996).

Compartmentalization. Compartmentalization is another method of avoiding the tension between science and scripture. By "compartmentalization" I mean that both are held to be true,

although contradictory. This is clearly an unsatisfactory position that would seem to actually increase one's level of tension.

Exclusivity. Tension between science and scripture may also be avoided by denying one or the other. I call this technique "exclusivity." Some may choose to accept only the scriptures and ignore science. Others may choose to accept only science and ignore the scriptures. This is an unsatisfactory way to avoid tension because it leaves the matter not only unresolved, but also unaddressed.

Living with the tension. Accepting the reality of the tension between science and scripture seems a more satisfactory way of dealing with the issue. Some way can then be sought for reducing the tension, or even resolving it.

> *"To them at least [SDA biology or geology teachers] a partial reconstruction of their discipline is necessary."* Sauvagnat p 227

Seventh-day Adventists hold that the disagreement between nature and scripture is artificial; the two would agree if we understood them completely. However, we cannot properly understand nature apart from revelation, because God has intervened in nature in singular ways. This implies that the naturalistic presuppositions of science are invalid. An important purpose of studying science, then, is to find the resolution that must exist, since there can be only one reality. The appropriate way to reduce the tension is to use the information in scripture to guide our efforts in understanding nature. In turn, we may use information from nature to help in understanding scripture. Despite our efforts, we probably cannot expect tension to be completely eliminated.

How should an Adventist respond when science and scripture appear in conflict? The place to start is to re-investigate the matter. What is the basis for one's beliefs? It is not enough to quote cliches that one has always accepted; an authoritative reference is needed. Here is a personal example. Several years ago, I was preparing a talk on changes in species. I was looking for the text that states that animals were to reproduce "after their kind." This phrase forms the basis for reference to "Genesis kinds" as the originally created species that are ancestral to all living species. I knew the Bible taught that animals were to reproduce "after their kind," because I had heard it quoted dozens of times, and had read the expression myself many times. However, when I searched for the text, I could not find it, not even with a Bible concordance. I finally realized there is no such text. The Bible does not teach that species could reproduce only "after their kind." The phrase was being used with respect to creation, not to reproduction. What Genesis was actually saying is that God created many kinds of animals. It still means that God created the animals, but it does not mean that the animals could not change.

Here is another example. There is a series of layers of fossilized trees in Yellowstone National Park. According to scientists who had studied these trees, they represented a series of forests that successively grew and were destroyed, one above the other. The total period of time required for this sequence was estimated as on the order of 100,000 years. The evidence was

so strong that some Adventists declared there was no possible way to explain it in a short chronology. This produced some tension in several Adventist scientists. From their study of the scriptures, they were convinced that 100,000 years was too long. There must be some other explanation. As a result, they went to Yellowstone and studied the fossil "forests" for themselves (e.g., Coffin 1979). As the result of their studies, they discovered that the previous interpretations were wrong. A great deal of field evidence indicated a catastrophic burial of the trees, many of them in upright positions as though growing in place. Re-examination of the data led to an interpretation that is consistent with the biblical description of earth history.

A third example will illustrate a different outcome. For many years, scientists have reported that fossil layers can be arranged in a sequence from bottom to top. This sequence correlates well, in general, with radiometric dates; lower layers give older radiometric dates than do upper layers. This pattern is consistent with a gradual accumulation of fossils and sediments over billions of years. Adventist scholars have investigated this problem. They have reinvestigated the scriptures, as well as the data of the radiometric dates. They have not been able to come up with a resolution of this problem. The two interpretations simply do not agree. At this time, we have no satisfactory explanation. One proposal is that the empty earth existed for a long time before creation week. Therefore, the minerals in the rocks may be very old. During the flood, fossils were covered by these very old rocks, producing the effects we see today. A second proposal is that God created the world with the appearance of age. In other words, when God created the world, it already looked very old, even though it was young. Both of these proposals are consistent with scripture, but neither one explains all the data. Another proposal is that there was life on earth before the creation described in Genesis. The fossil record is simply a record of what happened before the story in Genesis. Others have proposed that this example shows the Bible cannot be trusted in areas of science. These latter two proposals are not consistent with scripture. If one demands an answer, regardless of whether it agrees with scripture, one can choose one of these proposals. I have chosen to leave this question unanswered, and simply accept the scriptural view that God created the world in six days some thousands of years ago.

This method of resolving the tension between science and scripture will be rejected by most scientists and theologians. It is not easy to spend one's career in dependence on human reason, experiencing the success and prestige that is conferred on the intellectually elite, and at the same time confess the weakness of human reason and the superiority of scripture. Refusal to yield authority to the scriptures is one of the characteristic signs of our age (2 Peter 3:3-5).

> *"The most difficult and humiliating lesson that man has to learn is his own inefficiency in depending upon human wisdom, and the sure failure of his efforts to read nature correctly."* (White 1948, Testimonies 8:257)

We exist in a culture heavily influenced by scientism, the belief that science is all there is to reality. Tension is to be expected, not denied or even avoided. We cannot expect harmony between one belief system built upon naturalism and a second system built upon supernaturalism. Tension is inevitable. We cannot possibly maintain faith while at the same time accepting

nothing that cannot be demonstrated. The question is not, "Must we deal with tension?", but rather, "How will we deal with tension?" In my view, the best way of resolving tension between science and scripture is to accept the scriptural view, and place contrary scientific evidence in a state of suspended judgement. Ideas are constantly changing in science. From time to time, new information is discovered, or new theories developed, that may shed some light on the apparent conflict between science and scripture. Like it or not, we do not expect the tension to be resolved on this earth. We will probably carry uncertainty with us until the end of time. Let us choose to apply our uncertainty to the scientific interpretations, and to apply our faith to the scriptures, not the other way around.

Summary and conclusions

> *"If science indicates a particular hypothesis and Scripture allows it, it seems reasonable to accept such a position."* (Webster 1994, p 298)

Nature is good because it is God's creation. Therefore the Seventh-day Adventist Christian can gain information about the character of God from the study of nature. The Christian can enter joyfully into this study, knowing that he is "thinking God's thoughts after Him." In his scientific studies, the Christian will keep foremost in mind his responsibility as a witness for Christ, doing all things with integrity, in a way that will bear inspection. As he exercises his reason in scientific pursuits, he will find new challenges and develop new abilities.

However, the Adventist scholar will recognize that nature has been corrupted by sin so that it no longer perfectly reflects God's character. The special revelation of the scriptures is therefore necessary in order to understand nature. Methodological naturalism may be a fruitful methodology in science, but its limitations must be recognized. Because God has intervened at times in history, some events may require supernatural explanations. Here, the scientist must understand that revelation also sheds light on nature and on its study.

Adventists must not enter into the study of science naively. Many dangers are present in scientific studies. Success in intellectual endeavors may produce awe at God's greatness or it may result in pride in one's own intellectual prowess. Failure to understand nature may lead one toward faith in the infinite God, or into agnosticism. Tension is to be expected between one's faith and the findings of science. On some issues, the scientist will have to choose whether to hold the scriptures as the most reliable authority, or whether to accept the current scientific interpretation as authoritative.

Despite these caveats, nature is a grand subject for study, and science, guided by scripture, can be an appropriate method for studying it. It is therefore perfectly appropriate, even desirable, for Adventists to participate in science.

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