Institute for Christian Teaching

THE BIBLE AND SCIENCE

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There was a time when many scientists believed in God as Creator, and some gave glory to Him, even in their scientific publications, for the wonderful things they studied in nature. But beginning with the Enlightenment the scholarly world began to shift away from reliance on authoritative sources such as ancient Greek science, and also from viewing religious sources like the Bible as being authoritative. This movement brought with it a rejection of miracles, or anything supernatural, and initiated the naturalistic philosophy that now dominates science and other disciplines.

In the centuries previous to this change it was common for people, including scientists, to interpret many common, ordinary processes in mystical ways. For example it was thought that the spirits were responsible for moving blood through our bodies, and William Harvey was not widely appreciated for his discovery that the heart is a mechanism that can be understood, a pump that moves the blood by processes explainable by natural laws. Surely it was appropriate for science to move away from the ancient mystical ways of understanding nature, but in typical human fashion the pendulum swung too far the other way, until the Creator has been pushed out of His universe in many persons' minds. In this essay we will seek to find a balanced, practical approach to the relationship between science and God's Word.

The Role of Assumptions

No one thinks or writes in a philosophical vacuum. To fully understand someone's writings we need to know the assumptions that he/she starts from - the philosophy that inspires their ideas. A person's views on the proper relationship between the Bible and their scholarly discipline will be heavily influenced by their interpretation of the origin of the Bible - on the nature of inspiration. The viewpoint presented here is based on my confidence in the Bible as the reliable, inspired Word of God, containing information communicated to the Bible writers by God, not word for word, but in a way that gives it truthful authority and makes it worthy of our trust. The Bible is not a scientific textbook in the sense of containing exhaustive information - it deals with scientific material in only a very brief manner. Nevertheless, I agree with Hasel (1980a) that "Whenever biblical information impinges on matters of history, age of the earth, origins, etc." that information is accurate. My purpose is to show that this concept can be developed into a philosophical approach that is practical and is beneficial to our science as well as our religious faith.

Relation between Bible and science

It is widely held that we should not try to relate religion and science; they should be kept strictly separate and should not influence each other. Those who hold a naturalistic world view (never accepts explanations for nature based on Divine actions) are likely to insist on keeping science and religion separate because they believe that religions are all based on ancient myths that have no basis in fact. But even many Christian thought leaders are very nervous about the idea of seeking a relationship between science and religion. This could arise for more than one reason. 1) There could be a fear that science will finally disprove our Christian belief system.

2) Another concern is that we may drop back into the old god-of-the-gaps reasoning of an earlier era. In British natural theology of pre-Darwinian times it was believed that God works through natural laws, and thus any process that operates through natural laws does not involve the direct, special action of God. It was thought that the direct action of God can only be invoked in processes for which we cannot find a natural explanation (god can be found where there are gaps in our understanding). The problem with this approach is that as science found explanations for more and more processes in nature, these gaps were filled and God was pushed farther and farther away and finally dispensed with altogether (or so it seemed). In reality our increased scientific knowledge has increased our understanding of how God's marvelous inventions work, but has not shown how those inventions were produced or at what level God's sustaining hand still operates. The problem with the god-of-the-gaps approach was that as more scientific explanations were found, it tended to undermine faith in God. Thus the concern about falling again into the god-of-the-gaps fallacy is valid, and deserves an answer.

3) An additional concern about integrating science and faith is that the conclusion "God did it" may eliminate any further need or incentive for scientific research, and consequently is bad for science. 4) This problem is compounded by the tendency to read into the Bible, between the lines, our pet ideas or ideas that have become culturally ingrained but are actually not in the Bible. For example in Darwin's time there was widespread Christian belief that all species of animals and plants were created just like they are now, with no change. In reality this idea cannot be supported from the Bible, but came from Greek philosophy, and the concept was "read into" such general phrases as "after his kind". Scientific research has produced abundant evidence that at least some biological change does occur, refuting this supposedly biblical concept and further weakening faith. 5) Another way of expressing some of the above concepts,

is that if we mix science and religion, the religion will bring biases into our science.

In this essay I propose that "keeping science and religion separate" is not a realistic approach if we wish to truly search for truth, especially if we believe that Scripture is a reliable document. However, any suggested method for relating science and faith must be developed with great care, and must have an answer for the following five concerns. We will return to them later.

1. Science may disprove our Christian belief system
2. The danger of returning to god-of-the-gaps thinking
3. Religious explanations ("God did it") may discourage scientific investigation
4. We may hold religious positions that are ultimately not biblical, and scientific disproof of these positions will discredit our faith unnecessarily
5. Religion will introduce biases into our science

Biblical anchor points

When attempting to integrate biological science and religion, an important task is to study Scripture carefully and determine what concepts are presented there that can potentially impact our understanding of biology. We will not necessarily all agree on every one of these points, but my list of "biblical anchor points" is as follows:

1. In a literal week of six consecutive, 24 hour days, God prepared the earth's surface and created living things (Genesis 1, 2).
2. At the end of that creation week, a complete ecosystem was in place, including invertebrates (creeping things), birds, aquatic animals, mammals (cattle), and plants (Genesis 1). Not much detail is given as to exactly what animals and plants were present, but the list includes some that do not appear until fairly late in the fossil record, like fruit trees (angiosperms) and humans. Thus the list of organisms present at creation week includes both invertebrates and also "higher forms" of life. This indicates that the major life forms were created, and did not result from evolution.
3. At some time after the creation, there was a global flood that destroyed much of life on the earth. Additional information can be found in the writings of E. G. White (1864, 1890).
4. All of the above occurred within a short time frame, measured in thousands, not

millions of years. This is not directly stated in Scripture, but is strongly implied in geneological information (Genesis 5) and in the evident fact that many Bible writers accepted the creation, flood and the early biblical record of human history as accurate. Many biblical passages make no sense whatever if the fossil record represents millions of years of time.

5. Jesus demonstrated in His miracles that God is very capable of instantaneously creating animal or plant tissue, or in restarting the biochemical processes in tissue that was no longer living. This is demonstrated in the turning of water to wine (John 2:1-10), creating food to feed several thousand people from a handful of fish and bread (Mark 6:30-44, 8:1-10), raising someone who had been dead for several days (John 11:38-44), restoring sight to blind eyes (John 9:1-11), and restoring tissue destroyed by leprosy (Luke 17:11-17) or restoring a withered hand (Mark 3:1-6).
6. After sin the biological world began to change (Genesis 3:14-19). Thorns and thistles began to appear, and some large mammals became carnivorous, that were not carnivorous before (Isaiah 11:6-9). This conclusion depends on the assumption that the new earth will be a restoration of the original pre-sin earth, and conditions described in the new earth thus were also characteristic of the earth as created in the beginning.

If we look this list over carefully it is evident that it represents only a thin skeleton of information about biological history. It includes enough to clearly differentiate between the major philosophical positions on origins that are in evidence today, but it leaves much for us to figure out. It says nothing about specific geological processes that buried the fossils, or about natural selection or mutation, and it does not indicate how much biological change has occurred since sin. Our explanations and answers for these questions not directly answered in the Bible are only humanly devised hypotheses, and we must never forget that. We will come back to this point later.

A proposed approach to the relation of science and faith

If we compare science and Scripture and find things that don't seem to fit, must we accept science and reject the Bible, or vice versa? Or is there a better way? The following section explores the latter question, suggests some answers (from Brand 1985, 1997), and ends with

illustrative case studies showing the proper relation between science and religion.

Biblical information and scientific information originate through different processes, and this difference must be kept in mind as we consider the relationship between then. The Bible claims to be a body of information communicated to us by God, who knows and has participated in the history and workings of our planet and of life. This communication is in a book completed nearly 2,000 years ago, written in Hebrew and Greek. Our exegetive task is to see past the language and cultural differences expressed in the Bible, to understand the message that it contains. Careful study of the culture and usage of words and expressions in Bible times helps us to correctly understand the Bible (Hasel 1980b, 42-65). Because the Bible claims full inspiration by the same God for all portions of Scripture, the message it contains is a unity. Thus, one portion of Scripture can be better understood by comparing it to other portions that deal with the same subject - the Protestant Reformation principle of "Scripture its own interpreter" (Hasel 1980b, 70-79). This position is the one adopted in the present work.

Science, in contrast, is an on-going, open-ended human search for understanding of the physical universe. It utilizes observation, experiment, and analysis to test the validity of our ideas (hypotheses), and to help us to think of new hypotheses. Science does not claim, and in fact vigorously rejects the notion, that any of its conclusions has divine authority. The Bible claims authority; science inspires confidence by its success, but does not claim "authority"; its claims are always subject to revision when required by new data.

Science is a slow process, with many human limitations, but still a very effective way of discovering truth, within the limits of the philosophy that scientists have chosen to adopt. We often do not have enough data to be certain of the correct scientific explanation, or theory, but even then the data help to eliminate some of the incorrect theories. Accumulating new data also enable scientists to develop new theories that they had not thought of before. These new theories may be stepping stones to even better theories, or they may stand the test of time and turn out to be correct. Science is always a *progress report* on the tortuous road to truth - not final, absolute truth. In contrast to that, the Bible claims to deal with propositional truth originating with the God who has seen and understands all of earth history and all natural laws. How does a scientist relate the two? To what extent can science "correct" the Bible, or at least our interpretation of it?

Science and Revelation: a Working Relationship

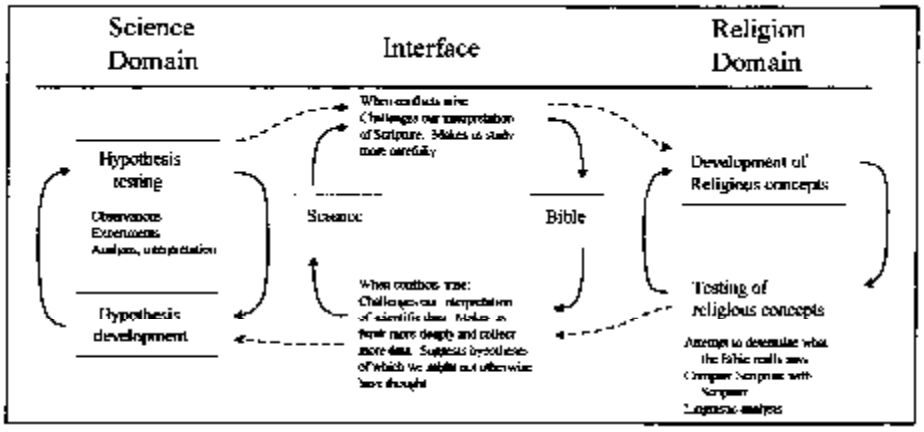
Within Christianity there are many different attitudes toward the authority of the Scriptures, but this paper is built on a conviction that there are many lines of evidence indicating that the Bible writers speak for a loving and all-knowing God whom we can trust, and in whose prophetic and historical messages we can have confidence. Consequently I expect there will ultimately be no conflict between science and revelation, when we correctly understand both. Within this framework, an effective working relationship between science and revelation can result if we proceed through the following steps in our attempts to understand truth:

1. The accumulating data from scientific research suggest new ideas or hypotheses that we might not have thought of if the research had not been done. In the process science sometimes challenges us to examine our beliefs more closely.
2. When the new idea involves a subject concerning which the Bible speaks, we examine all relevant biblical passages, comparing Scripture with Scripture, using the Bible as its own interpreter. In doing so, it is important to make use of all the latest information that helps us to reach a correct understanding of the original meaning of the words used in the Biblical manuscripts. In this way, we attempt to understand exactly what the Bible does or does not say about our new idea. Is the idea compatible with the Bible or not? Do the relevant Bible statements say what we think they say, or are we incorrectly reading something between the lines?
3. We then make one of the following decisions, or some appropriate variation of one of these:
    a. It is evident that revelation does not speak to this issue at all, and does not help us in our research.
    b. We conclude that revelation does address this topic, but does not say anything against the new idea; there is no biblical reason not to accept it as a valid possibility. We then proceed with further scientific research to rigorously test it. This research may give us increased confidence in the idea, or it may lead to even better hypotheses, which would also need to be compared with the Scriptures. In some cases this careful study of Scripture may show us that an idea we thought was in the Bible is actually not there.
    c. Our study indicates that revelation clearly contradicts the new scientific idea, thus challenging our scientific conclusions and telling us to go back and do some more

research because there is something wrong with our interpretation of the data.

If we follow this process, the Bible is maintained as the standard for religious doctrines and for areas for which the Bible makes claims in natural history, and yet science and the Bible continue to shed light on each other. Science suggests ideas that may help us to recognize that we have been reading some preconceived idea into the Bible that really is not there. In other cases the Bible can alert us to problems in our scientific theories, so that we can turn our efforts toward developing more accurate interpretations of the data. This can be an on-going feed-back process in the interface between science and religion that challenges us to dig deeper in both areas (Fig. 1). When there are conflicts between our science and our religious concepts, each domain challenges us to more careful study and research in the other domain. Our Bible-based models of earth history can also suggest testable hypotheses that we may not have thought of otherwise.

Figure 1. A representation of the relationship between science and religion.



A danger to avoid

At this point we must remind ourselves not to let our religious views cause us to impose artificial interpretations onto the scientific data, or to ignore data that don't seem to fit. If the data seem to contradict what we believe is true, we still do not need to fear good data. We may indeed struggle with seeming conflicts, because of limits in our available data and our understanding of how to interpret them, but *ultimately* genuine truth will not contradict itself. In the meantime we can live with unanswered questions as we continue to search for answers, and not pretend to have answers when we really do not. True scientific conclusions do not need careless arguments to support them. They will stand on their own eventually.

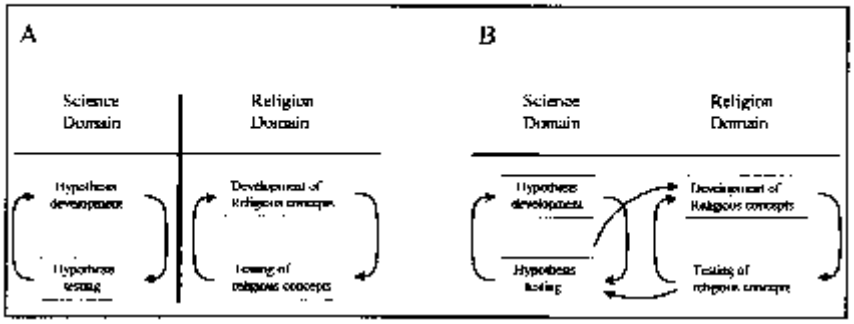
We must ask again how science can be an open-ended and open-minded search for truth if we adopt the view that "whenever biblical information impinges on matters of history, age of the earth, origins, etc., the data observed must be interpreted and reconstructed in view of this superior divine revelation which is supremely embodied in the Bible" (Hasel 1980a, 68)? Would we reject a scientific idea on scriptural grounds alone? That seeming contradiction can be resolved if we have a correct understanding of the domains described in Fig. 1. The processes occurring in the scientific and religious domains are different and cannot be interchanged. Scientific experiments are not a basis for testing divinely-inspired scriptural statements, and science does not test its conclusions by linguistic analysis and "comparing Scripture with Scripture." The two types of processes should not be confused or blended together, but the interaction between them occurs in the thinking process called here "the interface".

We can illustrate this by asking whether the fossil record represents millions of years of evolutionary history, or a short time span consistent with the biblical view of history. The most significant line of evidence supporting hundreds of millions of years is radiometric dating. If I study the evidence and conclude that "the radiometric data indicate a 540 million year time span for the fossil-rich part of the geologic record, but this time period is not correct because the Bible contradicts that conclusion," that would not be accepted as a scientific statement and perhaps is not even a good religious statement, because it is a confusing statement. However, I could conclude that "the radiometric interpretations currently available are most consistent with a 540 million year period of deposition for the Cambrian to Recent fossil record (scientific domain), but my study of Scripture (religion domain) leads me to predict (interface) that there must be additional scientific discoveries awaiting us that will lead (scientific domain) to a reinterpretation of radiometric data, and a much shorter time span." That is an entirely valid, honest statement, that cannot be criticized for improperly mixing science and religion. Many persons who have confidence in currently accepted radiometric dates will find the statement hard to believe, but it is actually a prediction that certain types of data will be eventually discovered, and in the long run it is scientifically testable. The honest, probing attitude indicated by that statement, if combined with the scientific quality control process, could also stimulate more careful scientific research as well as more careful study of Scripture that might otherwise not have been done. In the meantime, if we truly have confidence in God's communication to us we will not be uptight about not having the answers, but will be comfortable living with unanswered questions.

Two invalid approaches to the relation between science and religion

Earlier I concluded that "keeping science and religion separate" is not a valid approach. That conclusion can now be refined to include the concepts in Fig. 1. There is a procedural sense in which science and religion are separate. The two use different methods, and the second of the two statements about radiometric dating illustrates the sense in which science and religion must be kept "separate," or at least not be confused. The interface (Fig. 1) allows interaction between science and religion without confusion. Fig. 2 illustrates two inappropriate ways that I have encountered in which some individuals try to keep science and religion separate. Method A keeps a solid wall between science and faith, and does not let them interact. But how can I believe one set of beliefs in church, and a different and incompatible set in the science lab? This approach may work fine for, e.g., chemists or physicists who never ask questions about earth history, but it cannot deal with questions of origins without being schizophrenic.

Figure 2. Two ineffective ways to try to keep science and religion separate.



Method B portrays what I have often observed as the actual result of attempting to keep science and religion separate. Science is seen as the source of facts, while religion only deals with some vague notion of spirituality. The person taking this approach does not actually keep science and religion separate, but tests Bible statements by external, scientific criteria. Steven J. Gould (1999) is an example of this approach.

In contrast to these, the interface in Fig. 1 is the *key* to an honest and productive interaction between science and religion; the secret for recognizing the value of science and granting it a constructive role in the service of our Bible-based faith, while still maintaining the Bible as the authoritative standard for our faith. This approach to the relation between science and faith is not just a theoretical idea. Some of us have been using it for years, and find it to be effective and practical.

Biases from various sources

Could a person's religion bias his or her interpretation of scientific data? In other words, can religious belief cause a scientist to accept data that they like and ignore other data, or to interpret the data to fit their beliefs, whether or not the data actually do fit those beliefs? It certainly can, and I could list a number of cases in which it is clear to me that this has happened. However, if we are not going to be superficial in our analysis of this problem we also have to ask another question: can a naturalistic philosophy bias a scientist's interpretation of data? I believe there is evidence that it can. Our research will only answer questions that we are willing to ask, and naturalism only allows certain questions to be asked. Consider the difference between the two questions in each of the pairs in Table 1. Naturalism only allows question number one, and thus answer 2C is ruled out of scientific consideration by strictly *a priori* considerations. Naturalism has a powerful biasing influence in science, in steering scientific thinking and deciding, in many cases, what conclusions will be reached. This is commonly not recognized, but it pervades the scientific enterprise.

The best example that I know of to illustrate this problem is in the field of geology, but the same principles can apply to any discipline. When the discipline of geology was taking form in the 18th and 19th centuries the geologists Hutton (1795) and Lyell (1830-1833) each wrote books in which they developed a paradigm of geology that rejected the catastrophism of their day, and replaced it with a theory based on uniformitarian (the same natural laws have always been in operation) and gradualistic (always slow, gradual) processes over eons of time. Lyell's book was the more influential one, and constricted geology to a very gradualistic uniformitarian paradigm until the mid 20th century. It is now apparent that the catastrophists in Lyell's day were the more unbiased scientists, and the data were more consistent with their views than with Lyell's (Gould, 1984).

Table 1. Differences between questions that are allowable in a naturalistic and in a non-naturalistic philosophy.

A. Question 1: Which hypothesis is correct?

a. Naturalistic hypothesis A

b. Naturalistic hypothesis B

Question 2: Which hypothesis is correct?

a. Naturalistic hypothesis A

b. Naturalistic hypothesis B

c. Life did not arise by a naturalistic process (the implication of this answer-creation by an intelligent Designer - cannot be part of the testable hypothesis, just as the concept of naturalism cannot be a testable part of an evolutionary hypothesis)

B. Question 1: Which hypothesis is correct?

a. Gradualistic evolution of all life forms

b. Evolution by punctuated equilibrium

Question 2: Which hypothesis is correct?

a. Gradualistic evolution of life forms

b. Evolution by punctuated equilibrium

c. Independent, non-evolutionary origin of major groups of organisms; evolution only within each of these groups

Lyell's strictly gradualistic version of uniformitarianism was bad for geology, because it prevented geologists from considering any hypotheses that involved catastrophic interpretations of the data (Gould 1965; Krynine 1956; Valentine 1966). These authors are not recommending a return to a Bible-based catastrophism. But it is now recognized that many sedimentary deposits were catastrophic in nature. This recognition has brought the discipline of geology to accept the view called neocatastrophism, a naturalistic paradigm that explains the geologic record as developing over millions of years of evolutionary time, but with many catastrophic events that left their mark on the rocks. Now that Lyell's bias has been recognized and abandoned, the philosophy of naturalism does not prevent recognition of catastrophic processes. This episode demonstrates that bias is not a religious problem. It is a human problem that everyone must be

careful of, no matter what their personal religio/philosophical views.

There is another pitfall that must be diligently avoided, and that is the tendency to think that because we believe in the Bible and try to use the Bible to suggest scientific hypotheses, the hypotheses that we think up must be right. This is dangerous because the Bible never gives us detailed information on scientific subjects. It just provides a skeleton of information that may be very helpful by directing us to begin a search in a particular direction. However, once we start in that direction, pursuing hypotheses of details not specified in the Bible, we may need to make several changes before we find scientific explanations that will stand the test of continued investigation. Scripture indicates that theories about biological origins based on naturalism will be less successful than theories based on recognition of Divine intervention in history, but we may have to search quite awhile before we determine what types of biological change have occurred and what types have not occurred.

Another example of the same concept comes from the field of geology. Christians who accept Genesis as a historical account of earth history recognize a global flood as part of that history. However, there has been a tendency to also assume that all or most of the fossil record was produced during that flood, and there was not any significant amount of geological activity between creation and the flood. That concept of no formation of fossil-bearing rock formations before the flood is not found in the Bible - it is strictly a humanly-devised assumption, and it may not be correct.

Take science seriously, but carefully evaluate its interpretations of data

It can be tempting to take an all or nothing approach to data interpretation - either accept whatever science tells us, or reject everything that science has to say. Neither approach is adequate for discovering truth about the natural world. At the beginning of this new century we cannot escape the challenge to carefully weigh science's conclusions and accept only that which holds up under careful scrutiny. Science has followed a naturalistic philosophy that brought serious biases into its interpretations in many fields, but on the other hand scientists are not stupid. If a large amount of data support the theory of, for example, microevolution (changes within species), instead of ignoring the data, it is likely to be more productive to ask what is the real interpretation of those data? Does the Bible help us to evaluate it? What reinterpretation can make sense out of them? What determines what types of changes can occur? We will

generally make more progress if we take science seriously while not swallowing its presuppositions and the interpretations that follow from those presuppositions, but think for ourselves as we develop a new synthesis of data and biblical principles. Persons of differing philosophy can learn from each other, and they can respect each other as friends even though they disagree on some significant matters.

Science cannot replace faith

In our attempts to find a synthesis of science and faith, one big mistake often made by Christians is to allow scientific arguments to replace faith. One sure way to attract a crowd of Christians to a lecture or evangelistic sermon is to advertise that, "a renowned scientist will present startling scientific proof of creation". We want to have proof - to demonstrate once and for all that "those evolutionists are all wrong" and we can prove it. It is natural and right to want to know that what we believe makes sense; that we don't have to leave our brains behind when we go to church. But can we explain the resurrection, or the virgin birth, or how we will be able to travel through space to heaven? Will we ever, this side of heaven, be able to explain how Jesus made wine out of water? Or how He created life? There will continue to be questions that we cannot answer.

We can match those questions with a different set - can we explain electricity? Oh yes, we can describe how electrons move through a medium, but do we really understand why that happens? Do we understand how gravity works? We can describe in great detail how much attraction a body with a given mass will exert on another body, and how it will affect the movement of planets and stars, but those are only descriptions of the effects of gravity. Can anyone explain how it can be that one object can attract another object millions of miles away from it? If we can't answer these questions, why would we think we will have scientific proof to answer all our questions about origins?

If we want all of our questions about creation or biological history answered before we are willing to have faith, we will never have faith. I believe that God never promised proof - He only promised us sufficient evidence on which to base our faith, and we must trust Him for the rest. God gave us brains to be used, and one productive use for them is to seek answers for our questions about origins, but it is not realistic for us to expect answers to the biggest questions in the near future. The important issue is whether we know God. Have we become so well

acquainted with Him that we can trust Him and His Word while we continue to search for answers and learn to live with unanswered questions?

Science is at its best when studying ongoing processes. Science has built up its well earned prestige in the investigation of biological, chemical, and physical processes that are happening now and can be observed and experimentally manipulated in the laboratory. When we ask what happened in the distant past, science is at a big disadvantage, because those ancient events cannot be observed. We cannot replay the videotape of history and see what actually happened. We are dependent on limited circumstantial evidence for study of biological history. It is fascinating to search for answers, and we do find many answers when we search diligently, but if confidence in our ability to find all the answers replaces our faith in God it is no longer constructive.

Answering objections to the integration of science and religion

At the beginning of this discussion we considered several objections to efforts to integrate science and religion. It is now time to evaluate whether my suggested approach to such an integration can overcome these objections.

1. *Science may disprove our Christian belief system*. If we open up our belief system to the formulation of testable hypotheses as I have suggested, it does mean that if our beliefs are wrong, they may be disproved. Are we confident enough to accept that possibility? If our beliefs are false, isn't it better to find out? It is possible that some of our specific beliefs about origins that involve details not given in Scripture may be wrong, and it is better for us to learn that. Ideas that are truly God-given biblical truths, on the other hand, will not be disproved. Nature and revelation will not ultimately contradict each other, for both came from the same God. It is often more comfortable for us to keep our beliefs close to our hearts and not let science look at them, but if we do that we will miss opportunities for discoveries that will vindicate our trust in the Creator and help others to learn to trust Him also, while possibly also revealing that some of our ideas are wrong and not biblical.

As we use science to study questions of origins and biological history, there is a danger that we should be aware of. Science has for so long used naturalistic thinking to explain all the data, that it takes diligent, careful study to see past those deeply-entrenched interpretations and find new ways to understand the data. Also scientific research typically does not yield its secrets

quickly or easily. It often takes years of effort to resolve a difficult scientific puzzle, and only the persistent researcher will succeed. A researcher with a settled confidence in Scripture will at times have to stubbornly trust the God of the Bible until they finally are able to understand the data, and some of our questions will probably not be answered on this earth. Previous experience suggests that we will continue to find strong evidences of the Creator's hand in biological history and earth history, but we will also struggle with solutions to some difficult puzzles.

In summary, it is my observation that those who warn against attempts to integrate science and faith are often persons who do not believe that the Bible gives facts, but only "spiritual truths". On the other hand, if we have confidence in the truth of Scripture we don't need to fear honest research, but we must avoid superficial efforts or they could lead us in wrong directions.

2. *The danger of returning to god-of-the-gaps thinking*. It is important not to fall back into that trap. It is not necessary to do so if we carefully examine our logic in our integration efforts. One difference today from previous centuries is that in some areas of science we have learned enough for our arguments to be the opposite of the god-of-the gaps. For example in molecular biology the more we learn, the more difficult it is to explain origins without a Creator. Instead of God being needed only where there are gaps in our knowledge, the more data we collect, the more evident it becomes that we need God in our explanations. In other words, some gaps are not gaps in our knowledge, but are true gaps in the sequence of natural causation, and more data don't close these gaps but open them wider. I believe that if Darwin's theory had not been proposed until today, our much increased knowledge of molecular biology would make it impossible for his theory to gain acceptance.

In summary, fear of the god-of-the-gaps fallacy should not frighten us away from the efforts to integrate science and religion into a meaningful synthesis. It is important that we be aware of the nature of various logical fallacies, like the god-of-the-gaps, and avoid them by careful self-evaluation of our logic and by paying attention to other scholars' criticisms of our ideas. Just because a task requires navigating around pitfalls is not a good reason to refuse to tackle the task. Ask any of the great explorers about that.

3. *Religious explanations ("God did it") may discourage scientific investigation*. The way some persons approach this subject does have that effect. However, it does not need to be

that way. The example given above, relating radiometric dating to Scripture, shows how conflicts between science and Scripture can challenge us to more careful and diligent research in both science and in our religion. We have also seen that a biblical position does suggest that some current scientific research is not worthwhile, but it also suggests new approaches to research that can, and already are, resulting in productive science (e.g. see Brand 1997, ch. 5).

4. *We may hold religious positions that are ultimately not biblical, and scientific disproof of these positions will discredit our faith unnecessarily*. But if we have beliefs that are not biblical, don't we want to find that out? Scientific knowledge at any given time includes many beliefs that will later turn out to be false. That doesn't keep scientists from pursuing research, and ideally they readily admit when they discover new data that change some scientific belief (especially if it challenges some other scientist's beliefs, rather than their own!). Religious scientists can pursue research with the same confidence and openness to change in our humanly devised ideas about details that aren't given in Scripture.

Problems are caused by some creationists who devise very speculative theories about origins, that go way beyond what is given in the Bible, and proclaim these as TRUTH. When scientists encounter these careless and embarrassing theories it does make our faith look bad. The problem here is not the effort to integrate science and faith, but the careless and uninformed way that it was done. The solution is not fear of research or fear of the effort to integrate science and faith, but careful, well-informed study.

5. *Religion will introduce biases into our science.* Whether this happens or not depends on the individual and how they approach the subject. Some persons commonly twist scientific data, accepting some data and ignoring other data, to make it fit their religious ideas. Other persons are much more careful and objective in their thinking. This is not unique to creationists, but is also true of other scientists. I have encountered a few (but not many) extremely biased and manipulative attempts by non-creationists to make the data fit their theories, and I have also seen the same thing done by some creationists.

One factor that greatly affects a person's objectivity is their willingness to seek, and take seriously, input from others. There is safety in numbers, and it generally seems that others, especially those who disagree with us, are more likely than we are to see the weakness in our arguments and theories. If two persons with differing views are involved in the same type of research, they are each likely to notice things that the other may overlook. Consequently they

will both probably be more successful if they seek to learn from each other.

In summary, religion can introduce biases into our science, but so can any other philosophical approach. The answer is to be aware of the problem and consciously analyze our thinking to try to see if we are not being objective, and to communicate with others regarding our ideas and take seriously their criticisms. That doesn't mean we will always agree with our critics, but we can evaluate whether their criticisms are based on good evidence or just on their personal opinions. Awareness of different points of view on an issue generally improves our ability to reach a defensible conclusion. The reverse of this is also true - if we *do not* seek to integrate science and faith it is unlikely that we will adequately understand the areas where science and religion seem to be in conflict. If we do not put forth serious effort to challenge conventional thinking and develop a positive synthesis of science and faith, we are likely to accept conventional thinking without knowing whether or not it is based on a solid foundation.

Is this issue important for Christian education?

Some will criticize our proposed integration of Scripture and science as an inappropriate exercise. This criticism can be addressed by asking a broader question - is the concept of Seventh-day Adventist Christian education compatible with the sophisticated academic world of the new millennium? Higher education is based on an open search for truth, wherever it may be found, and yet our church has a particular set of beliefs, a preconceived concept of what the basic principles of truth are. Many would tell us that the two concepts "Seventh-day Adventist education" and "University" are incompatible - that the intellectual openness of a university cannot exist in a religious setting that presupposes a predetermined set of beliefs. It is also sometimes said or implied that if the church is willing to have a true university, it will have to face the fact that in such an institution unique SDA beliefs will and should weaken and possibly even disappear by exposure to the broader world of truth.

Let's examine exactly what is implied in that philosophy. Is it true that a religious university has a set body of beliefs, while a secular university is characterized by open-minded consideration of all issues? Consider an example. For instance, the question of a literal creation of life on the earth versus evolution of life over billions of years - are these two options both discussed and weighed in a completely open-minded way in secular universities, while only in SDA and other religious institutions there is a preconceived idea of truth? In reality it is naive to

think that secular universities are open minded while religious institutions are not. Each works within a particular philosophical system.

The history of higher education indicates a strong pattern of church operated universities drifting away from their religious roots. They tend to abandon the concept of allowing the Bible to assist them in evaluating ideas, in favor of a philosophy more characteristic of secular institutions. The question is, should it be that way? Did the institutions that followed that path make the right choice? Does open-minded thinking inevitably lead to that end?

Two hundred years ago, during the Enlightenment, scholars began to move away from the excessively supernaturalistic thinking of the dark ages. The scientist Harvey, e.g., had helped them to realize that spirits don't make the blood flow in our bodies; the heart is a pump - a mechanism that can be understood and whose actions can be explained by natural laws. Findings like this began to erode belief in the supernatural, and as humans so often do, they went from one extreme to another. A philosophy gradually developed that would not accept any explanation or theory that implied any type of supernatural involvement in earth history or biological history at any time. This became the ruling concept in science, and made its way into the thinking of other disciplines as well, including theology. Today, this philosophy of naturalism (materialism) is the foundation of scientific thinking and of much theological thinking as well. It is at the core of the education that is offered in most institutions of higher education. In contrast, the beliefs of the Seventh-day Adventist church are based on the conviction that God has involved Himself in history in very real ways. It is true that our hearts are efficient pumps that operate day after day according to God's laws of nature, without His needing to tinker with them on a continuing basis. However, we believe that it was God who designed and created hearts in the first place. We also believe that God was directly involved with mankind in other times and places. He gave Moses the tables of stone; He spoke to the prophets and gave them information that guides our lives today; He instantly healed and raised the dead. Our conviction of the reality of these things is the foundation of the Seventh-day Adventist church.

A friend of mine one day was discussing the difference between religious liberals and conservatives. He pointed out that the difference was in their attitude toward scriptural authority. Conservatives accept the Bible as authoritative in religious belief and practice, while liberals do not believe it is authoritative. I replied that if the Bible is not authoritative, then the human mind becomes the measure of all truth. His answer was "that is true, but that is all we have." I don't

know of a better way to summarize the difference between the two philosophies - in one case God's communication is the standard, while in the other case humans and their understanding is the standard for measuring truth.

Both conservative SDA schools and secular education are based on a particular philosophy of what is truth. Secular higher education is built on the philosophy of naturalism. SDA education is built on the philosophy that God's interaction with us is real and literal. In both cases the education assumes that certain concepts (naturalism or supernaturalism) are true, and builds from there. Anyone who believes that secular universities are more open-minded has not tried to bring a meaningful discussion of creation or of salvation into a class in such an institution! In most cases this would not be well received. The difference is not in the degree of open-mindedness, but in the philosophy that underlies everything that is presented.

Why would anyone claim that an SDA university, if it is going to be a real university, should be allowed to follow academic scholarship wherever it leads, even if that means it will follow the path that other Christian universities have taken and move away from its uniquely Adventist beliefs and values? Such a suggestion implies that we should move away from this belief system because other systems of thought are superior. Some have expressed this view by saying that the SDA church with its sabbath schools and church schools is a very supportive, nurturing environment in which to grow up, but when students reach the college level it is time they learned that the SDA belief system doesn't stand up. In another case an individual discussed a conflict between SDA Christian values and the values of a particular scholarly writer, and concluded that at this level of education (college or university) "our first allegiance is to our discipline." That statement is only logical if we believe that the ideas of any (probably non-Christian) scholar are a higher standard than our Christian values, or else that it is better to follow the majority, whether they are right or wrong.

What will be the most constructive approach for scholars in SDA colleges and universities? The easy path is to uncritically pass on to our students everything we learned in graduate school, or whatever we have read. After all, who are we to question the great minds of today; the leaders in modern scholarship? The problem with that approach is that God is left out of the picture. On the other hand Christian scholars cannot pretend that the modern scholarly world doesn't exist. We cannot close our eyes and ears to keep from being contaminated. The same intellectual culture that gave us the naturalistic theory of evolution and naturalistic

approaches to theology also developed the polio vaccine, rediscovered and documented the value of a vegetarian diet, and invented the computer with which this article was typed. There has never been a more challenging or exciting era for Christian scholars. We must accept the challenge to study and sift through the material that modern scholarship gives us; to analyze what we were taught, in order to assimilate what holds up and discard what is in error. A Christian university should be a center where the highest intellectual efforts can be exerted toward understanding the world around us in light of Bible truth.

The events in the New Testament occurred during the highly developed era of Greek culture, but Jesus and Paul believed without question that their philosophy was superior to that of the best minds of their day. If we believe that the SDA message is real, we will have the humble but firm conviction that our Christian philosophy is superior to that of the best secular philosophy of our day; not because of our brilliance, but because of the guidance of God's messengers to us. There are risks in this approach, just as there are risks in unthinking acceptance of the predominant popular ideas. These risks arise because we are human, and prone to read our own fallible ideas into the Bible, between the lines, and then think the Bible supports us. I can think of examples, individuals who have taken a strange intellectual course because they believed that any ideas they held must be right, because they believe the Bible.

Science has a solution for the analogous problem in scientific research - bias is kept under control by communication with one's colleagues. There is no reason to believe that an individual scientist is more objective than other people. Objectivity enters the scientific enterprise when scientists submit their ideas for peer review through discussions with colleagues, presentation at scientific meetings, and peer-reviewed publication. Colleagues' critiques of our work help us to see where our ideas don't stand up to careful scrutiny. However, the insightful scientist does not mindlessly accept or reject all suggestions offered by reviewers, but thoughtfully weighs each criticism to determine which are well-supported and which are not. Some of the most telling criticisms come from those who disagree with the point of view being presented. But it is important to evaluate whether the criticism is solidly based on data, or based on a set of assumptions that are open to challenge. Through this on-going process a scientist who is willing to learn from the process is assisted in avoiding extreme, untenable positions.

A similar process of communication with peers will assist Christians in judging our own fallible ideas as we develop a Biblically consistent approach to modern scholarly disciplines.

Critical evaluation by others helps us to recognize where our thinking is superficial or is not biblical. The other crucial part of this process is a prayerful sense of our need for the guidance of the Holy Spirit. The truly Christian university offers a unique situation for this process to occur - an opportunity to advance in understanding beyond what is likely to be encouraged in a secular environment. The following statement indicates that it is not God's plan for His people to hide from careful scholarship.

> "A knowledge of science of all kinds is power, and it is in the purpose of God that advanced science shall be taught in our schools as a preparation for the work that is to precede the closing scenes of earth's history" (FCE p. 186).

This is not a time for timid Christian scholars. We cannot escape the task of comparing human knowledge with Bible truth, and after sifting out the obvious errors in our own education, to develop a synthesis of biblical truth with those modern contributions that stand the test of comparison with the Bible. If we allow God's Word to also suggest new insights to us, we can advance beyond the ideas that have come from purely human sources. To do this requires truly creative and insightful minds and the courage to speak out even on unpopular topics when necessary - I repeat, *this is not a time for timid Christian scholars,* but a time to ask God to open our minds to the scholarly advances that will be a blessing to His work and will give Him glory.

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