

# Science and Religion:

## PROBLEMS IN DIALOGUE

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Among the current and potential problems that traditional Christianity faces, the difficulty of dialogue between science and religion probably cannot rank as the most important. The greatest concern is whether man can come to relate to his fellow man and to God on the basis of the great principle of love. However, there are aspects of almost all the sciences that conflict with aspects of Christianity; and how the Christian churches — the Seventh-day Adventists in particular — respond to these challenges is of importance.

Perhaps at some time in the history of the Adventist church it was possible to ignore the questions of science, in the hope that few church members would be exposed to them. Such a hope would be unrealistic today, however, since both the communication media and the systems of education give wide exposure to scientific theories. At some point, every observant, intelligent individual will encounter scientific ideas and theories that in varying degrees are incompatible with traditional Christian beliefs. In view of this fact of modern life, the attitude of Adventists toward aspects of science becomes an important consideration. At least partially, the ability and willingness of the church to discuss candidly such questions as science poses can be regarded, perhaps, as a measure of the faith of the church in its own system of beliefs.

In the dialogue between science and religion, problems arise at two distinct levels. The first, or *conceptual*, level concerns the facts and theories of science that may conflict with religious doctrine — as, for example, the theory of evolution. At the more *abstract* second level are the methods and characteristic thought processes of scientists that may differ from those em-

ployed by nonscientists. Because the nature of the scientist's training program may be highly complex, it is likely that the typical thought patterns of the scientist will differ fundamentally from those of the nonscientist. Each person must frame thoughts in words if he is to communicate. However, the scientist's methods, vocabulary, and perspective may make it difficult for him to communicate his viewpoint in words that are shared in common with the nonscientist. I will focus here on the *abstract* level, where the problems remain poorly understood because they are difficult to perceive. (I do this because I feel that the challenges of scientific theories and facts are relatively well known.)

A personal experience illustrates the difference in perspective of the theologian and the scientist. My father has been an Adventist minister for over forty years. As one might expect, his concepts of the structure and processes of the universe are strongly influenced by the religious framework that has been the basis of his lifework. My background, on the other hand, is that of a scientist who took as one area of specialization for the doctorate the fossil evidence for human evolution, and who has been engaged in research for several years. My father and I occasionally engage in friendly but vigorous debate on this aspect of science and religion. As a rule, my father has the last word in these debates, and usually he summarizes his opinion of the relationship between these two spheres of knowledge somewhat as follows: "There is no conflict between religion and *true science*. The only problem that arises is between religion and science falsely so called."

One of this century's leading paleontologists, G. G. Simpson, observes that "evolution and *true* religion are compatible."<sup>1</sup>

These converse opinions summarize the basic elements of the conflict between science and religion. With his religious perspective, my father takes as his reference point his *religious beliefs*, which he assumes to be absolute. His religion is true, and those aspects of science in agreement with his religion are true; all other science is false. On the other hand, Simpson takes as his reference point that which he assumes to be true in his *science beliefs*. By his definition, only those aspects of religion in agreement with science can be true. Both men assume that their particular *frame of reference* represents at least an approximation of something we might call ultimate truth.

In my opinion, *ultimate religious and scientific knowledge* simply is not available to man — because he cannot encompass all knowledge even if he had access to it, which obviously he does not. That both science and traditional religion are changing in terms of content and emphasis is eloquent testimony that in neither sphere of knowledge has man attained ultimate

truth. Both scientists and nonscientists, therefore, would do well to approach areas of conflict between science and religion with a great deal of humility.

In the following sections I shall discuss briefly: (a) the education of the scientist; (b) the methods used by the scientist; (c) the implications of scientific training and methodology for dialogue between science and religion; (d) church responsibility in relation to science and religion.

#### THE EDUCATION OF THE SCIENTIST

Probably no ability is more important in a scientist than the ability to view existing knowledge critically. Blind faith in ideas or persons (here used in the religious sense, as in "faith in God") is strongly discouraged in the study of science. For example, few things are dearer to the heart of a typical graduate student than demonstrating that a hypothesis or conclusion of one of the established scientists is wrong. This basic attitude has proved extremely beneficial to science, where change is expected and desired. However, in a belief system that many may want to keep absolute and unchanging, such an attitude could be dysfunctional.

Another ability encouraged in the development of a scientist is the ability to integrate theories and data from many different sciences. The graduate student learns to fit his contribution into what has already been learned and to make certain that it is consistent with principles already discovered. If he is unable to do this, he must be very cautious in promoting his ideas.

The final point important to the discussion of a scientist's education is that scientists are encouraged to consider phenomena purely on the basis of materiality. By materiality I mean that a given phenomenon occurs on the basis of intrinsic factors and that no external, nonmaterial forces (such as God) add to that phenomenon a dimension that cannot be studied by scientific methods. Therefore, the science student must assume that vital forces (God) do not affect the phenomenon he is studying. It is an easy step from this point of view to one that assumes that God does not exist. This last point, however, is not a necessary conclusion arising from the concept that phenomena are material by nature.

#### THE METHODS USED BY THE SCIENTIST

Just as there are affiliated persons who do not approximate the ideals of the religious group, there are scientists who do not approximate the ideals of scientific method in their research. For purposes of discussion, however, I shall assume the ideal situation.

If the scientist begins with the assumption that a problem is solvable by

some analytical method, first he establishes a hypothesis. The hypothesis is a *tentative statement* based on his specialized knowledge. In this statement, in effect, he predicts how an experiment will turn out and then how this result will affect the theory to which the hypothesis is related. Hypothesis-formulation is followed by hypothesis-testing — which results in acceptance or rejection of the hypothesis. The methods of testing hypotheses vary extensively. A chemist may develop the hypothesis that mixing reagent A with reagent B should result in a new molecule C. Proof in this situation is rather direct. Most hypothesis-testing in the biological sciences is much less direct and may involve the use of inferential statistics. In this type of testing, the scientist tries to determine if what he observed could have resulted from chance factors. If so, he is not in a position to accept his hypothesis.

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It is important to emphasize that in all hypothesis-testing there is the chance of error in either accepting or rejecting the hypothesis. This is particularly true in the biological sciences. The scientist usually meets the situation by saying, "I think I am right, but there is a 5 percent chance that I am wrong." There are many problems inherent in hypothesis-testing that are not germane to our discussion. The main point is that there is always a residual possibility of being wrong; hence the scientist assumes that all people will qualify his statements, even though he does not.

A theory becomes established when hypotheses that are related to it and support it are shown to be true in the scientific sense. Perhaps nothing is more misunderstood by the general public than the nature of a theory and its relationship to hypotheses. An important principle of the nature of scientific theory is that it is dynamic. Although the basic concept may remain the same, many details of the theory will change as new problems are formulated and tested.

An example of how a theory changes is found in the theory of evolution. The basic concept of biological change through time is essentially the same today as it was when it was first formulated. Darwin's original concept of how this change took place is summarized in the phrase "survival of the fittest." In Darwin's theory of organic evolution, only those animals best suited to their environmental niche would be able to survive long enough to reproduce. Darwin's concept has been shown to be too simplistic in view of what is known today about genetics and ecology. Modern concepts of organic evolution postulate that those animals best adapted to their total environment will tend to produce more offspring. Since these offspring will tend to be like their better-adapted parents, the species will become increasingly better adapted to its environment.

We need not debate the various aspects of the theory of evolution for purposes of this paper. I have used it to illustrate the fact that scientific theories do change. However, the general public tends to overemphasize the tentative nature of theories. Ideally, by the time a theory is developed, there should exist many proven hypotheses that support the theory. To the scientist, the tentative nature of a theory is in its susceptibility to rather subtle changes, not in its basic validity.

The final point on scientific methods that I would like to stress is the relationship between scientists. Although it can be said that scientists are individualistic, there is a strong sense of collegueship between them. Current scientific knowledge has expanded to the point that specialization is required if one is to remain competent in scientific research. Holding a doctor of philosophy degree in one area, however, does not automatically qualify a scientist to speak or write authoritatively in another. This fact has made it necessary for scientists to collaborate with each other in team research.

Society has a great deal of respect for science and scientists because of the visible successes of science. However, the tendency to assume that science can address itself with favorable results to any problem is most unrealistic, of course. Occasionally scientists themselves are caught up in this popular notion and attempt to make statements on subjects for which they have little background or insight. A scientist should always be cautious about making statements on subjects outside his area of competence.

#### THE IMPLICATIONS FOR DIALOGUE

In contrast to the typical scientist, the orthodox Adventist does not treat natural phenomena on the basis of materiality.

One of my most memorable experiences illustrating this basic difference occurred in the winter of 1960 while my wife and I were living in Syracuse, New York. During the first portion of our one-year stay, we lived in an apartment adjoining the landlord's home. In this region of New York, snow arrives in October and covers the ground for six or seven months. Under these circumstances any signs of plant life are welcome. So, when the landlady invited us to see a plant that had just bloomed, we were delighted to do so.

Sunlight was streaming through the dining room window as we observed and admired her plant. In the course of our conversation the proud owner remarked on the wonderful way the flower always turned toward the sun. Now I would be the first to admit that my knowledge of botany is limited, but during my undergraduate days I had learned a few facts about photo-

tropisms. Thinking that this woman might appreciate a brief explanation of the mechanism by which the flower turns toward the light, I explained that growth of plant stem cells on the light side is inhibited by the sun, whereas growth of cells on the shady side is not. Thus the faster growth of the cells on the shady side of the stem keeps the flower facing the light. I was totally unprepared for her reaction. Looking at me as if I were the devil incarnate, she sternly informed me, "God did it."

As a physical anthropologist I have encountered this type of thinking on several occasions since, but no other experience has brought into sharper focus the basic difference between science and religion. Let me emphasize that I do not criticize this religious approach to the interpretation of biological phenomena. But the experience does contain, at a very simple level, the essentials of the conflict between the thought patterns of a person whose education and mental outlook are scientific and those of a person for whom a simple faith in God provides the necessary and sufficient answers for physical and biological phenomena on all levels of abstraction.

The clear indication of this experience is that the assumptions and perspectives of a scientist regarding natural phenomena basically differ from those of an individual whose observations of the same phenomena are from the perspective of a simple faith in God. In addition, depending on one's knowledge of the science, God becomes involved in nature at different levels of abstraction. For our landlady, it was almost as if God were physically bending the flower toward the sun. For a scientist, God was not directly involved. There appears to exist a whole spectrum of attitudes regarding the role of God in nature — varying from a belief that God's involvement is direct, personal, and tangible, to a concept of a God who established general laws involving the relationships between matter, with natural phenomena developing on the basis of these laws. Since at present there is little common ground between the specialist in religion and the specialist in science, there are likely to be problems in communication.

A further aspect of the dialogue between science and religion is a function of the probabilistic statements made by the scientist. In the biological sciences a scientist is expected to provide some indication of the probabilities that his conclusions will be wrong. Imagine the response of church members if the minister were to state that he thinks there is a 95 percent chance that Christ will return. Orthodox Adventism phrases its concepts in absolute statements. There is a tendency for persons whose conceptual framework is religious to view scientific statements as absolute also, without realizing that the scientist assumes a certain margin for error.

From my viewpoint as a scientist, I offer one additional observation. As I have noted earlier, the ability of scientists ranges from competent to incompetent, with most falling somewhere in between. Even the best scientists make mistakes, and their fellow scientists accept that which makes sense and reject occasional conclusions that may be incorrect. Scientists certainly would not reject the entire work of such persons.

In the religious sphere we may occasionally have situations in which an isolated statement may be incorrect. Because of the absolute framework in which religious statements are made, there is a tendency for some to say that a religious writer (particularly one considered to be inspired) either is correct in every statement or is unworthy of consideration at all. To a scientist such a conclusion is absurd. I suggest that, here, science has something to offer religion.

I have emphasized that the scientific concept of a theory is dynamic. Frequently this aspect is overlooked by those whose conceptual framework is religious. Because such persons may not have a continually growing knowledge of science, there is a tendency to misinterpretation. For example, I have read in church papers statements criticizing aspects of evolutionary theory that long ago were modified or rejected by most modern scientists. I have also read articles quoting comments by leading evolutionary biologists as criticizing various aspects of evolutionary theory. Often, the implication of such articles is that among scientists themselves there is general skepticism regarding evolutionary theory. Such is not the case. There is general agreement that through time biological change did occur. Debate centers on the *mechanism* by which this change occurred, not on *whether* it occurred. Again, the issue here is not evolutionary theory, but the misunderstandings that develop because of the different perspectives of the scientist and the theologian.

#### CHURCH RESPONSIBILITY

It may seem presumptuous and perhaps arrogant for me to offer some suggestions for relating responsibly to the science and religion dialogue. However, none of my proposals affects the basic posture of the church on any scientific issue. Such would involve matters of doctrine, on which I am poorly equipped to advise.

First, I would submit that the church should assume that there is nothing to be lost by an open and honest appraisal and review of any issue. Surely a church cannot have much confidence in the value of its beliefs if it thinks

these beliefs will be swept away by exposure to one or more scientific theories that may be in conflict with the doctrines of the church. Openness of discussion between science and religion may never resolve disagreements, but such discussion would ensure that the church will never be accused of being less than candid in dealing with problem areas.

Second, I would recommend that editors of church papers make it a policy to get opinions on all sides of issues discussed in published articles. This practice can help prevent the use of poorly conceived ideas and statements by church members to defend their beliefs. For example, there are very few statements I have read in church paper articles dealing with my area of specialization that would not have been rather thoroughly demolished by a group of knowledgeable specialists. In my opinion, discreet silence is far better than uninformed statements, no matter how noble the intentions may be.

In addition, I would recommend that editors recognize the wisdom of selecting a scientist qualified in the particular area of the issue under consideration. Asking a scientist competent in one area to discuss problems in another area is somewhat analogous to asking an auto mechanic to fix a wrist-watch. He may be able to do it, but the prospects are not good.

Finally, I would suggest that we all keep in mind that scientific methods, for all their success in solving many problems, are not methods suitable for developing a theology that involves the concept of a personal God. Belief in God is a matter of faith, not a matter of science. Despite wishes to the contrary, the complexity of nature does not prove the existence of God, unless one assumes his existence to begin with.

If I appear to have been unduly critical of the religious sphere of thought and overly charitable of the scientific, it is because I am a scientist. My obvious bias, notwithstanding, I hope I have contributed here to a clearer conception of the thought processes and methods of the scientist and how they may differ from those of the nonscientist. In the dialogue between science and religion we must concern ourselves not only with the explicit challenges created by rapidly expanding scientific knowledge, but also with the basic differences that can compound existing misunderstandings.

#### REFERENCE

- 1 George G. Simpson, *The Meaning of Evolution* (New Haven: Yale University Press 1949), p. 5.