



Ariel A. Roth



Dr. Ariel A. Roth was born in Geneva, Switzerland, and grew up in Europe, the Caribbean and North America. Holding a Ph.D. degree in zoology from the University of Michigan, he has been chairman of the Biology Departments at Andrews and Loma Linda Universities, and from 1980 to 1994 was director of the Geoscience Research Institute at Loma Linda, California. For 23 years he has been editor of the journal Origins.

*Dr. Roth has been active in the evolution-creation controversy in the United States, testifying before many educational and legal groups, and has conducted numerous geological and paleontological field trips in Australia, New Zealand, Europe and North America. He has published over a hundred and fifty articles in both scientific and popular journals, and has given many hundreds of lectures throughout the world. His book *Origins: Linking Science and Scripture* presents scientific evidence that confirms the Bible.*

S *habbat Shalom:* Dr. Roth, what initially kindled your interest in creation?

Roth: Early in my childhood, I remember my father discussing the controversy between evolutionary and biblical views. Geological interpretations were very important as they related to the Genesis flood and the proposed long geologic ages for the rocks. Especially significant was the question of whether we as human beings had descended from ape-like creatures as proposed by evolution, or whether we were created in God's image as depicted in the Bible. My interest increased dramatically when, as a graduate student, so many of my science classes emphasized evolution as the only reasonable alternative, and some of my profes-

sors expressed concern about my views.

Shabbat Shalom: Is creation a relevant topic today in the twenty-first century? Why?

Roth: The concept of creation is sometimes dismissed as archaic and irrelevant. But this is not the thinking of many. A 1997 Gallup poll of adults in the United States indicates that only 10% believe that humans originated by a purely evolutionary process; 39% believed that God guided in a process of development over millions of years; while 44% believed that God created humans in the last 10,000 years. The question of our origin has profound implications regarding the meaning of life, our purpose, duty, and our ultimate destiny. These are not questions that we can dismiss now any more easily than we

could fifty or one hundred years ago. In 1916, 40% of scientists

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indicated that they believed in a personal God that answers prayer. A similar survey in 1996 indicated that about 40% of scientists still believed in a personal God that answers prayer. There has not been much change over the last century. While many scientists believe in God, the concept of God is excluded from current scientific explanations. To include God is considered unscientific. The great controversy between science and the Bible that started two centuries ago still rages in 2000 C.E.

Shabbat Shalom: Why is creation important in Christian tradition? What role does creation play?

Roth: One of the things we humans puzzle about is how the natural world that we see all about us came to be. The Bible tells us that God was involved in the original creation of the world and the things we find therein. We are not left in the dark about this, although we do not have all the details we would like. If God is the Creator of the universe, this establishes His authority above all others. None is greater, and that greatness commands its due respect.

Shabbat Shalom: How different is the Jewish understanding

of creation from the Christian understanding of creation?

Roth: In general there is remarkable similarity. The only major difference is that Christianity includes Christ as creator. This is supported by some passages of the New Testament of the Bible. Both Judaism and Christianity entertain a variety of interpretations about creation, but when it comes to the inspired accounts of God's creative acts in the beginning, there is little difference. At the beginning of both the Jewish Torah and the Christian Bible we have the same account of creation in the book of Genesis. In that account God prepares the Earth and creates the various forms of life in six days and rests on the seventh day, the Sabbath.

Some, in attempting to reconcile evolutionary views with the Torah or the Bible, have proposed views of the gradual development of life forms by God over

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millions or billions of years. One model called *theistic evolution* suggests that God used the evolutionary process and He helped whenever evolution had major problems. Another model called *progressive creation* proposes that God gradually created more advanced forms of life during many creation episodes spread over

many millions of years. Both these models face serious scientific and theological problems.

Shabbat Shalom: It appears that Christian tradition has emphasized salvation at the expense of creation whereas Jewish tradition has emphasized the value of creation. Do you have any comments on this antithesis?

Roth: Tradition is important but varies with time and place. I personally appreciate any emphasis that the Jewish tradition places on creation since this has been my area of special interest. On the other hand, life is so meaningful to us, that I suspect that salvation is probably a more important question.

Shabbat Shalom: What are the practical implications of the biblical idea of creation?

Roth: The Bible tells us that God created in six days. Then He rested on the seventh day. He asked humans to keep the seventh day holy as a memorial of His creatorship and His creation. The biblical creation week implies the keeping of the holy Sabbath as a memorial of that creation. This Sabbath-keeping is a help to people to keep them from forgetting their Creator.

Scholars who suggest that creation took a very long time propose that the account given in Genesis is mythology and not history. However, later on that part of the Bible that is accepted as historical also speaks of God's creating in six days. Probably the most authoritative part of the Bible and the Torah is the Ten Commandments, given after the exodus of the Children of Israel from Egypt. These commandments were written by God's own hand, and there in Exodus 20:11 He asks us to keep the Sabbath holy because He created in six days. It would be a strange kind

of God who would create over millions of years and then ask us to keep the seventh-day Sabbath holy because He created in six days. Furthermore, other leading biblical authorities including Peter, Paul, and Christ consider the account of beginnings given in the Bible to be factual. I think of passages like 2 Peter 3:3-6, Romans 5:12-14 or Matthew 19:4-6.

Shabbat Shalom: What does the Christian faith in creation imply for a Christian understanding of God, humans, and life?

Roth: Let me start answering by asking some different questions. Why are we here on Earth? What is the meaning of existence? It is hard to think that the meaningfulness of our existence is just an accident. These deep questions find satisfying and valid answers in the context of creation. The Bible and the Torah tell us that God is the Creator. We are also told that we were created in God's image, and this implies a special relationship. On the one hand, we are responsible to God our Creator. On the other hand, we are special and God is doing all He can to help us in the great conflict between good and evil. Thus creation provides reasonable and meaningful answers to questions about our origin and purpose.

Shabbat Shalom: If you could single out the most meaningful lesson of the creation story in Genesis, what would it be?

Roth: The most important lesson we can learn from cre-

ation is that God is in charge. While He gives us the power of choice, including freedom to choose good and evil, it is good to know that our powerful and good Creator is in ultimate control. This means that since He was powerful enough to create us, He is powerful enough to recreate us now and in the life to come.

Shabbat Shalom: Do you think that creation really happened? If yes, how?

Roth: Yes, I think creation really happened. The universe is too marvelous, life is far too complex, and our existence too meaningful, for me to think that there is not some mastermind behind it all. Furthermore, I would expect that any creator who designed our minds would communicate with his creatures. As I look at the various possibilities for that communication, the Bible seems the most reasonable. Many historical, archaeological, and scientific facts—yes I said scientific facts—authenticate the Bible. In that Bible I find that God is the Creator of all. Many details of how He did it are not given, but He is such a powerful Creator that it did not take Him long to do it.

Shabbat Shalom: In your recent book *Origins* you attempt to link science and Scripture, and in the process you propose the biblical model of a recent creation by God. So when did creation take place in history?

Roth: Both the Bible and the Torah suggest that the creation of life on Earth took place a few

thousand years ago. No specific exact time is given, and the genealogies and various manuscripts permit different interpretations, but these documents are not talking about millions of years. We are probably speaking of around 6,000 to 10,000 years ago.

This immediately raises the question about the current scientific interpretations that life has been evolving on Earth for billions of years. Which is correct: science or the Bible? There is not very much scientific data that points to only a few thousand years since creation, but it is impressive that the firm evidence for humans on Earth suggests only a few thousand years of existence. I am speaking of the findings of archaeology, history and written languages. These all suggest only a few thousand years. If humans have been around for at least half a million years as proposed by many anthropologists, where are all the ancient cities and other evidences such as cemeteries or burial places for the vast population that would have developed over half a million years? Our rare examples about ancient fossil man are often disputed, but recent archaeological and historical findings about recent man are abundant and unquestionably human.

There are several geologic processes that are so fast that they severely challenge the concept of the billions of years proposed for the evolution of life-forms on Earth. For instance, the rate of erosion of our continents goes on so rapidly that in the proposed eons of geologic time they would have been eroded to sea level over 100 times, but they are still here. The suggestion by some geologists that the continents have been renewed from below to re-

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place the eroded portions is not an answer, because many of the proposed young to old layers are still right here on the continents. We have not gone through even one complete cycle of erosion and replacement.

Another significant feature that challenges long ages for the geologic layers of the crust of the Earth is that these layers seem very flat as they lie one on top of the other. In contrast, the present surface of the Earth is well carved by irregular erosion forming gullies, valleys and canyons. If there had been lots of time in the past, we would expect the same irregularities of erosion in the older layers. We would especially expect this where major parts of the layers are missing. Sometimes hundreds of millions of years are postulated by geologists to be missing between layers. Yet when we look at those layers we see virtually no erosion during those assumed immense time periods. It looks more like these layers were laid down rapidly during the Genesis flood (see *Figure 1*).

In the great question about the age of the geologic layers it is helpful to note that the worldwide flood described in Genesis is crucial to the biblical concept of a recent creation. The great Genesis flood is the cause of the geologic layers; and the fascinating fossils we find in them represent organisms that perished in that event.

Shabbat Shalom: What correspondence between science and Scripture is for you most breathtaking?

Roth: I personally get most interested in the evidence found in the geologic layers. This is crucial to the question of a recent creation versus a long evolution-

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ary process. It is of interest that in the last decades there has been a major philosophical breakthrough in geologic thinking towards major catastrophic interpretations. Geologists used to think only in terms of slow, gradual changes. That has changed. Major rapid catastrophic changes are now ac-

cepted as a normal part of Earth's history. The proposed impact of a large meteor that caused the death of dinosaurs is an example. Geologists are not turning to the biblical model of Earth's history, but many of their new rapid catastrophic interpretations fit nicely with the biblical model of the Genesis flood as the major geologic event since the creation of life.

Shabbat Shalom: What would you regard as the most important scientific arguments against evolution?

Roth: Probably the most baffling problem evolution faces is the question of the origin of life. It turns out that the simplest form of independent life that we know of is extremely complex.



View of the Grand Canyon of the Colorado River in Arizona. The arrows from top to bottom point to three assumed gaps (missing layers) of about 6, 14, and 100 million years. One would expect a lot of irregular erosion during these long periods of time, but the contacts at these gaps are neatly flat, indicating that these long periods of time did not take place.

Figure 1

How could many thousands of delicate and complicated molecules come together at the right time and place so to form the first living organism? And after you have simple life, you then need to evolve it into more complex advanced organisms like fishes and orchids. Almost all biological systems are complex, consisting of many interdependent parts. However, the search for an evolutionary mechanism that would produce complex systems has been futile. Darwin's idea of natural selection actually interferes with the gradual development of complexity. Of course, there are a number of other important arguments. If evolution is for real, why don't we see newly evolving organs? Evolution proposes that life developed over billions of years. But when mathematically evaluated, these billions of years are far too short for the highly improbable events postulated. Further, it appears that geologic events such as erosion proceed much faster than can be accounted for over the eons of proposed time. Another serious problem is the almost total absence of fossil evolutionary intermediates between major kinds of organisms. Many scientists who do not believe in the biblical account of creation have

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written books criticizing the evolutionary model. Evolution remains scientifically undemonstrated. There is good science and there is bad science. In evolutionary theory, it is sometimes hard to find good science.

Shabbat Shalom: Do you think that creation excludes evolution?

Roth: The word evolution means many different things. If you think of the usual meaning, which is the gradual development of life from simple to complex over eons of time (macroevolution), then creation by God in six days as described in the Bible cannot be reconciled with evolution. On the other hand, if by evolution you mean only the small changes we see in succeeding generations of living organisms, as some germs show when they adjust to various antibiotics (microevolution), then this type of evolution easily fits with creation. In a creation context this limited variability is interpreted as a degree of adaptability created by God so as to permit organisms to adjust and survive under varied conditions. Under these circumstances creation does not exclude the microevolutionary type of evolution.

Shabbat Shalom: Do biologists and other scientists still regard it to be “the ultimate scientific sin” to involve purpose and design in questions about origins?

Roth: At present science is not adopting the concept of some kind of purpose or meaning to existence into its explanatory menu. Many scientists feel that these concepts are not part of sci-

ence. To include them is to be unscientific. During the past century science has taken a rather strong *naturalistic* stance. This stance excludes God as a valid explanatory factor in science. This attitude has profound implications for both the questions and the answers science will come up with. More seriously it has pro-

found implications about whether or not science can arrive at truth, especially the truth about whether there is any meaning to human existence. Furthermore, if

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God does exist, science will never find Him as long as it insists on excluding Him from any acceptable explanations. Science would not be facing the apparently insurmountable problems evolution now faces, if it allowed for alternatives such as creation. Evolution is the best model science can come up with for the origin of life-forms as it tries to stay within the confines of a purely naturalistic philosophy; but it falls far short of scientific plausibility in spite of the claims of many evolutionists to the contrary. Evolution may turn out to be the greatest intellectual delusion of all time.

Shabbat Shalom: Does the biblical story of creation in Genesis 1 have something to say about the scientific process of creation?

Roth: Some, in attempting to resolve the conflict between scientific evolutionary interpretations and the Bible, suggest that the Bible is not a textbook of science. The implication is that the Genesis account of beginnings is not a factual account. It is true that the Bible is not a textbook of science; it is much more than that, but this does not mean that the Bible does not give factual information. The Bible provides all kinds of information about history, geography, culture, and also some scien-

tific insights. When the Genesis account refers to God's separating the land from the waters during creation week, this is information

that they were discovering the scientific principles that God had established in nature. During their time science flourished, il-

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about nature that fits into our common understanding of science. When the days of creation are described as each having an evening and a morning, this is scientific data that helps authenticate them as ordinary days and not as long extended periods of time. Furthermore the Genesis account is presented as a factual account. It is not presented as a parable, allegory or fable. There is scientific information in the creation account.

Shabbat Shalom: Is a short time period of creation—say one week as in Genesis 1—a possible option in science today?

Roth: The present scientific attitude that excludes God from scientific explanations would dictate that creation in one week is not a

lustrating how science and creation are compatible.

There is some hope that science may be broadening its restricted outlook. In the past few years there have been suggestions of a significant shift in thinking away from the exclusiveness of science as now practiced. Leading thought leaders, including Nobel laureates, have been meeting in various conferences and discussing the question of whether scientific explanations that exclude God are sufficient. A number of books are being published on the topics of design and a designer for nature. Added to this is the beginning of a realization by the scientific community that the

strongest evidence for creation. Even the simplest of organisms has all kinds of very complex molecules that work together to carry on the life processes. When you look at more advanced organisms it is the same story at a different level. In our brains there are some 100 trillion connections between the nerve cells. It is very hard for me to think that all this complexity just happened to get put together by random action. It looks like there must be a Creator behind all this.

Shabbat Shalom: Would you like to share with our readers one of your personal experiences when you have felt the creative power of God in your life?

Roth: I can recall a few years ago in the Bahamas when I had wrenched my back while lifting equipment over the edge of a boat. I lay in bed with severe pain and was hardly able to move. For me, this was not at all a time to be incapacitated. Two of my companions and I were planning a research project under the sponsorship of the United States National Oceanic and Atmospheric Administration to test the rate of coral growth. We were scheduled to take an underwater diving test the next morning. That test would determine if we could go and live for several days in the ocean down in an underwater laboratory. In my pain and desperation I prayed earnestly to God for help. I felt a tingling sensation in my back and was healed instantly. I got up and quickly told my companions that I was healed. We went on to pursue the research, I with special gratitude to God for His creative power and His love and mercy towards us weak human beings.

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scientific option. This does not mean that creation week did not take place. It means that science has placed itself in a restricted mode that cannot accept such an option. On the other hand, if you define science as an open search for truth about nature that allows the possibility of a Creator God, then creation by God becomes a scientific possibility.

It is of interest that the pioneers of modern science did not adopt the current restricted view of science that excludes God. Leaders such as Kepler, Boyle, Newton, Pascal, and Linné believed in God as Creator and felt

majority of the population is not following them down their exclusively naturalistic evolutionary pathway. Scientists are beginning to realize that there is a strong grassroots movement in favor of teaching some creation along with evolution in the public schools throughout the United States. The public favors teaching both so as to give the students the option of evaluating both concepts.

Shabbat Shalom: What of creation impresses you most?

Roth: The complexity of biological systems is almost beyond belief, and to me represents the