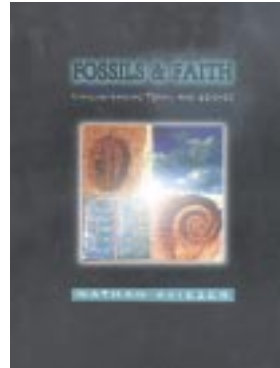


Fossils and Faith: Understanding Torah and Science

By Nathan Aviezer



Ktav Publishing House
New Jersey, 2002
270 pages
Reviewed by Cyril Domb

The last few decades have witnessed a staggering growth in scientific knowledge in the established sciences like physics, chemistry and biology. In addition, new disciplines including cosmology, computer science, evolutionary biology, molecular genetics, chaos theory, complexity theory and a dozen other branches of study that were unknown a half-century ago have emerged and now occupy a central place in the scientific landscape. Our universe has turned out to be far more fascinating and challenging than envisaged by even the most imaginative thinkers of the previous generation.

The effect of this new scientific information on the status of religion has been dramatic. Previously, it was

Professor Domb is professor emeritus of physics at Bar-Ilan University. He has written widely on the subject of Torah and science.

unheard of for a scientific society to hold a discussion on science and religion. Nowadays, not only do such discussions take place regularly, but they command large audiences. A few years ago, at the annual meeting of the American Association for the Advancement of Science, the highlight was a public debate between Steven Weinberg, a secular Jewish Nobel laureate in physics, and John Polkinghorne, a distinguished particle physicist and deeply religious Christian, who had become a priest a few years earlier. The subject of the debate was evidence of design and purpose in the universe. Similarly, some years ago, the Royal Society of Britain, whose former fellows include Newton and Darwin, held a public lecture entitled “Cosmology—Room for a Creator?”; seats had to be reserved in advance, and the lecture hall was filled to capacity.

A few years ago I was invited to participate in a project called “Science and the Spiritual Quest.” Sponsored by the Templeton Foundation, the project aimed at finding common ground in science and the monotheistic faiths. What impressed me most, however, was the caliber of the participating physicists, astrophysicists, biologists and computer scientists. The project ended with a highly successful international conference, which was held at the University of California’s Berkeley campus and was widely reported in the general and scientific press; *Newsweek’s* cover exclaimed, “Science Finds God.”

Nathan Aviezer, a distinguished professor of physics at Bar-Ilan University, was one of the first to appreciate the importance of the new scientific developments to the Torah-intellectual; he devoted a sabbatical year to learning the scientific disciplines relevant to

Creation, as explained in the first chapter of Bereishit. To his surprise, he found that significant changes had taken place, as a result of which the current scientific description fits well with the Torah account. The book that he wrote subsequently, *In the Beginning*, rapidly became a best seller and has been translated into nine languages. In his second book, *Fossils and Faith*, Aviezer relates a wide variety of new topics in the area of Torah and science to the present scientific consensus.

Three factors characterize Aviezer’s approach:

A. Every attempt should be made to understand a Torah text literally—only if a conflict arises with *well-based* scientific ideas should one resort to a non-literal interpretation. This is in accordance with the view of Rambam, whom Aviezer regards as a role model.

B. In obtaining scientific information Aviezer makes use only of primary authoritative sources and not of the popular surveys that fill the bookshops nowadays. He is an avid reader of *Scientific American* (and I cannot think of a more reliable reference source). For earlier developments he has made a great effort to identify the most trustworthy texts available, and the references to these texts at the end of each chapter are an additional benefit to any reader.

C. When quoting scientists on current scientific thinking, Aviezer only uses secular writers to avoid any suggestion of religious bias.

The book consists of nineteen chapters, divided into three subheadings—“Faith,” “On Science and the Bible” and “Fossils.” The chapters are self-contained and can be read in any order. The opening chapter, “Faith and the Era of Science,” demonstrates the importance of plausibility arguments both in science and in religion and

provides convincing evidence that the concept of *creatio ex nihilo* has been accepted by a substantial number of eminent scientists. Particularly interesting is the view of John Wheeler, a distinguished Princeton theoretical physicist, that “the laws of nature came into existence together with the Big Bang, as surely as did space and time.”

Several of the chapters amplify topics discussed in Aviezer’s first book on Bereishit. These chapters contain new material of interest, and particular attention should be paid to the chapter called “The Anthropic Principle,” in which the author defends one of his crucial arguments against the criticism of Professor Raphael Falk, a geneticist at The Hebrew University of Jerusalem. The latter, a rabid secularist, published a ten-page journal article devoted solely to attacking Aviezer personally and denigrating his writings.

In the past few decades, many scientists have become aware that the universe seems to have been specifically designed for the existence and the well being of man. A remarkable series of coincidences has been discovered without which it would have been impossible for life to exist. The nuclear forces are just the right strength for the sun to function appropriately; the earth is located at just the right distance from the sun for there to be water, an atmosphere and other life essentials, and a collision of the earth with a giant meteor took place some sixty million years ago to eliminate the dinosaurs and allow mammals to develop, et cetera. Religious scientists argue that the probability of such a series of events occurring by chance is negligible, rather it demonstrates convincing evidence of the hand of the Creator.

Falk challenged the probabilistic basis of this argument (as others have done before him) as follows:

According to Aviezer’s logic, the probability that I am writing these lines with a dull yellow pencil, using my left hand, sitting at my kitchen table, on the third floor of a specific Jerusalem address—this probability is completely negligible. Nevertheless, all these events happened and they clear-

ly mean nothing.

In a brilliant refutation of this argument, Aviezer takes guidance from Nobel laureate Richard Feynman, one of the outstanding physicists of the twentieth century, on how to define and calculate the probability of an event. In doing so, Aviezer shows clearly that the events described by Falk are everyday occurrences, whereas the coincidences of the anthropic principle are truly rare events that legitimately cause surprise.

As a result of the anthropic principle and other remarkable scientific discoveries, many secular scientists have come to accept the existence of a Creator. But this does not make them religious in the spirit of the monotheistic faiths. Most secular scientists do not believe in Divine Providence and do not consider that prayer, another characteristic of religious life, can play

Aviezer breaks new ground in attempting to scientifically identify the “man” created by God in Genesis.

any part in human affairs.

But for the observant Jew, prayer and Divine Providence are key features of religious life. Aviezer begins his discussion of prayer by querying the purpose of prayer in Jewish tradition, in particular those prayers in which we ask God to grant our physical and spiritual needs. It is clear that God has no need for our prayers, and Aviezer develops the thesis that the aim of prayer is to emphasize *to ourselves* our dependence upon Divine Providence and to elevate ourselves spiritually so that we become worthy of Divine blessings.¹ Using well-chosen examples, Aviezer demonstrates that God expects us to make the maximum use of our abilities in meeting the problems of life before we turn to Him. Aviezer also warns us to treat with great caution any publication claiming to show statistical evidence that prayer improves the health of seriously ill patients.

Aviezer breaks new ground in attempting to scientifically identify the “man” created by God in Genesis. He

argues that the man in question cannot be an early hominid *Homo sapiens* of the biologist or a Neanderthal man, since these “men” do not fit the Genesis description either temporally or qualitatively. Although there are no significant physical differences between modern man and Neanderthal man, and the average brain size is the same for the two species, there is a quantum gap between the utter primitiveness of Neanderthal culture and that of modern man.

Aviezer focuses attention instead on the remarkable Neolithic Revolution, which took place some 10,000 years ago and included cultural innovations such as agriculture, animal husbandry, metal working, the wheel, the first written language, ceramic pottery, weaving, prepared foods (bread, wine, cheese, butter), musical instruments and advanced architecture. The first cities date back to this period as well. To archaeologists and anthropologists, the cause of the Revolution is shrouded in mist.

In the Genesis description, Seforno points out (Genesis 1:26) that the word “man” in the first chapter refers to “the species of living creatures known as man,” (Aviezer calls this the Genesis man), whereas the specific person named Adam is not mentioned until the second chapter. By identifying Genesis man with the Neolithic Revolution, Aviezer disposes of the difficulty of the multimillion-year history of prehistoric man, which is seen to be irrelevant. Our own 6,000-year calendar starts from the second chapter with the creation of Adam.

The author also addresses recent scientific literature on aging. A revolutionary concept emerges: The human body does not wear out in the way that a car or washing machine wears out after years of faithful service; rather the diseases that usually terminate human life arise from genetic defects. If the early generations in Genesis did not have these genetic defects, they would have remained young and able to sire children throughout their lives. They would not have been immortal—their lives would have terminated as a result of hazards, virulent diseases or violence.

Professor Caleb Finch, a leading expert in the field, has indicated that the average life span would have been about 1,300 years, and on this basis, the lifespan of 900-odd years recorded in Genesis is very plausible.

Aviezer suggests that at the time of Noah, the genes for aging were introduced into the human gene pool. It took several generations for these genes to propagate throughout the entire human population, and eventually the maximum life span was reduced to the divinely decreed value of 120 years. This remarkable idea offers, for the first time, a rational explanation of the enormous life span of the antediluvians and how it diminished after the Flood.

In another section, the author analyzes the literature relating to the “oldest old” (i.e., those with exceedingly long life spans) and concludes that if one merits the blessing of extremely long life, it is usually accompanied by good health!

An event of particular interest in the Book of Genesis is the incident of the Tower of Babel and the spread of languages that resulted from it. According to Genesis, these languages should fall into three groups corresponding to Shem, Cham and Japhet, the sons of Noah. Aviezer points out that if we identify Cham with Africa and Shem with Asia, the Biblical description fits in well with what linguists term the Afro-Asiatic family of languages.

But the Japhethide languages seem to present a problem since they were spoken throughout Europe and deep into Asia. The European branch extends from Greece through Germany as far as Spain, whereas the Asian branch extends from Iran and Afghanistan as far east as Pakistan. There should be a linguistic relationship between these languages, and they should show signs of having originated near Turkey some 4,000 years ago at the time of the Flood. In the eighteenth century, linguists did not support the Genesis account since they believed that there was no connection between the ancient languages of Asia and Europe.

The picture began to change at the end of the eighteenth century with the

discovery by Sir William Jones, a British Orientalist serving in India, that the ancient Indian Sanskrit language bore a close connection to Greek and Latin as well as to Gothic and Celtic. This brilliant observation triggered further studies and led to the new term, “Indo-European” languages to describe this family of languages. The ancient Anatolian language of Turkey is also a member of this group. The Japhethide languages can thus be identified with the Indo-European family.

What was the original homeland of the ancestral Indo-European language? This is a problem that has occupied generations of linguists. Aviezer quotes recent research by Cambridge Professor Colin Renfrew, leading to the conclusion that “central and eastern Anatolia [present-day Turkey] was the key area where the early form of Indo-European was spoken.”

The last few chapters of Aviezer’s book focus on researchers’ lack of objectivity concerning fossils and evolutionary biology. Aviezer writes:

One naturally assumes that the fossil evidence and its interpretation (the science of paleontology) have been presented by serious scientists who are objective in the pursuit of knowledge . . . we shall see that nothing could be further from the truth.

Aviezer backs up his assertion with three striking cases of fraud from the early twentieth century: Neanderthal man, who was falsely described as uncouth, brutish and boorish; Piltown man, a fossil that was an outright fraud, which deceived the paleontological community for forty years and Hesperopithecus, a “prehistoric man” that turned out to be nothing but a pig.

The author also shows that errors of a comparable kind have taken place quite recently in palaeoanthropology (the study of the origins of mankind). In relation to Homo sapiens, there are currently two opposing theories, each claiming to have found the correct explanation for the evolutionary history of contemporary human beings. The disturbing aspect of this controversy is summed up by Professor Erik Trinkaus, a leading scientist in the field. “What is

uncanny—and disheartening—is the way in which each side can muster the same fossil record into an utterly different synthesis for human evolution.”

The author devotes subsequent chapters to different aspects of the theory of evolution; he points out that even 150 years after the publication of Darwin’s famous book, and more than fifty years after the formulation of the synthetic theory of evolution (the synthesis of Darwin’s original ideas with modern genetics), strident arguments are still taking place within the biological community even on the most fundamental principles of evolution. After giving a number of illustrative examples Aviezer concludes, “One stands in awe at the welter of confusion and mystery that abounds in evolutionary biology.”

The chapters dealing with “Darwinian fundamentalism” and recent critical analyses of Darwinism are perhaps the most important in the book, since they provide a coherent response to a new creed of militant atheism whose adherents have become extremely vocal in the past decade or two. The following are typical quotations from three leading exponents of such atheism, which Aviezer cites:

“Religion is a dreadful disease of society, and I think that science liberates people from the world’s religions” (Peter Atkins).

“The kindly God who loves us, is, like Santa Claus, a myth of childhood, not anything that a sane, un-deluded adult could believe in” (David Dennet).

“Human vanity cherishes the absurd notion that our species is special” (Richard Dawkins).

The three scientists quoted above have prestigious academic appointments and are authors of best-selling books on evolution.

Aviezer directs his criticism at the *scientific* content of these ultra-Darwinists’ writings. He bases his discussion on the ideas of top-ranking paleontologists Niles Eldredge and Stephen Gould and Nobel Prize physicist Luis Alvarez. On the basis of detailed studies of the fossil record, Eldredge and Gould have noted that the *gradual* evolution of species as

required by Darwinian evolution does not appear to occur. Instead the fossil record typically shows that a species remains unchanged, that it is in “equilibrium” for long periods of time, and then, on rare occasions, this equilibrium is suddenly “punctuated” by an extremely rapid evolutionary change. This fact is completely ignored by the ultra-Darwinists. The punctuated equilibrium picture has been widely accepted by paleontology researchers.

Alvarez and his son, Walter, have provided a successful explanation of the mass extinction that killed all the world’s dinosaurs. They proposed that an impact between earth and a large meteor falling at a very high speed from outer space caused tremendous devastation, which led to mass extinction. Their theory made a number of predictions—all of which were verified—and has since gained wide acceptance. The idea of astronomical catastrophes is totally alien to Darwinian thinking and is not mentioned in any of the books of the ultra-Darwinists.

Aviezer concludes that the term “Darwinian fundamentalists” (first introduced by Stephen Gould) is appropriate to characterize this group of atheists since they do not differ from any other fundamentalist sect. Certainly their approach cannot be considered as scientific.

This is an outstanding book, written with lucidity and elegance, a worthy successor to *In the Beginning*. I recommend it to all who are interested in the relationship between Torah and science at the beginning of the twenty-first century. **JA**

Note

1. A sentence in this chapter is liable to misinterpretation—“the idea that prayers can somehow influence G-d . . . is utterly divorced from Jewish Tradition.” In the opinion of the reviewer, this sentence must be understood in conjunction with the succeeding sentence that God is not “a cosmic vending machine that dispenses benefits upon the insertion of appropriate spiritual tokens in the form of prayers.” There are numerous Biblical figures who prayed to God and whose prayers were answered positively and immediately.