

SUMMARIES

Genesis and the Big Bluff is a book review of *Genesis and the Big Bang*, by Dr. Gerald Schroeder. It is also a useful introduction to the Torah and science interface. It was essential for the book review to be comprehensive, so as to avoid superficiality.

This summary captures, in a nutshell, the main arguments made in *Genesis and the Big Bluff*. An attempt was made to be brief and to use straightforward language. The reader will then be able to assess the subject, and to decide whether to read the entire segment in the book review.

THE BIBLE & HEREDITY

Dr. Schroeder analyses the Biblical incident in which the Patriarch Jacob (יעקב אבינו) uses peeled wooden rods to influence the wool patterns of the sheep born in his flock. This Biblical passage was used by evolutionary biologist Ernst Mayr to argue that the Bible reflects an outdated belief about heredity, known as Lamarckism. Dr. Schroeder quotes the commentary of Rashi to argue that the peeled rods were never meant to influence the colour of the sheep's wool. But he only quotes the first part of Rashi's words, and omits the crucial part of the commentary, in which Rashi clearly states that the rods *were* supposed to influence the colour of wool of the lambs. Dr. Schroeder also ignores numerous rabbinical commentaries which served as Rashi's source.

Dr. Schroeder's point of departure is that the current, Darwinian model of heredity has completely supplanted Lamarckism. But there is much evidence to suggest that the picture is much murkier. We cite intriguing research that has resurrected the debate about heredity and suggests that some aspects of Lamarckism are indeed valid.

THE EXPANDING UNIVERSE

Chapter three of *Genesis and the Big Bang* is devoted to a comparison of modern cosmology with the Bible commentary of Nahmanides (רמב"ן), written about eight-hundred years ago. Modern cosmologists maintain that the universe is expanding, based on observations suggesting that most galaxies are moving

away from us. Dr. Schroeder claims that Nahmanides made the same argument. But Nahmanides makes no such claim at all.

Furthermore, Dr. Schroeder only addresses one element of cosmology i.e. the expansion of the universe, and yet claims that there is broad agreement between Torah sources and modern cosmology. Is the claim that two systems are in agreement valid when only one element within them has been compared? We analyse the formation of the Moon as described by modern cosmologists and by Torah sources, and examine the point at which agreement between two systems can be claimed.

THE BIBLE & ARCHAEOLOGICAL DATING

Dr. Schroeder claims that in the post-Adam period, the Biblical dating of events is in agreement with modern archaeology. To establish this, he uses an example of metalworking. Dr. Schroeder claims that Tuval-Cain, a Biblical character, is described as living in the early Bronze Age, and that the Bible's dating of this period agrees with that of modern archaeologists. But Dr. Schroeder never quotes the relevant verse in its entirety. That verse attributes to Tuval-Cain not only bronze-working, but ironworking too. This puts a spanner in the works, since, according to modern archaeology, the Iron Age began about 1200 years after the Bronze Age.

ARAMAIC AND HEBREW

Dr. Schroeder credits Onkelos, a scholar who lived about two-thousand years ago, with a brilliant cosmological insight. But this is based on a mistranslation of the words of Onkelos. The key word is *אחדות*, which Dr. Schroeder translates as *a unified order*. But *אחדות* means *very*, as shown in the dozens of instances in which it is used by Onkelos as the translation of the Hebrew word *טוב*. Thus, Onkelos translated the thirty-first verse of the Torah as *and it was very good*, not *and it was a unified order*.

ADAM & HOMINIDS

Dr. Schroeder claims that *In the time of Adam, there coexisted animals that appeared as humans in shape and also in intelligence but lacked the "image" that makes man uniquely different from other animals, being as the "image" of God*. This is supposedly

based on a statement from *Guide for the Perplexed* by Maimonides (רמב"ם). Dr. Schroeder presents this as evidence for the existence of hominids – human-like creatures without the intelligence and morality of true humans - that came before Adam, consistent with current scientific beliefs about the origins of humanity. This is based on a gross mistranslation of the words of Maimonides. In the passage in question, Maimonides does not deal with any biological phenomenon; rather, he addresses the concept of how Adam (אדם הראשון) trained and brought up his children. We show how all the classical commentaries on Maimonides, such as Abarbanel, understood the passage in question to use terms such as *human* and *demon* in the sense of *mentch* (a decent person) and *oaf*, respectively.

CONFLICTS BETWEEN THE BIBLE & SCIENCE

Dr. Schroeder makes a stunning claim about conflicts between Torah and science, and attributes it to Maimonides:

Conflicts between science and religion result from misinterpretations of the Bible.

We examine Maimonides' words to show that this is completely incorrect. In *The Guide for the Perplexed*, Maimonides argues that any (scientific) position which demolishes core Torah concepts must be rejected, even if it appears that there is evidence to support it. Furthermore, we do not reinterpret verses in figurative ways in order to avoid the contradiction between such positions and Torah concepts.

THE BIBLE & STRING THEORY

In arguing that there is broad agreement between modern physics and astronomy and the Biblical narrative, Dr. Schroeder invokes the theories known as *String Theory* and *Inflation*. On the flimsiest grounds, he associates these with Biblical verses. We first look at scientific scepticism regarding String Theory, and the distinct possibility that it will join numerous other theories as dead-ends in physics. We pose the following question: When one claims agreement between Biblical sources and a specific scientific theory, and the latter is subsequently discarded, what are the implications for those Biblical sources? Furthermore, we examine

how easy (and futile) it is to invent allusions to religious ideas from modern scientific concepts (we use Buddhism for this purpose).

GOD & EVOLUTION

Dr. Schroeder is a proponent of theistic evolution – the notion that the numerous forms of life we observe are the product of a long evolutionary process, which is somehow guided by God. We examine the evidence he presents for this claim: The alleged existence of proto-gills in human embryos, homology (similar structures found in different organisms), and the structure of the human brain.

FACT & FAITH

Dr. Schroeder consistently implies that conclusions in cosmology are definitive, while Torah claims are tentative and subjective. We refute this by examining several uncertainties within cosmology, none of which are seriously considered by Dr. Schroeder. We look briefly at the solidity of the Torah tradition in the context of scientific claims which were rejected after having been defended by the entire community of scientists. We also examine a historical attempt to determine the age of the Earth.

THE UNCHANGING NATURE OF NATURE

Dr. Schroeder is committed to the unchanging nature of Nature i.e. the notion that the laws of nature have always acted in the same way in which we observe them to act today. We examine modern evidence to the contrary, suggesting that the "constants" of nature are not necessarily constant, and that the very laws of nature may well have behaved differently early in the history of the universe to the way we observe them to behave today.

TIME DILATION & THE UNIVERSE

One of the most important claims made in *Genesis and the Big Bang* is that there is no contradiction between the currently-accepted age of the universe (about fourteen billion years) and the Torah's account of a 5770-year history of the Earth. This is based on the physical phenomenon known as *time dilation*. We examine why the extrapolation from the micro-scale of subatomic particles to the macro-scale of everyday events is not warranted.

PHILOSOPHY

Dr. Schroeder makes statements about Jewish philosophy (השקפה) which represent the views of Maimonides. He omits mention of alternative views held by giants of the calibre of Nahmanides and Ramchal.