

THE CHALLENGE OF CREATION

Judaism's Encounter With
Science, Cosmology,
And Evolution

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Sample Chapter

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Chapter Thirteen

The Day-Age Approach

The Length of a Day

Contrary to popular belief, the Jewish calendar does not begin with the creation of the world. Instead, it begins with the creation of man. The first Rosh HaShanah (new year) was a Friday, not a Sunday. Thus, the Jewish calendar dates the world as having existed for 5,766 years from the Rosh HaShanah preceding this book's publication, *plus* the six days of creation.¹

But how long is a “day”? It is clear that the word can have several different meanings. In the Torah, we find two very different definitions of the word “day” given in the same verse!

And God called the light “day,” and He called the darkness “night”;
and it was evening, and it was morning, one day.

Genesis 1:5

Here we have the term “day” first being ascribed to the hours of light, and then to one full period of both light and darkness. This already tells us that the word “day” is not as singular in definition as one might assume.

1 This is the system widely used following Talmudic times; previously, events were usually dated according to the reigning monarch or based on the time elapsed since the destruction of the Temple. The calculation of the number of years since creation is given in the Tannaic work *Seder Olam Rabbah*. It is not necessarily intended to be absolutely precise; for example, Rabbi Shimon Schwab (*Selected Speeches*, chapter 21, pp. 260-284) controversially suggested that the prophet Daniel concealed 168 years from Jewish history. Additionally, *Tsafos to Rosh HaShanah* 27a states that the world was only physically created in the month of Nissan, whereas the calendar begins six months earlier in Tishrei, which *Tsafos* explains to refer to the creation in God's “thoughts.”

Later, another verse is understood by some to give yet another definition of the word “day”:

These are the developments of the heavens and the earth when they were created, on the day that the Lord God made the earth and the heavens.

Genesis 2:4

What is the “day” on which God made the earth and the heavens? Some explain it to refer to the first day of creation;¹ others to the day following the six days of creation, when the ordinary cycle of nature commenced. But Rambam’s son Rabbeinu Avraham explains the word “day” here to refer to the six days of creation:

When it says “on the day,” it means to say, in the time encompassing the six days of the beginning, not on the first day alone... Amongst the powerful attestations that a “day” can refer to a very extensive time, is that it says in the Torah: “All the commandments that I am commanding you on this day” (Deuteronomy 8:1), and it did not intend by this to refer to commandments that He commanded them on one particular day, but rather to the entirety of commandments which He commanded them at whichever time He did so, which was over many days, months, and years.

Commentary to Genesis 2:4

Thus, we see that the term “day” can theoretically refer to more than one quantity of time. But what is its meaning in the context of the six days of creation? Simply speaking, the definition given in the Torah of one full period of light and darkness would mean a conventional day of twenty-four hours. Yet twenty-four hours is not really a definition, merely a different unit. The usual correct definition is that a day (and twenty-four hours) is the time it takes for the earth to complete one revolution upon its axis, relative to the sun. The term’s significance therefore requires the existence of the sun. But the sun was only created on the fourth day! Rabbi Dr. Eli Munk, one of the last of the distinguished scholars of pre-war German Jewry, notes the significance of this point:

The sun and stars began their function as ray-senders, observable on the earth, certainly not before the Fourth *Day*. The word “*yom*” in verse 5 cannot indicate a period of time determined by the effect of the sun on

1 Rashi and Chizkuni, commentaries ad loc.

the rotating earth... Since there is no consensus of traditional opinions about the definition of *yom* in the Seven *Days* of the Beginning, we put the word *Day* in italics.

Rabbi Eli Munk, *The Seven Days of the Beginning*, pp. 49-50

One might still consider that although the absence of the sun at the beginning mandates that the word “day” be interpreted non-literally, this only applies as long as the sun was not in existence; as soon as the sun was made on the fourth day, a normal system of counting days should take over. However, there are sources that indicate differently:

God said, “Let there be luminaries in the firmament of the heaven to separate between the day and the night...”

Genesis 1:14

“...to separate between the day and the night...”—from when the Primordial Light was concealed. But for the seven days of the Beginning, the Primordial Light and Darkness served by day and night.

Rashi (see *Midrash Bereishis Rabbah* 3:6, *Pesachim* 2a, *Chagigah* 12a)

Only at the end of creation did our system of time begin:

Until this point (the sixth day) the counting is done relative to the universe; from this point on, a different system of counting commenced...

Midrash Bereishis Rabbah 9:14

In another place, the Midrash explicitly states that the days of Creation were not ordinary days:

“And there was evening, and there was morning, one day.” This is a thousand years, which is the day of God, as it says: “For a thousand years are in Your eyes as a day” (Psalms 90:4).

Midrash Pesikta Rabbasi, Hosafah 2:1¹

Rabbi Dovid Tzvi Hoffman notes that this does not mean that the days of Creation were precisely one thousand years long:

In many places, and especially in the book of the Zohar, it is proven that the expression “day,” as it appears in the account of Creation, is not to be understood as an ordinary human day of 24 hours, but rather

1 Also *Midrash Bereishis Rabbasi* of Rabbi Moshe HaDarshan, cited by Rabbi Menachem Kasher, *Torah Sheleimah* vol. I p. 94 section 448. See his footnote for further discussion.

the intent is to the day of God, which lasts 1000 years-that is to say, a day that lasts for an undefined length of time.

Rabbi Dovid Tzvi Hoffman, Commentary to Genesis, p. 48

All this presents strong support for explaining the six days of creation as referring to six extended periods of time. The calendar begins less than six thousand years ago, but preceding it were six “days” of Creation that lasted for billions of years. The legitimacy of using this approach to resolve the conflict between science and the Jewish calendar is widely (albeit not universally) accepted. Even Rabbi Mordecai Plaut, editor of the highly conservative Bnei Brak edition of *Yated Ne’eman*, presents this view:

...We are forced to revise an unstated hypothesis, namely, that “day” is always an accurate translation for “*yom*,” as it occurs in those Biblical sentences... To point out that 5763 counts only from the beginning of human activity rather than the entire physical world would seem an alternate and independent way to resolve the discrepancies between our traditional dating and that assigned by the general scientific method... Our suggestion here is that “*yom*” is applied primarily as a measure of qualitative change... Without the presence of man, when natural processes are of a completely material nature, a much larger amount of change is necessary for it to be spoken of as a qualitative equal to a human day.

Rabbi Mordecai Plaut, *At the Center of the Universe: Essays on Western Intellectual Space*

The Issue of Shabbos

One objection raised against reinterpreting the six days as six eons is that it undermines Shabbos. This was stated by Rabbi Shimon Schwab:

Since the observance of the seventh day was commanded in order to commemorate the creation of heaven and earth in six days, it seems almost self-evident that six days of Bereishit were six normal days in the accepted sense and nothing else.

“How Old Is The Universe?” *Challenge*, p. 165

The same argument was stated by the Lubavitcher Rebbe:

...The attempt to “reinterpret” the text of the first section of Bereishis to the effect that it speaks of periods or eons, rather than ordinary days... is not only uncalled for, but it means tampering with the Mitzvah of Shabbos itself, which “balances” all the Torah. For, if one takes the words, “one day” out of their context and plain meaning, one

ipso facto abrogates the whole idea of Shabbos as the “Seventh day” stated in the same context. The whole idea of Shabbos observance is based on the clear and unequivocal statement in the Torah: “For in six *days* God made heaven and earth, and on the seventh *day* He ceased from work and rested”—*days*, not periods.

Rabbi Menachem Scheerson, *Mind Over Matter*, p. 110

Yet this argument can and has been countered:

...Others however do not feel that there is any force in this argument. The true nature of God’s creative activity during the six days and the sense in which He can be said to have “rested on the seventh day” must remain forever beyond our comprehension, whether the days are taken literally or metaphorically. It is reasonably clear that the Torah wishes to convey that the six weekdays and Shabbat correspond to some basic structures of reality, and it can make no difference to the concept of Shabbat whether God’s “activity” or “inactivity” is expressed in relation to days, *sephiroth*, or other spiritual constructs.

Rabbi Aryeh Carmell, *Challenge* p. 259

As a parable, consider the custom on Passover night to dip one’s finger in wine and spill ten drops on the table. This serves to allude to “the finger of God” that smote the Egyptians,¹ and yet Judaism defines this as an allegorical “finger” rather than a physical finger.

A similar argument is made by others for different reasons. In the Jewish calendar, Shabbos begins and ends at nightfall. On the other hand, the simple meaning of the verses in Genesis is that each started at dawn and was concluded at the *end* of the following night – “and there was evening, and there was morning, day x.” This would indicate that Shabbos ought to begin and end at dawn. While many interpret the verses differently, authorities such as Rashbam maintained the simple meaning; and yet Rashbam clearly did not believe that our observance of Shabbos begins in the morning. Rather, he held that the Shabbos of today need not correlate precisely with the Shabbos of the creation week:

(According to Rashbam,) during the days of creation, the days are counted differently from how they are counted after that.

Rabbi Dovid Tzvi Hoffman, Commentary to Genesis, p. 27

1 *Darchei Moshe*, cited in *Mishnah Berurah* 473:74.

That is to say, even though the first Shabbos began in the morning and ended at the next morning, we commemorate it weekly beginning in the evening and ending at the next evening. Here, too, we see that the significance of Shabbos is not lost even if it is not exactly the same sort of day as was the first Shabbos that it commemorates.

Objections and Difficulties

There are other objections to interpreting the six days as six eons. Some object that this explanation has no traditional basis, in that there are no classical Torah commentaries that actually explained each day to refer to billions of years.¹ We have demonstrated earlier that this does not necessarily give reason to object to an explanation. Furthermore, while there are no traditional commentaries that explain the six days to refer to precisely 15 billion years, there are certainly traditional sources that explain the days to be much longer periods than ordinary days. Still, some counter this objection by explaining that six days can simultaneously refer to six twenty-four hour periods and also to many billions of years. This is done via ingenious and controversial scientific explanations concerning the flow of time.²

But a substantial difficulty with any explanation that the six days are not six ordinary days is that the Torah does not only say that there were six days. Rather, the Torah also states that with each day “there was evening, and there was morning.” It is difficult to imagine how this phrase could be interpreted if this does not refer to 24-hour periods on planet Earth. One could perhaps argue that it refers to the “dusk” and “dawn” of eras. Yet the Torah describes the dawn of the era as occurring at the *end* of the day, not at the beginning.

A more devastating problem with these approaches is that they simply do not solve the contradictions with science. While many people are satisfied with the approach of each of the six days lasting billions of years, whether with or without the explanation of how a day can still literally be a twenty-four hour period, careful scrutiny reveals this approach to involve

1 Rabbi Aryeh Kaplan, *Immortality, Resurrection and the Age of the Universe*, p. 4.

2 Prof. Cyril Domb, *B'Or HaTorah* 4, Summer 1984, pp. 66-67; Dr. Gerald Schroeder, *Genesis and the Big Bang* and *The Science of God*.

overwhelming problems. This is because although this approach reconciles the difference between a time span of six days and a time span of fourteen billion years, the *events* of those six days cannot be correlated with the scientific account of what took place during the fourteen billion years.

This problem involves two aspects. One is that some of the creations described in Genesis do not easily correlate with any known phenomena. This is the case with the description of the creations of the second day:

And God made the firmament, and He divided between the waters that were below the firmament and the waters that were above the firmament, and it was so. And God called the firmament Heaven.

Genesis 1:7-8

It is difficult to correlate the description of the “firmament” with any known aspects of our world. It was traditionally understood to refer to a firm covering encompassing the world, but as Malbim points out, we now know that no such covering exists. Malbim claims instead that the firmament refers to the atmosphere, and others explain it to refer to outer space. But Rabbi Samson Raphael Hirsch points out that etymologically, the word for firmament, *rakia*, refers to firm matter that has been flattened out into a layer.¹ The description of the “waters above the firmament” is likewise difficult to interpret.²

The second aspect of this problem is that the sequence of events described in Genesis does not correlate with the sequence discovered by science. For example, in Genesis, the earth and water are already present on the first and second days, before the creation of the luminaries, whereas the scientific picture is that they did not appear until long after the creation of the universe, and *after* the formation of the sun and stars.³ In Genesis, the

1 Commentary to Genesis 1:6. Furthermore, Genesis 1:14 states that the luminaries were placed *in* the firmament.

2 Dr. Nathan Aviezer (*In The Beginning*, pp. 21-23) claims that it refers to the ice that exists on comets and certain planets. Yet the idea that Genesis would discuss ice in remote parts of the universe, unknown until recently, is extremely unreasonable.

3 Even according to the view that the word “earth” refers to the entire physical universe, it certainly *includes* planet Earth. Furthermore, to claim that it does not include planet Earth leads to the unreasonable result that the creation of our world, one of the most important parts of the universe, is not mentioned anywhere in the Torah.

sun, moon and stars are described as being created a day after plant life,¹ whereas the scientific evidence shows that they existed billions of years *before* plant life.² Genesis describes the birds as having been created on the fifth day, before the terrestrial animals that were created on the sixth; and yet the fossil record shows that birds only appeared *after* terrestrial animals.³ The following chart illustrates the disparities in the sequence:

The Order of Genesis Chapter One	The Order Given by Science
Day One: Heavens, earth (including water), light	14 billion years ago: Universe begins
Day Two: Firmament separating waters	4.5 billion years ago: Formation of the earth (Day One) and of the moon and sun (Day Four)
Day Three: Dry land appears; vegetation, fruit trees (Talmud: Plant life remained under the soil until the arrival of man)	500 million years ago: First fish (Day Five)
Day Four: Creation of sun, moon and stars (Talmud: Created on the first day and set in place on the fourth)	438 m.y.a.: First land plants (Day Three)
Day Five: Fish and aquatic life; birds, flying insects	434 m.y.a.: First terrestrial insects (Day Six)
Day Six: Terrestrial mammals, terrestrial insects and reptiles	400 m.y.a.: First flying insects (Day Five)
	360 m.y.a.: First trees (Day Three)
	300 m.y.a.: First terrestrial reptiles (Day Six)
	200 m.y.a.: First terrestrial mammals (Day Six)
	150 m.y.a.: First birds (Day Five)

1 According to the Talmud (*Chagigah* 12a), they were created on the first day and suspended in place on the fourth, which likewise does not concord with the scientific picture.

2 Dr. Gerald Schroeder (*The Science of God*, pp. 67, 69, 204-205) cites Ramban (to Genesis 1:12) as stating that “there was no special day assigned for the command of creating vegetation,” explaining him to mean that the creation of plant life “occurred over an extended period not limited to that day.” Yet a careful study of the full text of Ramban reveals that he means something quite different; not that there was no *single* day when it happened, but rather, that there was no day assigned that was *distinct* from the appearance of the earth.

3 Aviezer (*In The Beginning*, pp. 84-85) and Schroeder (*The Science of God*, p. 67) claim that Genesis is speaking of flying insects, not birds. However, the text speaks of *kol ohf kanaf*, “every winged flying creature”; although this can *include* winged insects, it certainly does not *exclusively* refer to them. Flying insects, when referred to in exclusion to birds, are called *sheretz ha-ohf*. In any case, explaining that the verse refers to flying insects simply raises a further problem: terrestrial insects are described in the Torah as being created later, on the sixth day, and yet science maintains that they preceded the winged insects.

There have been various ingenious attempts to make the content and sequence of Genesis concord with that of science, an approach known as “concordism.” Such efforts are, however, beset with serious difficulties, and do not maintain a viable interpretation of the text from an etymological, contextual and philological standpoint.¹

A more general objection to the current efforts at concordism, which involve the insights of twentieth-century science, is that they render the true meaning of Genesis as something only comprehensible to modern man. And yet we see that, although the Torah is binding for all generations, God presented it in a form that would be meaningful to the generation that received it. The laws of damages refer to donkeys falling in pits, not trucks ramming into cars. It is unreasonable to believe that God gave an account of Creation that mankind was completely incapable of understanding for thousands of years.

If Genesis can only be reconciled with science via obscure theories, reference to irrelevant phenomena, drastic and very difficult textual reinterpretation, and ingenious intellectual gymnastics, then it is not a very impressive scientific account. The most reasonable conclusion is that Genesis was never intended to be a scientific text to begin with, but rather something more profound instead. In the following chapters, we shall explore what that might be.

1 See the examples in the preceding footnotes. These problems were first pointed out by Thomas Henry Huxley in “The Interpreters of Genesis and the Interpreters of Nature,” *The Nineteenth Century*. See too “Genesis and Geology” in Stephen Jay Gould, *Bully for Brontosaurus* pp. 402-415 and Dr. Carl Feit, “Darwin and Drash: The Interplay of Torah and Biology,” *The Torah U-Madda Journal* (1990) II pp. 31-32. For a very extensive discussion of the problems with concordism, see Paul H. Seely, “The First Four Days of Genesis in Concordist Theory and in Biblical Context,” *PSCF* 49 pp. 85-95. In marked contrast to Aviezer and Schroeder, who respectively make the extraordinary claims that the two sequences display “complete harmony” (*Fossils and Faith*, p. 13) and “phenomenal” correlation (*The Science of God* p. 70), Dr. Andrew Goldfinger (*Thinking About Creation*, pp. 281-283) readily admits to some of the difficulties, but considers these not to provide sufficient reason to reject the concordist approach. I beg to differ, and I suggest that the reader draws his own conclusions.