

# HALACHIC AND HASHKAFIC ISSUES IN CONTEMPORARY SOCIETY

## SERIES 2: 43 - TORAH, CREATION AND THE AGE OF THE UNIVERSE

### PART 2

#### OU ISRAEL CENTER - FALL 2022

- In Part 1 we presented the apparent contradiction between the age of the universe as understood by science - around 13.8 billion years, and the Jewish year counted from creation of 5783.
- We looked briefly at the assumptions made by science in calculating the age of the universe and at the Rambam's warning about such assumptions when made by science - in his day Aristotelian cosmology.
- We then looked in some depth at one resolution, which is perhaps the most important. That the account of Creation in Bereishit is intended to convey much deeper ideas and may not be intended to be a chronology at all. We then discussed the question of non-literal readings of Chumash and suggested some ideas in calculating the limits of acceptable Orthodox theology and hashkafa on these ideas.
- In this shiur we will examine 6 more approaches presented by contemporary Orthodox thinkers.<sup>1</sup>

### A] APPROACH 2 - THE WORLD WAS MADE LOOKING OLD

- This approach accepts the scientific analysis as accurate within its own parameters, but claims that God created the world in a mature state looking billions of years old, whereas in fact it is only 5783 years old.<sup>2</sup>

1. דאמר רבי יהושע בן לוי: כל מעשה בראשית בקומתן נבראו (רש"י - והיינו 'עץ פרי'. ראוי היה לטעון פרי מיד).

ראש השנה יא.

*The Gemara states that the creation was made in a fully mature state. The tree had mature fruit and, presumably, pre-existing tree rings.*

2. וַיֵּצֵר ה' אֱלֹקִים אֶת-הָאָדָם עֶפְרָיִם מִן-הָאֲדָמָה ... עפר - ר"י בר סימון אומר 'עופר'. עולם על מליאתו נברא. אר"א בר שמעון אף חוה על מליאתה נבראת. אמר רבי יוחנן אדם וחוה כבני עשרים שנה נבראו.

בראשית רבה פרשה יד:ז

*The Midrash learns from the word 'afar' ('ofer' is a poetic expression for a young man) that Adam and Chava were created as adults aged 20.*

This argument was put by R. Avigdor Miller and the last Lubavitcher Rebbe. If Adam was created with a non-existent past, so too the universe was created with a billions of years-old non-existent past, including fossils of animals that never existed. This is also the position of R. Dovid Gottlieb<sup>3</sup>.

1. A number of books have been written by religious scientists, such as Dr. Gerald Schroeder and Dr. Natan Aviezer, who attempt to harmonize the biblical and scientific accounts. See:

- In the Beginning - Natan Aviezer (1990)
- Modern Science and Ancient Faith - Natan Aviezer (2013)
- The Science of God - Gerald Schroeder (2009)
- Fossils and Faith - Natan Aviezer (2002)
- Genesis and the Big Bang - Gerald Schroeder (1991)
- God According to God - Gerald Schroeder (2010)

See also: The Challenge of Creation - R. Natan Slifkin (2006); Torah, Chazal and Science - R. Moshe Meiselman (2013). Older but important books on these and more general issues of science and Torah include: Torah and Science - Judah Landa (1991), Torah and Science - Yehuda Levi (2006), The Seven Days of the Beginning - R. Eli Munk (1974), Challenge - R. Aryeh Carmell and Cyril Domb (1990).

2. This issue was in fact a major discussion in the 19th Century known as the Omphalos hypothesis, which asked whether Adam had a navel and was thus created with a false history. The idea was named after the title of an 1857 book, *Omphalos* by Philip Henry Gosse, in which Gosse argued that for the world to be "functional", God must have created the Earth fully formed and looking old. See [https://en.wikipedia.org/wiki/Omphalos\\_hypothesis](https://en.wikipedia.org/wiki/Omphalos_hypothesis)

3. Rabbi Gottlieb has been a senior lecturer at Ohr Someyach for decades. He received his Ph.D. in mathematical logic at Brandeis University and was a visiting Associate Professor of Philosophy at Johns Hopkins University.

3. The solution to the contradiction between the age of the earth and the universe according to science and the Jewish date of 5755 years since Creation is this: the real age of the universe is 5755 years, but it has misleading evidence of greater age. The bones, artifacts, partially decayed radium, potassium-argon, uranium, the red-shifted light from space, etc. - all of it points to a greater age which nevertheless is not true. G-d put these things in the universe and they lead many to the false conclusion of a much greater age.
- I said the evidence is misleading. Does that mean that G-d is tricking us? Not at all: He told us the truth! Only someone who [perversely] decides to ignore the statement of the Creator and rely only on what he can investigate will be lead to a false conclusion. Only to such a person is the evidence misleading. And note that this policy of creating the world looking different from its true nature is an inescapable Jewish idea. For, we recite twice every morning that G-d constantly recreates the universe, even though this is not observable.

R. Dovid Gottlieb, *The Age of the Universe*<sup>4</sup>

### Questions on this approach

- (i) Adam obviously could not be created as a new-born or indeed as an embryo. But why should God try to fool us with 'pretend' fossils? On the other hand, is there any philosophical legitimacy to the question 'why' God would do anything?
- (ii) If one sees it as a test of faith, how can this be when the fossils can be explained in other ways (see below)?
- (iii) There is a principle that the world was not created to fool us. On the contrary, we are meant to see emet through the Creation.

4. הכל ברא הקב"ה בעולמו חוץ ממידת השקר שלא ברא.

תנא דבי אליהו - אליהו זוטא פרשה ג

*Chazal state that the midda of sheker - falsehood - was not created in this world.*

- (iv) How far does this argument go?

- Did God include in creation the cave-paintings which appear to be 10,000 yrs old? Was light created on its way to earth, looking as though it had started its journey billions of years earlier?
- What about civilizations that appear to have existed between 5000 and 6000 years ago. Were these people given false memories of previous centuries? This would mean that God created false information in the minds of men even after the Creation?
- If the world was created 5783 years ago with a 'false' history, maybe the world was created 5 minutes ago to look as though it had a longer history<sup>5</sup>. Some respond to this by arguing that 5 mins is an arbitrary time-frame, but 5783 years is not arbitrary. It is based on a literal explanation of the pesukim, which is a more authentic approach.

- (v) Since there is an apparent contradiction between nature and Torah why should we accept a literalist approach to Bereishit, which is not supported by many classic sources, and be forced to take a radical non-literal approach to science which has no scientific basis? Why not assume that the science is correct and the verses of Bereishit mean something deeper? We addressed this in Part 1.

5. The difficulty is that one could use a similar argument to say that HaShem created the universe five minutes ago. There is no question that an omnipotent G-d certainly could have created us all with our memories, with all the records, and with all our histories. It is very possible to say that the world was created five minutes ago. But this weakens the above argument. If it is possible that HaShem created the world 6000 years ago, then everything is possible.
- Of course, it is an irrefutable argument. Therefore, if one feels comfortable with it, I would say all well and good. But I think that it has problems. It touches almost on intellectual dishonesty and sophism. It presents us with more problems than it answers. It seems to make all of Judaism depend on a glib argument. But there is an even more serious problem. In no place in Torah literature do we find that HaShem created the universe so that it should appear to be billions of years old. If not for current scientific discoveries, no one would have ever made such a statement based on Torah sources alone. Therefore, this approach is nothing more than apologetics.

*The Age of the Universe: A Torah True Perspective by Rabbi Aryeh Kaplan*<sup>6</sup>

4. <https://www.dovidgottlieb.com/comments/AGEOFTHEUNIVERSE.htm>

5. The 'five-minute hypothesis' is a skeptical hypothesis put by the philosopher Bertrand Russell, that proposes that the universe sprang into existence five minutes ago from nothing, with human memory and all other signs of history included. It is a commonly used example of extreme philosophical skepticism.

6. This was a lecture that Rabbi Kaplan gave to the Midwinter Conference of the Association of Orthodox Jewish Scientists on February 18, 1979. It is available in full at <https://www.simpletoremember.com/faqs/Kaplan-SimpleToRemember.com.pdf>

6. Actually, this approach was first postulated by a gentile scientist a few years before Darwin published his theory of evolution. At the time, scientists looked upon it as being a silly argument - even before Darwin. It does not seem any more convincing today.
- There is another issue that must be dealt with squarely. Many fundamentalist Christian groups have adopted the idea of creationism, a teaching based on the the literal interpretation of the Bible. Of course, since gentiles do not take the Oral Law into consideration, their approach is certain to be very different than ours. Moreover, many of their arguments have been very effectively refuted by some of the best scientific minds. That Orthodox Jews should align themselves with such groups is both dangerous and anti-Torah.

Immortality, Resurrection and the Age of the Universe, Rabbi Aryeh Kaplan p. 5

## **B] APPROACH 3 - THE WORLD LOOKS OLD BECAUSE OF THE CATAclySM OF THE FLOOD**

Some approaches, especially of 19th century writers like the Malbim and the Netziv, sought to explain fossils as a consequence of the cataclysm of the Flood. These fossils were understood to be from creatures which were alive before the flood, but were subsequently killed, and the bones fossilized under intense pressure and extreme conditions within a few years instead of millions. Some suggest that the tilt of the world's axis shifted after the Flood.

### Questions on this approach

(i) There is no scientific basis for suggesting that bones could be fossilized in a few years or that the earth shifted axis in this way. It may have been reasonable in 19th century scientific thought, but any attempt today to bridge the gap between science and creation must be based on contemporary scientific understanding.

## **C] APPROACH 4 - THE 6 'DAYS' OF CREATION RAN AT DIFFERENT SPEEDS**

This approach was adopted by Rav Shimon Schwab<sup>7</sup> (20th century Germany/America) and the Leshem (grandfather of R. Yosef Sholom Eliashiv - 19/20th century Jerusalem). It proposes that before the creation of Man on day 6 the world did not run at the same pace. In fact, although the six days of creation were indeed six 24-hour periods, the world ran at a such a speed as would take billions of years by our current reckoning. As such the world really is 5783 years old, but creation squeezed a lot into the first 6 days!

### Questions on this approach

- (i) How could everything speed up without destroying life e.g. from atoms and radiation moving at a billion times normal speed? Rav Schwab answers that the whole system was speeded up together and so could function.
- (ii) If so, when everything speeds up, there is no external fixed reference point to measure 6 'days'. Rav Schwab answers that the creation of light at the start was the fixed rising and setting of the 6 days. Everything else was accelerated within that.

## **D] APPROACH 5 - THERE WERE WORLDS PRIOR TO OUR CREATION**

This approach was adopted by Rabbi Aryeh Kaplan. It brings from classical sources to show that the present world may be 5783 years old, but there were billions of years of prior worlds before ours.

7. אר"י בר סימון 'יהי ערב' אין כתיב כאן, אלא יהי ערב. מכאן שהיה סדר זמנים קודם לכן. א"ר אבהו מלמד שהיה בורא עולמות ומחריבן, עד שברא את אלו. אמר 'דין הניין לי, יתהון לא הניין לי'. א"ר פנחס טעמיה דר' אבהו וירא אלהים את כל אשר עשה והנה טוב מאד - 'דין הניין לי, יתהון לא הניין לי'.

בראשית רבה פרשה ג:ז

'*And it was evening and it was morning*' is taken by Chazal to indicate that there were many worlds in existence prior to our world, which God subsequently destroyed.

Rabbeinu Bachya on Bereishit 1:3 states that this accounts for the reference in Chazal of the Torah existing 2000 years before the universe. Furthermore, pre-creation time is on a different scale entirely, as we see in Iyov 10:5.

7. It appears in his essay "How Old is the Universe", Challenge p. 169

8. הַכִּימִי אֶנּוּשׁ יִמְיָד אִם-שְׁנוֹתָיִךְ כִּימֵי גֵבֶר.

איוב י"ה

9. אמר רב קטינא: שית אלפי שני הוּו עלמא וחד חרוב.

סנהדרין צו.

*Chazal tell us that our world exists in a Sabbatical Cycle of 7000 years - 6000 of life and 1000 of destruction*

Sefer HaTemuna (a kabbalistic work attributed to 1st century Tanna R. Nechunia b. Hakana<sup>8</sup>) states that there is a larger Sabbatical cycle of 7 x 7000 years. According to some views, we are now in the 7th cycle, thus there were 42,000 'years' before our world came into being. Rav Yitzchak ben Shmuel of Akko (12th century kabbalist) states that all pre-creation years are Divine 'years'. How long is a Divine 'year'?

10. כִּי אֶלֶף שָׁנִים בְּעֵינֶיךָ כְּיוֹם אֶתְמוּל כִּי יַעֲבֹר וְאַשְׁמוּרָה בְּלִילָה.

תהלים פרק צ"ד

*A verse in Tehillim states that one day to God is like 1,000 years to us. Thus the mekubalim explain that since our year is 365.25 days, each Divine year is  $1000 \times 365.25 = 365,250$  years.*<sup>9</sup>

Rabbi Aryeh Kaplan suggests that if this idea is connected with the 42,000 Divine years of the Sabbatical Cycle, it emerges that our world is  $42,000 \times 365,250$  years old - i.e. 15,340,500,000 - around 15 billion, which is roughly the age suggested by science.

• Another similar approach looks at the 974 generations that Chazal say existed before Adam, as follows:

$974 \text{ generations} \times 40 \text{ years/generation} \times 365 \text{ days/year} \times 1000 \text{ human years/divine day} = 14.2 \text{ billion years.}$

11. I am sure that many will find this highly controversial. However it is important know that this opinion exists in our classical literature; moreover that one of the most important kabbalists of 7 centuries ago calculated the age of the universe and came to the same conclusion as modern science.

Rabbi Aryeh Kaplan - *Immortality, Resurrection and the Age of the Universe* pp. 9-10

The general approach, if not the kabbalistic calculations, that dinosaurs are remnants of past destroyed worlds is also supported by the Tiferet Yisrael - Rav Yisrael Lifschitz (1782-1860)<sup>10</sup> and Rav S.R. Hirsch.

### Questions on this approach

(i) R. Yitzchak of Akko, who calculates the Divine Years, does not actually agree that we are in the seventh Sabbatical cycle but the second! So the calculation of 15 billion only works by mixing different opinions in ways which may not be legitimate. Nevertheless, other kabbalistic sources do understand that we are in a later cycle and learn the Sefer HaTemuna in this way.

(ii) The concept of Sabbatical Cycles is not accepted by all kabbalists.

(iii) The Netziv (Haemek Davar Bereishit 7:23) points out that Chazal state that these prior world were destroyed - so how could traces remain in dinosaur bones?

(iv) R. Dovid Tzvi Hoffman (19th century/ 20th century Germany) objects on the grounds that, according to this theory, the billions of years happened before our creation. Then there were 6 cataclysmic days (of creation and destruction) when all the event of Ma'aseh Bereishit happened, followed by 5783 normal years. There is no scientific evidence for any such cataclysm.

12. However, what we can't understand we rely on our faith. It is obvious that man's thoughts are not comparable to G-d's in the ability to understand Nature. Similarly, we acknowledge that we can't comprehend or adequately explain G-d's ways concerning good and evil in each generation. In these issues we simply rely on our faith in G-d's greatness. In contrast, they prefer to explain that man is the product of millions of years of development. As evidence they cite what appear to be ancient bone fragments that have been discovered in Madagascar and other places. Their evidence is total nonsense since prior to the Flood man lived for a thousand years. This difference in what was normal growth and development makes the bones appear as if they were a million years old. With this type of shaky evidence they want to refute the words of our Sages and undermine the faith that exists amongst the Jewish people.

8. Sefer HaTemuna is cited by the Ramban and other Rishonim and Acharonim. See, for instance, Beit Yosef OC 36 on the structure of the Hebrew letters.

9. R. Kaplan deals with this at length in his lecture.

10. The Tiferet Yisrael addresses this in his essay Drush Or HaChayim, which is found at the back of the Yachin U'Boaz on Mishna Sanhedrin. This is still controversial in some communities. Most people assume that it was written as apologetics to Darwin's theories, not realizing that it was first published in 1834, long before Darwin published. This Drush was so controversial that it is omitted in many editions of the Yachin U'Boaz Mishnayot, which normally contains it. Rabbi Kaplan writes that, on more than one occasion, he wanted to show someone something in this Drush, only to find that it had been ripped out of the book! Because of this, some Chassidic groups do not learn Tiferet Yisrael today.

Their main concern is to shake the faith in G-d - which has been accepted by us generation after generation. They want to replace this faith with the acceptance that events are determined primarily by the laws of nature .... Scientists - even those who are described as religious - are ashamed that we don't agree with the views of leading scientists that man is descended from the apes. They rush to find isolated statements of our Sages, rabbis and commentaries that seem consistent with contemporary scientific view ... Therefore they use misleading and distorted citations from Torah literature to claim justification for such scientific beliefs in the words of the Sages.

**Letter of Rav Moshe Sternbuch on the Relationship of Science to Torah - Jan 2005**

*Rav Moshe Sternbuch objects to the use of such sources and sees their application as highly questionable. He argues:*  
 (i) *the scientific evidence for the theory proposed is shaky and thus it is not appropriate to try to fit the Torah into science which will almost certainly change in the future. (This argument will be stronger in some cases than in others - for example the statements 'man evolved from a single-celled organism'; 'the universe is older than 6000 years'; and 'the world is round and not flat' have quite different levels of scientific certainty.)*  
 (ii) *there is a scientific agenda (Rav Sternbuch doesn't say if this is conscious or not) which is essentially anti-religious.*  
 (iii) *attempts by other Rabbis to fit Torah in with science are distortions of the true Torah view.*

13. Another approach is that which many Chassidim have. They say, "What do scientists know? Do they know what's happening? Do they know what's going on? They're a bunch of phonies, a bunch of bluffers, a bunch of stupidniks! Do they really have a way of finding out the truth? ..... But, I think to somebody who knows what science is, this is a very unsatisfactory approach. We have some idea of what is involved in paleontology. We have some idea what is involved in geology and in radioactive dating. We have some idea of what is involved in astronomy. .... So I would say that if someone feels that science is ignorant and false, all well and good. Many people prefer not to accept science as a worthy challenge. But I think that for many of us here, such an approach would be totally unsatisfying.

The Age of the Universe: A Torah True Perspective by Rabbi Aryeh Kaplan

## **E] APPROACH 6 - THE 6 'DAYS' ARE REALLY MUCH LONGER PERIODS**

When the Torah says 'days' could it mean longer periods, even billions of years?

14. ודע, כי הימים הנזכרים במעשה בראשית היו בצריחת השמים והארץ ימים ממש, מחוזרים משעות ורגעים, והיו ששה כששת ימי המעשה, כפשוטו של מקרא. ובפנימיות הענין יקראו 'ימים' הספירות האולות מעליון .... והפירוש צסדור הכתובים צזה נשגב ונעלם, ודעתינו צו פחות מטפה מן היס הגדול!

רמב"ן בראשית א:ג

*The Ramban states that, on a pshat basis, the 6 days of creation are actual days. However, on a deeper kabbalistic level the expression 'yamim' represents the Sefirot. The true explanation of these verses in Bereishit is deeper than we can possibly imagine!*

15. ויקרא אלקים לאור יום ולחשך קרא לילה ויהי ערב ויהי בקר יום אחד

בראשית א:ה

*It is clear that the Torah uses the word 'yom' in different ways. Here (in the same verse) it means both the hours of light and then the full day.*

16. אלה תולדות השמים והארץ בהבראם ביום עשות ה' אלקים ארץ ושמים

בראשית ב:ד

*The Torah refers to the 'yom' on which God created the world. Which day is this? Rashi says it refers to the first day. But Rav Avraham ben HaRambam explains it to mean the period of the six days of creation. He explains that 'day' can mean an extended period of time. He refers to a verse in Devarim.*

17. כל־המצוה אשר אנכי מצוה היום תשמרון לעשות למען תחיו ורבייתם ונבאתם וירשתם את־הארץ אשר־נשבע ה' לאבותיכם

דברים ח:א

*When the Torah refers to mitzvot that God is teaching 'hayom' - today - it means over the whole 40 years in the desert.*

- Rav Eli Munk (Paris mid 20C) writes that, until day 4, there was no sun in the sky and, as such, there can be no meaning to a 24 hour day on days 1, 2 and 3. But were days 4, 5 and 6 then real 24-hour days?

18. להבדיל בין היום ובין הלילה - משנגנז האור הראשון. אבל בשצעת ימי בראשית שמשו האור והחושך הראשונים יחד בין זיוס ובין זלילה.<sup>11</sup>

רש"י בראשית א"ד

Rashi explains that the the light of all 7 days of Creation was NOT the sun and moon but the spiritual light which was later set aside for the tzadikim. Also, during these 7 days the light and dark served together at all times. As such, Rashi understands that all the days of creation worked on an alternative system of time (without the sun and moon). So there may be grounds to say that each of the 6 days (and not just the first three) was not 24 hours.

19. ואמר רב יהודה אמר רב: עשרה דברים נבראו ביום ראשון, ואלו הן: שמים וארץ, תהו ובהו, אור וחשך, רוח ומים, מדת יום ומדת לילה. (רש"י - עשרים וארבע שעות בין שניהם).

חגיגה יב:א

Yet, elsewhere, Rashi explains that the time concept of 'day' and 'night' ie a cycle 24 hours WAS created on the first day.

20. In many places and especially in 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 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

- This approach is support by Prof. Nathan Aviezer in his 2001 book, Fossils and Faith (chapter 2).

#### Questions on this approach

(i) R. Shimon Schwab asks - if the first 6 days were actually aeons, how can it be that the first Shabbat was a real 24 hour day so as to give us our current Shabbat. Some answer that we can never understand precisely how 'God rested on the seventh day', and that we count days differently afterwards (R. Dovid Tzvi Hoffman).

(ii) We do not see any indication in the Rishonim of 6 days being billions of years (although we do see that 'yom' can mean more than 24 hrs).

(iii) The Torah does not say '6 days' but '*and it was evening, and it was morning*'. If a 'yom' is millions of years, what do 'evening' and 'morning' mean?

(iv) Even if the days are billions of years, there are events in the creation narrative which have no clear correlation to the scientific understanding e.g. what is the 'rakia' on day 2? What is the water above and below the rakia?

(v) The order of creation in Bereishit does not correspond to the scientific understanding e.g. the sun and moon were placed in position on day four, after vegetation and trees.<sup>12</sup>

<u>Torah Narrative</u>		<u>Scientific Position</u>
Day 1 - Heavens, Earth, Water, Light	-	14 billion yrs ago: Big Bang
Day 2 - Firmament separating waters	-	4.5 billion yrs ago: Formation of Earth (day 1) and moon and sun (day 4).
Day 3 - Dry land, vegetation, trees	-	500 million years ago ("mya"): Fish (day 5) 438 mya: Land plants (day 3) 434 mya: Land insects (day 6)
Day 4 - Sun, moon, stars	-	400 mya: Flying Insects (day 5) 360 mya: Trees (day 3)
Day 5 - Fish, birds and flying insects	-	300 mya: Land reptiles (day 6) 200 mya: Land mammals (day 6)
Day 6 - Land mammals, insects and reptiles	-	150 mya: Birds (day 5)

Some have tried to make them fit but such interpretations risk becoming speculative or forced.

11. Another girsra of this Rashi reads חזר זיוס חזר זלילה וזו ציוס חזר זלילה, which DOES indicate a 24 hours cycle. See the commentaries on Rashi for further analysis.

12. However, the 'placement' of the sun, moon and stars on day 4 may be a reference to their visibility from earth once the atmosphere had cooled enough for the constant cloud cover to break up and become transparent. Others suggest that it may related to the the fixing of the lengths of the orbits.

**F] APPROACH 7 - THE '6 DAYS' ARE REAL DAYS AND ALSO LONGER/SHORTER PERIODS**

Dr. Gerald Schroeder has an approach, based on the theory of relativity - that the passage of time will differ depending on velocity and gravity. So too each day of creation was a 24 hr day from the perspective of the Creator of the expanding universe at that time. However, from our perspective, in a fully enlarged universe, these 24 hr periods look much longer. This is similar to drawing a 1cm line on a deflated balloon. When the balloon is gradually inflated the same line may become 5, then 10, then 20 cm long. Using the scientific calculations for the expansion of the universe and gravitational forces, Dr Schroeder comes to the following suggestion:

Day 1 = 24 hrs = 7 billion yrs      Day 2 = 24 hrs = 3.5 billion yrs      Day 3 = 24 hrs = 1.8 billion yrs  
Day 4 = 24 hrs = 0.9 billion yrs      Day 5 = 24 hrs = 0.45 billion yrs      Day 6 = 24 hrs = 0.18 billion yrs

**6 days = 6 x 24 hrs = 15.75 billion yrs**

21. ... כי משילאו השמים והארץ מן האפס אל היש הנזכר בפסוק הראשון, נהיה זמן, כי אף על פי שזמנינו זרועים ושעות שכם זאור וזחשך, משיהיה יש יתפש בו זמן.  
רמב"ן בראשית א:ד

22. ויקרא אלהים לאור יום - יאמר כי נצרא הזמן ועשה מדת יום ומדת לילה.

רמב"ן בראשית א:ה

*The Ramban states that the creation of time was linked to the creation of matter.*

23. .... וַיְהִי־עֶרֶב וַיְהִי־בֹקֶר יוֹם אֶחָד. (רמב"ן - ועל דרך הפשט לא יתכן לומר 'יום ראשון', בעבור שעדיין לא נעשה השני. כי הראשון קודם לשני זמנין או זמנעל אצל שניהם נמצאים, 'והאחד' לא יורה על שני).

בראשית א:ה

*The Ramban explains that the Torah says 'one day' not the 'first day' since it is not written retrospectively but from the perspective of the creation on the one and only day, before there was a second day. Thus, we see that the time perspective of the Chumash is the original day of creation.*

24. The first stable matter that formed from the energy of the big bang creation that "ages," that experiences the passage of time, was protons, the subatomic particles that produce much of the mass of an atom and are theorized to be the product of the decay of neutrons into electrons and protons .... The Bible views time looking forward into the expanding space of the universe from the moment of the formation of protons, a moment that was a tiny fraction of a second following the big bang creation of the universe, when the universe was vastly smaller than it is today.  
Our earth-based scientific measure views time looking back in time from the present perspective of our huge universe toward that moment when protons formed, a tiny fraction of a second following the big bang creation of the universe - a time when the universe was vastly smaller than it is today.

Dr. Gerald Schroeder, *The Age of the Universe: One Reality Viewed from Two Different Perspectives*, October 3 2019

25. If we can calculate the magnitude of the expansion of the universe from the start of the biblical calendar's six days to now, we can calculate how the 14 billion years (dinosaurs and all the rest) would appear from the perspective of the Bible. The key word here is perspective. We are calculating the age of the universe from two vastly different perspectives: the Bible's perspective looking forward from the beginning when the universe was vastly smaller than now; our perspective looking back with the universe being vastly larger than in the era near the creation. They are two views of one reality.

ibid

26. Recently, there has been an attempt to reconcile the biblical time scale with modern science by invoking Einstein's theory of relativity. .... This explanation fails because relativistic time dilation is an extremely small effect ..... [which] cannot possibly compress 10 billion years into a mere six days. Indeed this proposal was characterized by Prof. Barry Simon, a distinguished physicist at the California Institute of Technology, as "a fundamental misunderstanding of basic physics ... immediately recognized as fallacious by professional physicists."

Dr Nathan Aviezer, *Fossils and Faith* pp12-13

Questions on this approach

- (i) It is not found in any Torah sources.
- (ii) Other physicists say that the science is simply incorrect.
- (iii) Problems (iii), (iv) and (v) in section E above still need to be addressed and Dr Schroeder discusses these in his presentation.