

The end of the world

In this week's Torah portion, *Vayechi*, the patriarch Jacob is on his deathbed. He calls his sons and tells them:

הָאֶסְפוּ וְאֶגִּידָה לָכֶם אֶת אֲשֶׁר-יִקְרָא אֲתֶכֶם בְּאַחֲרֵית הַיָּמִים

Come together that I may tell you what will happen to you at the end of the days
(*acharit ha-yamim*). [Gen. 49:1]

So we expect to find out what will happen at the end of the days! But instead, Jacob proceeds to bless his children, without failing to criticize some of them, to be sure, and says nothing about the end of the days! Why is that? Why does the Torah announce something, then doesn't deliver? Something must have happened. The Talmud answers:

Jacob wished to reveal to his sons the end of the days, but at that time the Divine Presence -- the *Shechinah* -- departed from him [and he could not prophesy anymore]. He said, "Perhaps, Heaven forbid, one of my children is unfit, like Abraham, from whom there issued Ishmael, or like my father Isaac, from whom there issued Esau.

[But] his sons answered him, "*Shema Yisrael, Hashem Elokenu, Hashem echad*" -- "Hear, O Israel, the Lord our God, the Lord is One" [That is: Hear, O Jacob, who is also called Israel, don't worry, we still believe in only one God!] Just as there is only One in your heart, so there is only One in our heart.

In that moment our father Jacob opened [his mouth] and exclaimed, "*Baruch shem kevod malchuto leolam va-ed* -- 'Blessed be the name of His glorious kingdom forever and ever.'"

The rabbis wondered... Shall we recite [this line also in our prayers]? But our Teacher Moses did not say it. Shall we not recite it? But Jacob said it! [Hence] they decided that it should be recited quietly. [Pesachim 56a]

So this explains why we recite that second line quietly (except on Yom Kippur), but it leaves a host of questions unanswered. Why did God not want Jacob to reveal what will happen when the world ends and *when* it will end? And if God did, why did He tell Jacob the secret the first place, and why did Jacob try to reveal it? And if God did not mind it being revealed, why did he stop Jacob? We can speculate: What would revealing the secret have achieved? If Jacob's sons had known that the Messiah would not come for at least 3,500 years in their future, as we now know, they

might have gotten discouraged and given up. Perhaps that is why God intervened.

Also, we are told that Jacob was afraid that God had abandoned him because one of his sons might be wicked. But God did not abandon the great Abraham or the saintly Isaac because of wicked sons, so why would he abandon Jacob if one of his sons were wicked? Is Jacob less worthy than his father or grandfather? And if Abraham could father a wicked Ishmael and Isaac a wicked Esau, why would Jacob expect that none of his own sons would become wicked? Statistically, since he had twelve sons, it would be even more likely that one of them would become wicked.

Our Sages later told us that by "end of the days" Jacob meant, not the end of life and the universe, but the arrival of the Messiah, who will usher in a time when all will live in peace and recognize God, when all the Jews will move to the Land of Israel and rebuild the Temple. This is called the "final redemption". At that time, according to the prophet Isaiah, all the nations:

"...shall beat their swords into plowshares and their spears into pruning hooks; nation shall not lift sword against nation and they shall not learn war anymore."
[Isaiah 2:4]

But this period shall not last forever. The material world will end. The Talmud says:

The world is [set] to exist for 6,000 years. In the first 2,000 there was desolation [that is, no Torah]; [in the next] 2,000 years the Torah flourished; and the next 2,000 years is the Messianic era, but because of our many sins [the Messiah is delayed and many of] these years have been lost. [Sanh. 97 a-b]

We are in the year 5778. So the Messiah should arrive sometime in the next 222 years, and his era should last until the Jewish year 6000, which is the secular year 2239, when the material world will end. Perhaps that is the time the prophet Isaiah refers to when he quotes God as saying:

For, behold, I create new heavens and a new earth; and the former shall not be remembered, nor come to mind. [Is. 65:17]

So the Messianic period will blend in with the World to Come, *olam haba*, when the dead will come back to life and enjoy a time that is "all Shabbat" - *yom shekulo Shabbat*. To be sure, this period will come after a horrendous world war led by King Gog from the Land of Magog, during which good will obliterate evil. [Ezekiel 38-39; Zechariah 21:2, 14:23; Sukkah 52, Sanhedrin 97, Sotah 49] The only unknown in Jewish tradition at this point is *when* all this will happen.

Now, let me put on my second hat. I am a physicist. So I ask myself: What does science say about the end of days? Well, astronomical observations tell us that our sun is an ordinary star, meaning that it will age and eventually die like all other stars. The earth will have to die with it. So we will have to migrate to other planets to survive. Those planets will also eventually die. Physics tells us that the end of the world is expected to come from the second law of thermodynamics. This law states that entropy always increases, which means that things go inexorably from order to disorder. If you create some order over here, it is compensated by even more disorder over there. (I am sure you have all experienced that!) So there will come a point when, inevitably, all the atoms in creation will be milling about aimlessly, all carrying the same amount of energy. This means that there will be no concentrations of mass and energy that might bring order. It is called the "heat death of the universe". It is called that because everything will be at the same temperature. It will not happen for a very long time -- at least 100 billion years. It will be a very gentle end, not a cataclysmic one. Unless we learn how to reverse entropy, which does not appear feasible, we cannot avoid it.

Let me interject an intriguing observation of mine. Entropy is a measure of how much freedom of movement there is. The law tells us that there is a basic impulse in the universe to maximize freedom of action. And how much more freedom can there be when individual atoms are totally free to move around, when they are not constrained by any ties to other atoms, when they are not forced to be part of a larger structure? So we see that "freedom" is a very fundamental yearning in nature, and not just for human beings! Inanimate objects also want freedom.

The following is worth noting. Before the 1960s, the preferred theory among scientists was that the universe has always existed and always will. This was called the "steady-state" theory. Then came observations, in the 1960s, which confirmed that the universe started with a Big Bang 13.7 billion years ago. But way back in 1862, a century earlier, some physicists wondered: If the universe has always existed, as we believe, why isn't it in heat death *now*? The fact that it isn't implies that the universe must have had a beginning. This thought could have led them to deduce the Big Bang, thereby validating the account of creation in the Torah. But it didn't. What a missed opportunity! Could there be an anti-religion component in this missed opportunity?

Scientists have thought of other scenarios, which all end up with the demise of the material world. When observations showed that the universe is expanding, it was thought that the expansion would slow down at some point and eventually stop, and gravity would make everything implode back into a single point. It would be a reverse Big Bang, with no possibility even to leave a note behind. They called it the “Big Crunch”. Now, observations show that the expansion of the universe, far from slowing down, is accelerating at a speed faster than light. This means that the galaxies are moving faster and faster away from one another, to the point where one day the density of matter will be so low as to not allow any life to continue. They call it the “Big Freeze”, and it will accelerate the “Heat Death” mentioned earlier.

Now, how do we reconcile the Jewish account with the many scientific accounts? Simple: They all agree that the material world is not forever. It is going to end. As for what will happen after it, science is silent, but the Talmud [Berakhot 17a] tells us that after the material world, we will enjoy a spiritual world, where our needs and yearnings will be totally different, in a way that we cannot comprehend today. Maimonides summarizes it as follows:

There are no bodies and no bodily forms in the World to Come... Nor does there occur there any of the events which occur to the human body in this world, such as sitting, standing, sleeping, death, distress, laughter, and so forth, ... no eating or drinking or procreation. The righteous will sit with their crowns on their heads and bask in the radiance of the Divine Presence... There is no way for us in this world to know or comprehend the great goodness which the soul experiences in the World to Come, for in this world we know only of material pleasures, and it is these that we desire. [Rambam, Yad, Teshuvah 8]

Isaac Asimov, the science-fiction writer, wrote a short story called "The Last Question". That question was: How can we reverse entropy? In the story, successive generations face more and more entropy, more and more disorder around them, until the universe dies a heat death. At that point, a voice says: “*Yehi or* -- Let there be light!”

The poem *Adon Olam*, which we sing at end of services, echoed that same sentiment when it was written in the 11th-century. It says:

Ve-acharei kichlot hakol levado yimloch nora.

And when everything shall cease, God will still reign in majesty.

Shabbat shalom.