

The first *pasuk* in the *Torah*, as well as all the *pesukim* that follow, have much to teach beyond their plain words. In fact, there are at least three examples of considerably "scientific" *divrei Torah* just from the first couple of words. The three explanations that this article will address are related to mathematics, invention, and the laws of nature.

King Ptolemy II (283-246 BCE) wanted a Greek translation of the *Torah* (the Septuagint). He gathered 72 elders of Israel and sequestered them in 72 different houses (*Megillah* 9a). He visited each of them and said, "Translate for me the book of Moses your teacher." The Jewish elders felt that if they gave Ptolemy Gd's literal words to Moses - Ptolemy might be misled or use it against the Jewish people. So, the Sages each miraculously altered the first verse of the *Torah*. Instead of writing " - - בראשית *Bereshit*, (In) the beginning, created Gd..." they wrote "—אלקים *Elokim* (Gd) created, (in) the beginning," thus beginning the *Torah* with the letter - א *aleph* instead of the letter - ב *bet*. But, why is it that *Torah* begins with a *'bet*? Would not the first letter of the *aleph bet*, the *aleph*, be more appropriate for a beginning?

There is a mathematical phenomenon that can be demonstrated based on the first letter of the *Torah*. As when constructing a protein sequence from the genetic code, ribosomes translate every three nucleotides found in DNA into an amino acid. Each set of three nucleotides is known as a codon. Applying this technique to the *Torah*, one could count the subsequent 3 numerical sequences (codons). When starting with the number 1 and adding every 3 consecutive numbers, the sum will always add up to 6.

For example:

$$1 + 2 + 3 = 6$$

$$4 + 5 + 6 = 15; 1 + 5 = 6$$

$$7 + 8 + 9 = 24; 2 + 4 = 6$$

And so on. However, when starting with the number 2, what is known in protein translation as "frameshift mutation" occurs, and the sum of every three consecutive numbers will always add to 9.

$$2 + 3 + 4 = 9$$

$$5 + 6 + 7 = 18; 1 + 8 = 9$$

$$8 + 9 + 10 = 27; 2 + 7 = 9$$

The mathematical reason for this is that adding three consecutive numbers could be represented by the following form: $n + (n+1) + (n+2) = 3n + 3$. When we start counting from 1, $n = 1 + 3x$. When the counting starts from 2, $n = 2 + 3x$. Therefore, when beginning the consecutive count from the number 1, all possible combinations are represented by the following equation: $3(1+3x) + 3 = 6 + 9x$; and when beginning the consecutive count from the number 2, all possible combinations are represented by 3

$(2+3x) + 3 = 9 + 9x$, where x is an integer that represents how many "codons" away from 1 you currently are.

When starting with 2, the consecutive numbers add up to a multiple of 9, which, as a rule, when added together always add up to 9. When starting with 1, we do not end up with a multiple of 9, instead, the number 6 is involved.

The significance of this phenomenon is understood after taking the numerical values for the Hebrew words *sheker*, falsehood, and *emet*, truth. The *gematria* of these values is found by adding the numerical worth of each letter in each word:

$$1 = א$$

$$40 = ט$$

$$400 = ת$$

Adding to a total of 441.

$$300 = ש$$

$$100 = ק$$

$$200 = ר$$

Adding to a total of 600.

It is then observed that $4 + 4 + 1 = 9$ (representing *emet*), $6 + 0 + 0 = 6$ (representing *sheker*). Thus, one of the lessons derived from the fact that the *Torah* starts with a *bet* and not an *aleph* is that the *Torah* is always based on truth, and not on falsehoods. In this example, mathematics can be used to demonstrate an answer to why the *Torah* starts with a *bet* and not an *aleph* [1].

Another answer to this question is given by Rabbi Lord Jonathan Sacks, former Chief Rabbi of the United Hebrew Congregations of the Commonwealth. He notes that while the *Torah* begins with a *bet*, the Ten Commandments, which begin with "*Anochi Hashem*," start with the letter *aleph*. This teaches that first, with an *aleph*, we must establish that *Hashem* makes the rules of the world. Only then, with the *bet*, we are able to begin creating and building the world. *Chochmah* is defined as acquired knowledge, and the *Torah* is revealed knowledge. *Anochi Hashem*, the revelation of *Torah*'s true knowledge, must always come before creation and the acquiring of knowledge. We must know our limits within our own creations. The *bet* of creation is secondary and must always be regulated by the *aleph* in *Hashem*'s "*Anochi*." When it comes to invention, our power does not lay in what we can do, but rather what we may do.

Rabbi Sacks related this to assisted reproductive technologies. Our power comes not from how much technology we can invent, but rather from our knowledge of when to stop. For example, technology in this field can possibly allow us to clone human beings, have a child with three

parents, or even produce human chimeras. It is up to humankind to decide, from the given Torah knowledge, what type of knowledge should be desirable to acquire, and which knowledge we may not acquire [2].

A similar message is found from the fact that the Torah discusses the building of the *Mishkan*, the Tabernacle, in a consecutive five *parshiot*, in great detail of its dimensions. This question is more perplexing due to the fact that the *Mishkan* was not a permanent structure, but simply a temporary, portable place of worship for *Bnei Yisrael* while they were in the desert. Rabbi Sacks explained, "G-d creates order in the natural universe. We are charged with creating order in the human universe. That means painstaking care in what we say, what we do, and what we must restrain ourselves from doing. There is a precise choreography to the moral and spiritual life as there is a precise architecture to the tabernacle. Being good, specifically being holy, is not a matter of acting as the spirit moves us. It is a matter of aligning ourselves to the Will that made the world."

This leads to a third idea that comes from the first *pasuk* of Torah, which relates to nature. "*Elokim*" is the Divine name used in the first *pasuk*. The *gematria* value of this name is 86. The Hebrew word *HaTeva* (the nature) also has a value of 86. Baal Haturim, Rabbi Jacob ben Asher, the 13th century Biblical commentator and author of the *Tur*, connected these two values and noted that the connection teaches us the lesson that nature exhibits the Divine will. No aspects of nature would occur if *Hashem* was not making it happen. This emphasizes that **this** name of G-d is bound up with the laws of nature. "*Elokim*" is that aspect which is active in the world, that aspect which directs the world through the laws of nature and that aspect which gives everything in the world its life and powers. One can also simply look at the vastness of nature to come to this realization. The occurrences of nature are, otherwise, impossible to be random [4, 5].

A wonderful example of this is the golden ratio, a ratio found in many "random" places in nature. The golden

ratio is a number, approximately equal to 1.618033 (an irrational number which continues forever), which repeatedly shows up in nature and natural occurrences. The Fibonacci sequence, discovered by Italian mathematician Leonardo of Pisa, was first written about in 1202. It is a sequence in which each next number is the sum of the two preceding ones: 1, 1, 2, 3, 5, 8, 13, 21...

This sequence is just one example where the golden ratio shows up in nature. The golden ratio, where $\phi=1.61803\dots$, is calculated by dividing each number in the Fibonacci sequence by its preceding number, each division yields a number close to phi. As the sequence continues, phi becomes more accurate. Today, its emergent patterns and ratios can be seen from the microscale to the macroscale, and right through to biological systems and inanimate objects. While the Golden Ratio does not account for *every* structure or pattern in the universe, it is certainly a major player. "The basic idea is that there is a connection between everything, and through these connections, one becomes especially conscious of the deliberate order with which nature is created" [6]. An example is the tightly packed seeds of a sunflower. The seeds rotate based on the phi ratio and they can therefore be as tightly packed as possible. Even the ratio of our DNA's double helix turn is close to phi [7].

As demonstrated in the above examples, the first *pasuk* of the Torah has much to teach us. The Torah is based on truth, we are not free to manipulate the world as we wish, and Hashem controls nature and is behind the miracles that occur each day.

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