

Rabbi Edward Reichman, MD is a Professor of Emergency Medicine at Einstein College of Medicine and received his semikhah from RIETS. He writes and lectures widely in the field of Jewish medical ethics. Shmuel Reichman is a semikhah candidate at RIETS and is pursuing an interdisciplinary master's degree in Jewish Philosophy and Jewish Education at Revel and Azrieli.



THE DEFINITION OF MATERNITY REVISITED AND THE DOUBLE HELIX (SPIRAL) OF TORAH AND MADDA

We all experience life, and all the chagim, through the medium of time. Events that happened yesterday, are currently happening today, and will most probably continue happening tomorrow. Every holiday we experience represents a unique point in time. But to truly tap into the holiday experience, and to appreciate the nature of innovation, we must

first understand the nature of time itself.

The most widely accepted understanding of time is that it moves in a straight line. Hashem created our world of space and time, and since its inception, time has been moving inexorably forward. The line of time creates the past, present and future. We all experience

our lives in the present. If we move backward on the line of time, and peer into our history, we can find Avraham Avinu at the Akeida, Moshe Rabbeinu accepting the Torah, and the Rambam writing the *Mishneh Torah*. However, there is a major problem with this theory. There is a *piyut* in the Haggadah (*UV'chen Va'amartem*) that says that Avraham Avinu served matzah to the three

We would like to dedicate this article *l'zecher nishmas* our dear respective parents and grandparents, Rav Baruch ben Yitzchak Isaac and Rebbetzin Raizal Shoshana bas Aharon Yosef, *zichronam livrachah*. We hope that these divrei Torah will be an *aliyas neshamah* for them.

malachim because it was Pesach. Rashi agreed, and writes that Lot did the same for the *malachim* who visited Sodom (Bereishis 19:3). How can this be? The mitzvah of matzah originates from *yetzias Mitzrayim*, and this would not occur for another few centuries.

The answer requires us to develop an even deeper understanding of time. Time doesn't move in a straight line, but rather, in circles. As the Ramchal explains, Hashem created time to move in thematic circles, where each point in the year represents certain unique spiritual energies. Rosh Hashanah, Yom Kippur, Succos, and all the *chagim* are associated with unique spiritual themes and energies.

This understanding completely transforms our perspective of time. We don't celebrate *zman cheiruseinu*, the time of our freedom, because the Jews were redeemed on the 15th of Nisan. Rather, the Jews were redeemed on the 15th of Nisan *because* it was *zman cheiruseinu*. The time of freedom is what allowed them to escape the slavery of Mitzrayim. This is why Avraham and Lot were eating matzah long before the actual *ge'ulah*. They were tapping into the spiritual waves of time, not commemorating a historical event. Time is thus a circle, not a straight line.

Each Shavuot, we reaccept the Torah and recreate the experience of *Matan Torah*. We are not simply trying to experience what already occurred, however; we are trying to take it one step further, ascending the spiral, reliving the experience anew, on a different spiritual plane. *Kabalat ha-Torah* this year is on a higher level of the spiral than last year. So in a real sense, we are receiving the Torah anew, in a new dimension of time and spiritual energy.

However, even the circle analogy is limiting. Time is not a recreation and repetition of the past. We don't want to re-experience the past every year. Returning to the same point on the circle would be pointless. Instead, every single year, when we return to a point on the circle, our goal is to expand upon what we created last year. Each Rosh Hashana should be a new Rosh Hashana; each Pesach, a new Pesach; each Shavuot, a new Shavuot. We must convert the two-dimensional circle into a three-dimensional *spiral*. We maintain the circularity while allowing for ascension.

This theme expresses itself in many different areas of our lives. For example, each Shavuot, we reaccept the Torah. This is why, as the Rav famously explained, there is a *minhag* to stand during the Torah reading — because we are trying to recreate the experience of *Matan Torah*. We are not simply trying to experience what already occurred, however; we are trying to take it one step further, ascending the spiral, reliving the experience anew, on a different spiritual plane. *Kabalat ha-Torah* this year is on a higher level of the spiral than last year. So in a real sense, we are receiving the Torah anew, in a new dimension of time and spiritual energy.

As we continually rise in our spiritual world, so too do we rise in the material world. Each year as we read the phrase, “*U-milu ha'aretz vi-chivshuhah*” (Bereishis 1:28), we rededicate ourselves to conquering and harnessing the powers of the natural world for the good of man. Each year's “*vi-chivshuhah*” surpasses that of the previous year. In the same way, fields of science, medicine and technology evolve with the passage of time, building on previous discoveries.

It is perhaps no coincidence that the very building blocks of the human being, the DNA, are helical or spiral in structure. Our double helix, if you will, is the parallel ascension of Torah and *madda* in tandem. Indeed, Chazal (*Zohar*, Parashas Terumah) teach us that “*Kudsha Berich Hu istakel b'oraissa u-bara alma*,” Hashem used the Torah as a blueprint for the creation of the world, and DNA is the blueprint for the creation of the human being. This notion that Hashem used the Torah to create the physical world may hold the key to our ability to address innovations in medicine from a halakhic perspective.

In connection with the *chag* of Shavuot, we will briefly discuss some innovations relating to one specific area of medical halakhah. Chazal explain that on Shavuot, Bnei Yisrael married Hashem; *yetzias Mitzrayim* was the *eirusin*, and *Matan Torah* was the *nesuin* (see the introduction to *Sefer HaMakneh*). Shir Ha'Shirim reflects this love story between Klal Yisrael and Hashem. *Pru urvu*, the mitzvah to procreate, is an essential component of marriage. As we metaphorically marry Hashem on Shavuot, let us briefly explore new challenges to the definition of maternity in halakhah. Our objective

is not to provide a comprehensive halakhic analysis, but rather to raise the issues that will require and enable us to reapply the Torah anew.

With modern reproductive technology it is now possible for one woman to provide the genetic contribution, the seed/DNA, and another to provide the nurturing environment required for the growth or expression of the seed (i.e., gestation). Which one of these women, if either, is considered the halakhic mother?

Moshe Rabbeinu foreshadowed this debate in his cry to Hashem, alluding to both conception and gestation as being identified with maternity:

הָאֲנָכִי הָרִיתִי אֶת כָּל הָעַם הַזֶּה אִם אֲנָכִי
יִלְדֶתֶיהוּ כִּי תֹאמַר אֵלַי שְׂאֵהוּ בְּחִיקָךְ כְּאִשָּׁר
יִשָּׂא הָאִמּוֹן אֶת הַיֶּלֶד עַל הָאֲדָמָה אֲשֶׁר נִשְׁבַּעְתָּ
לְאֲבוֹתָיו.

Did I conceive all this people, did I bear them, that You should say to me, "Carry them in your bosom as a nurse carries an infant," to the land that You have promised on oath to their fathers?

Bamidbar 11:12

To be sure, this debate is not new, and surrogate motherhood has become commonplace in the Jewish community. However, new innovations force us to revisit the issue, requiring the advocates of the two major halakhic positions to reapply the age-old principles of the Torah to even newer circumstances.

According to the *poskim* who consider genetics to be the determinant of halakhic maternity, behold the following two innovations:

Mitochondrial Transfer

While most of our DNA resides in the nucleus of the cell, a small

percentage is found in a small structure in the fluid of the cell called the mitochondria. The mitochondrial DNA is transmitted exclusively through the mother. Mutations in this gene can cause severe and sometimes fatal disease. It is now possible for a woman possessing defective DNA in her mitochondria to produce a healthy child through the process of mitochondrial transfer. Through this process an egg is created with the woman's nuclear DNA and the healthy mitochondrial DNA of a donor. The composite egg is then fertilized with the seed of the woman's husband to produce the child, who has three genetic parents.

For those authorities who consider genetics the determinant, who would be the halakhic mother in such a case? Is it possible to have two genetic mothers? Would we invoke the principle of *rov* (majority)? Or is the mitochondrial DNA a *davar hama'amid*, a substance of too great significance to be nullified. Perhaps the paradigm of *bitul*, or nullification, simply has no role in the determination of maternal status.

What if the mitochondrial donor is not Jewish — does the child need a conversion? Is the conversion primary, such that if it were a female child she would be precluded from subsequently marrying a kohen? If the nuclear donor is a Yisrael, but the mitochondrial donor is a daughter of a Kohen, would the child require a *pidyon haben*?

Artificial Reproductive Seed

Another development that will require a reevaluation of the position that considers genetics paramount is the creation of so-called artificial

reproductive seed. While no child has yet been born through this process, scientists have demonstrated proof of concept to be able to cultivate a gamete (reproductive cell) from a bone marrow stem cell. It would be possible for both men and women to each produce either eggs or sperm. A man could therefore produce an egg cell, which could then be fertilized with natural male reproductive seed. Who would be the halakhic mother in this case? Neither Chazal, nor any scientist, has ever conceived of anyone other than a woman contributing the egg to reproduction. Would a man fulfill the mitzvah of *pru urvu* by creating an artificial egg? If a man were a mamzer and contributed artificial male (or female) seed to the production of a child, would the child be considered a mamzer?

Neither of the two aforementioned advances would present an issue for the authorities who consider the gestational carrier to be the halakhic mother. There is, however, another innovation that challenges this position.

The Artificial Womb

Scientists recently successfully gestated a goat removed from its mother's womb in an artificially created womb for eight weeks. The ultimate conceptual objective of this research is to facilitate ectogenesis — the gestation of a fetus completely outside the womb from conception to complete development. Ectogenesis raises a plethora of halakhic issues, including even whether the product enjoys human status.

Assuming the humanity of the progeny, who would be its halakhic mother? For those who consider

genetics the determinant of maternity, the artificial womb bears no impact. Those who consider the gestational or birth mother to be the halakhic mother, however, may need to rethink their position. In the absence of a woman gestating the fetus, would maternity default to the genetic donor, or would the fetus simply have no halakhic mother? Inanimate objects, such as test tubes, petri dishes and ziplock bags (artificial wombs), are presumably disqualified from maternal consideration.

The approach to the artificial womb by authorities who consider the birth or gestational mother to be the halakhic mother may depend on their particular analysis.

- For those who are in doubt and out of *safek* (doubt) consider both mothers to have claim on maternity, here there is only one candidate. Perhaps the genetic mother should be the sole halakhic mother.
- For those who maintain that the sources specifically reflect gestation as the determinant (e.g., agricultural sources, *Yevamot*, Midrash of Rachel and Leah), absent a gestational (or birth) mother, there would perhaps be no halakhic mother.

As an additional thought experiment, if we combine the technologies and use artificial male and female reproductive seed to produce a fertilized egg, which is then placed in an artificial womb, all positions would be challenged! All would be forced to apply the Torah anew.

Since these innovations could not possibly have been anticipated by our predecessors, it is precisely in the fields of medicine and technology

True, the Torah may not specifically mention artificial wombs, mitochondrial DNA, or artificial seed, yet, all the key principles are found within it. By delving into the Torah, and deeply understanding Hashem's wisdom, we can apply it to every situation that arises in the modern world. *Hafoch ba vi-hafoch ba d'chola ba* — search in it and search in it because all is in it (*Avos 5:22*).



that many wonder how legal halakhic precedent can be found.

The solution lies in the notion of principle-based learning. As the Ramchal maintains, true wisdom requires us to always seek the key underlying and fundamental principles and concepts. All the details and applications stem from these key principles. True, the Torah may not specifically mention artificial wombs, mitochondrial DNA, or artificial seed, yet, all the key principles are found within it. By delving into the Torah, and deeply understanding Hashem's wisdom, we can apply it to every situation that arises in the modern world. *Hafoch ba vi-hafoch ba d'chola ba* — search in it and search in it because all is in it (*Avos 5:22*).

The question remains, however, why is this true? Perhaps Torah principles themselves are not sufficient to address these new advances? The answer lies in the ultimate source of all wisdom. All the wisdom of science,

medicine, and technology stems from the Torah, as the physical world itself is an expression and emanation of the Torah and the spiritual world. As we mentioned above: "*Kudsha Berich Hu istakel b'oraisa u-bara alma*," Hashem looked into the Torah, and used it to create and form the world. When we understand the deep principles of Torah, we can see them expressed within science, medicine, psychology, mathematics, and all other forms of *madda*. Since all sciences are derivatives of the Torah, we can surely find sources from within this very Torah to address any attendant halakhic issues. Therefore, the innovation of the Torah is inextricably linked to the innovation of science; they are parallel spirals or helices.

We have the minhag of placing trees and other plants in our shuls on Shavuot. Perhaps it would be more appropriate to place seeds. Man is compared to the tree (*ki ha'adam etz ha-sadeh*). When we view the grown tree, we must remind ourselves of its

ultimate origins. We must source all expression back to its root, back to its seed, back to the DNA. Just like we are trained to source ourselves back to Hashem, we must also train ourselves to source *madda* back to its roots in Torah.

This requirement to source back to the root may be reflected in an enigmatic Mishnah in *Avos* 3:7. The Mishnah says that if a person is learning Torah, stops upon encountering a tree, and comments “*Ma na’eh ilan zeh* — How beautiful is this tree!” he is *mischayiv bi’nafsho* — liable for his life. The commentaries struggle to explain the egregious nature of this seemingly innocuous act. The simple understanding is that he wasted time from his Torah study. But according to R’ Shimshon Raphael Hirsch, the deeper understanding is that he failed to see the beauty of the physical world as an integral expression of the Torah and spiritual world. *He stopped* his learning, and then admired nature. The ideal is to see the beauty of the physical as the manifestation and emanation of the *spiritual beauty*, and not as a separate and distinct idea that requires discontinuing one’s learning.

We might suggest an alternate interpretation. Perhaps his sin was admiring the finished product, the “*ilan*,” without acknowledging the seed/DNA from which it came. Failing to appreciate, acknowledge, and source it back to its original seed is indeed a crime for which one is *mischayev bi’nafsho*.

Shavuot is also known for its agricultural name, *Chag Hakatzir*. As we harvest the fully ripened produce, we must likewise remember that it is ultimately sourced back to its DNA, as we source ourselves back ultimately to our source, Hashem and His Torah.

This is also integrally related to the process of learning Torah. Whenever we learn any *sugya* of Gemara, we invariably begin by looking for a Torah source. This is not just an intellectual exercise. It is because everything and anything we are learning or thinking about must find its roots in the Torah, for everything in the world stems from that blueprint and foundation.

This could likewise be the philosophical underpinning of the maternity debate. Whom do we value more? The one who provides the seed/DNA, or the one who produces the expression of the seed, the finished product? If we view the completed child without appreciating its origin from DNA, perhaps we would be *mischayev bi’nafsho*.

From one perspective, new medical innovations simply create more work, questions, and doubts among halakhic Jews and rabbinic authorities. This may be misguided. Perhaps we can suggest a different perspective. Instead of being a problem, every new innovation in the modern world gives us the *opportunity* for constant innovation in Torah. It forces us to think in new ways, so that we can truly master the principles of Torah in order to apply them to these new circumstances. This is the very essence

of *kabbalat ha-Torah*. Not to reaccept what we’ve already accepted, but to take it to the next level in the spiral, the next rung of the double helix. As the helix of *madda* continues to ascend, its complementary helix of Torah ascends in consonance, bound together as one. Whatever innovations are developed in the future, we will continually reaccept the Torah by applying its principles to every new circumstance.

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