

HALACHIC AND HASHKAFIC ISSUES IN CONTEMPORARY SOCIETY

SERIES 2: 25 - JUDAISM AND THE UNBORN CHILD GENETIC MODIFICATION AND SELECTION OF EMBRYOS OU ISRAEL CENTER - SPRING 2022

As creator of 'CRISPR babies' nears release from prison, where does embryo editing stand? - Science, March 21 2022

Biophysicist He Jiankui, having served a 3-year sentence for creating the world's first genetically engineered babies, may be released from a Chinese prison this week *[AM - he was released in early April]* His largely secret use of the genome editor CRISPR to alter the DNA of human embryos and implant them into two women led to three births, sparking ethical outrage and fears for the babies' health (about which little is known). It did not, however, bring an end to basic research on human embryo editing.

The response to He's November 2018 announcement was "severe and vibrant," says Fyodor Urnov, who studies CRISPR-based genome editing at the University of California, Berkeley. For now, Urnov sees no circumstance that would justify efforts to genetically modify babies. But he strongly supports using CRISPR to fix disease-causing mutations after birth, without causing heritable changes to a human genome, and regrets that "we have poured a jar of tar on gene editing." And Urnov and others believe that, used responsibly and safely, embryo editing could eventually prove a powerful tool against disease in rare circumstances. In laboratory studies, they continue to explore possible avenues—and the many hurdles.

.... a study reported last week in which a research team working with surplus human embryos from in vitro fertilization (IVF) clinics showed how CRISPR could rid a newly fertilized egg of an extra copy of a chromosome—a problem that can lead to Down syndrome and other medical conditions. Other groups are exploring how to introduce heritable genetic changes via human sperm or eggs. There are "quite a lot of people pushing boundaries" in that regard, says Robin Lovell-Badge, a developmental geneticist at the Francis Crick Institute—although few if any think the work is ready for the clinic.

The original concerns about designer babies centered on CRISPR's sloppiness. The DNA-cutting enzyme that is one of its two components occasionally slices unintended spots, and even if the cut is on target, the cell's gene repair equipment may scramble adjacent DNA by inserting or deleting bases, potentially creating new harm. Indeed, a study of CRISPR-altered human embryos found 16% had these "unintended editing outcomes" at the targeted DNA ...

Genetic screening of edited IVF embryos might not catch these errors. Although CRISPR is introduced right after fertilization, at the single-cell stage, its action is not necessarily immediate. "The edit may occur at the two-cell or four-cell stage, so not all the cells are identical," Lovell-Badge says—a phenomenon called mosaicism. Both incorrectly altered and unaltered cells can easily go undetected because an embryo is screened by taking a sample of its cells at the 5-day stage, when it contains about 100 cells.



One of the human embryos on which the genome editor CRISPR was used to destroy an extra chromosome

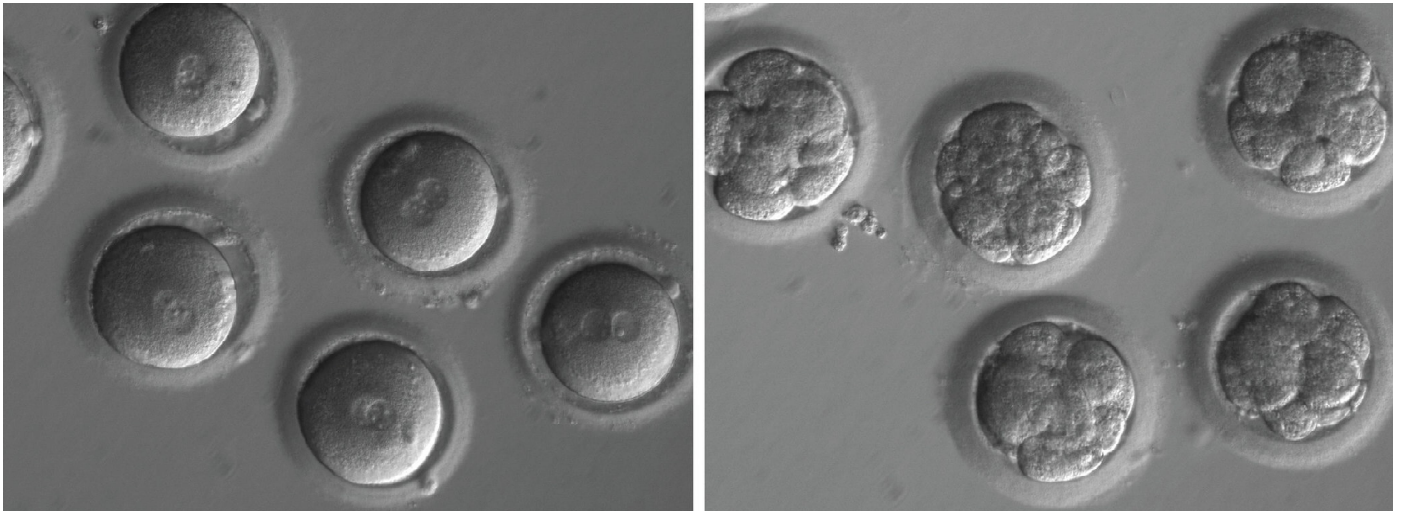
Stem cell researcher Dietrich Egli at Columbia University hopes to find a way to start and stop CRISPR at the embryo's single-cell stage, preventing mosaicism. In the meantime, his group has found a specific kind of CRISPR edit for an embryo that vastly reduces the risk of unintended DNA changes.

Researchers studying CRISPR in human embryos face obstacles beyond the science. In the United States, Congress forbids government funding of research with human embryos, forcing Egli, Mitalipov, and others to rely on foundations, academic institutions, or companies. Legislation also prevents the U.S. Food and Drug Administration from even evaluating therapies that edit human embryos.

The 3 years since He went to prison have seen glimmers of progress in heritable human genome editing, but many scientists say the increased awareness of CRISPR's shortcomings has underscored the recklessness of transplanting edited embryos with the technology available today. An exception is Russian geneticist Denis Rebrikov, one of the few scientists after the He scandal to openly advocate implanting edited embryos into people. "We've done a lot of validation experiments, and now we're confident that we can move on to real clinical use," Rebrikov says.

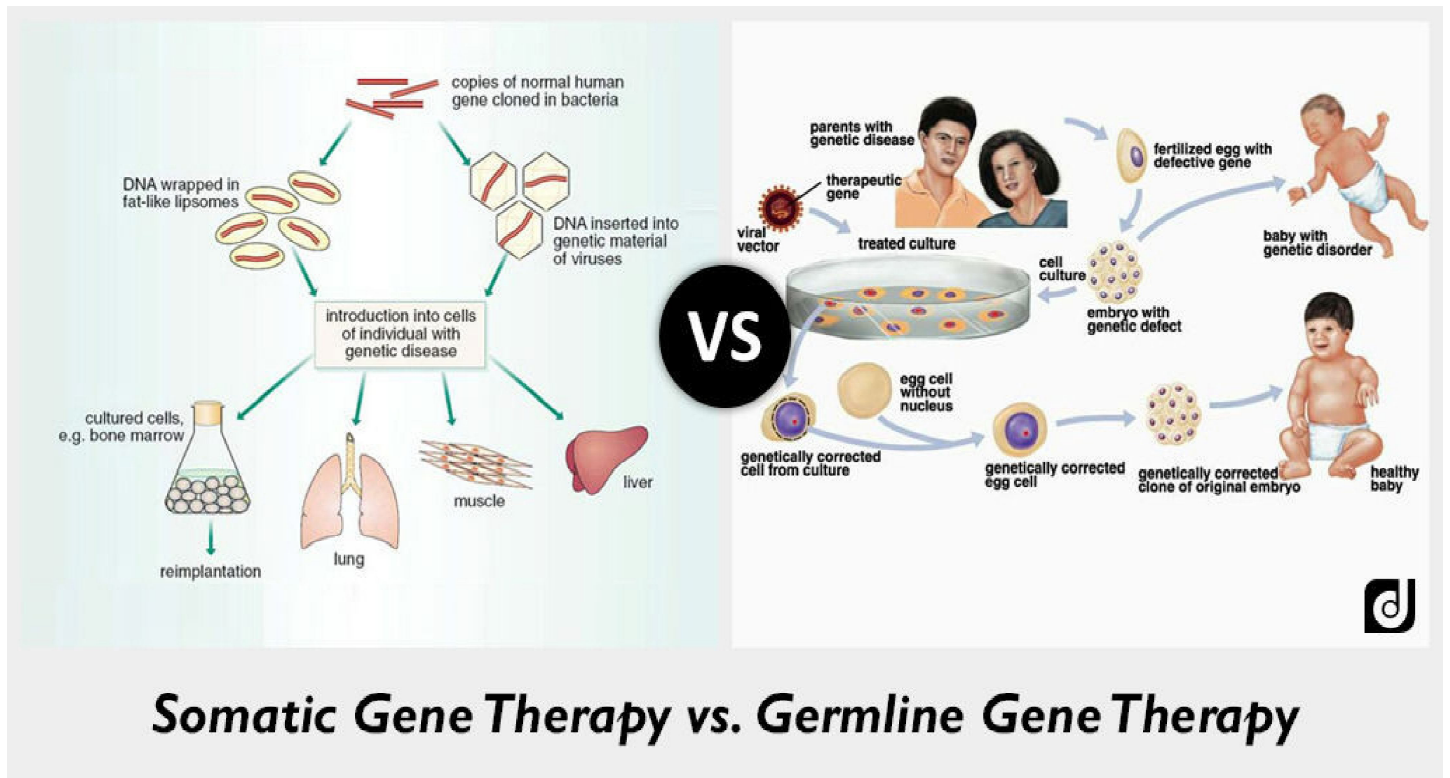
Lovell-Badge speaks for most researchers when he says such confidence is unwarranted. Stick to lab work on embryo editing for now, he advises. "People should do as much preclinical research as they can, and let's find out whether it's feasible."

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Left: Newly fertilized eggs before gene editing. Right: Embryos after gene editing and a few rounds of cell division²

A] WHAT IS GERMLINE GENE THERAPY?



Somatic Gene Therapy vs. Germline Gene Therapy

1. <https://www.science.org/content/article/creator-crispr-babies-nears-release-prison-where-does-embryo-editing-stand>
 2. Credit Shoukhrat Mitalpov

Gene therapy is technique in which nucleic acid polymers are delivered into a patient's cell. This technique is used to treat diseases just like drugs, which is why genes used in gene therapy are called 'drug genes'. Gene therapy can be either *somatic* gene therapy or *germline* gene therapy. In somatic gene therapy, the drug genes are introduced in the somatic cells of the body. When drug genes are introduced in the germ cell or zygotes it is called *germline gene therapy*. Changes in somatic gene therapy are not heritable while in germline gene therapy changes are heritable.³

B] ETHICAL AND RELIGIOUS ISSUES

Ethical Issues are often raised, including the following:

- How can 'good' and 'bad' uses of gene therapy be distinguished?
- Who decides which traits are 'normal' and which constitute a 'disability' or 'disorder'?
- Will the high costs of gene therapy make it available only to the wealthy?
- Could the widespread use of gene therapy make society less accepting of people who are different?
- Should people be allowed to use gene therapy to enhance basic human traits such as height, intelligence, or athletic ability?
- Should people be allowed to select male or female embryos on the basis of sex?
- Is this a next step to human cloning?

In wider society, religious Issues are often raised, including the following:

- Are human beings 'Playing God'? Is there a limit to how much humans can interfere with nature?
- How do hubris and humility play out in radical technological developments?
- What is the status of fertilized eggs? Are they human in any way? Are there limits to what we can do with them?
- What is the role of religious leaders in this area?

C] META-HALACHIC PERSPECTIVES

1. א"ר ישמעאל אלעזר בן עזריה עליך ראייה ללמוד שאתה מחמיר - שכל המחמיר עליו ראייה ללמוד (תפארת ישראל - שכל דבר שלא נדע טעם לאסרו מותר הוא בלי טעם. דלא הזכירה התורה דברים המותרים כולן, רק דברים האסורים) משנה ידים פרק ז משנה ג ותפארת ישראל שם ס' כז

The Torah specifies what is NOT permitted. In the absence of such a prohibition, the assumption is that the act in question is permitted!

D] HASHKAFIC PERSPECTIVES

D1] GENERAL PERSPECTIVES ON INNOVATION

2. וכך יפה לנו שלא להבעית את ישראל בחדשות שלא שערו אבותינו. ומלתי כבר אמורה - החדש אסור מן התורה בכל מקום

שו"ת חתם סופר חלק א (אורח חיים) סימן קפא

The Chatam Sofer was famous for a more conservative position on many issues - trying to avoid new innovations in Jewish practice. However, that does NOT mean that the Chatam Sofer was opposed to addressing the impact of new technology on halacha.⁴ His concerns were more with the gradual encroachment on Minhag Yisrael.

3. הישן יתחדש והחדש יתקדש! ויחדו יהיו לאבוקות אורים על ציון

אגרות ראייה א' קסד (עמ' ריד)

Rav Kook famously saw innovation as an opportunity for increasing kedusha in the world⁵.

3. See <http://www.differencebtw.com/difference-between-somatic-gene-therapy-and-germline-gene-therapy/>

4. In fact, he was famously in favor of using the innovation of the long slow-burning fuse on Shabbat, so that a fuse could be lit before Shabbat, burn slowly and then kindle wood which would heat up food on Shabbat morning.

5. This statement was made about cultural innovation. It does not of course mean that Rav Kook was necessarily in favour of halachic leniency in areas of technological innovation. For more on Rav Kook's approach see below and also Orot Hakodesh 2, Hamegama Haelyona 33, page 563 and Orot Hatechiya sections 16 and 30.

D2] THE ROLE OF MANKIND IN TECHNOLOGICAL INNOVATION

4. וזו שאלה שאל טורנוסרופוס הרשע את ר"ע: אם אלקיכם אוהב עניים הוא, מפני מה אינו מפרנסם? א"ל: כדי שניצול אנו בהן מדינה של גיהנם. א"ל: אדרבה, זו שמחיבתן לגיהנם! אמשול לך משל, למה הדבר דומה? למלך בשר ודם שכעס על עבדו וחבשו בבית האסורין, וצוה עליו שלא להאכילו ושלא להשקותו, והלך אדם אחד והאכילו והשקהו. כששמע המלך לא כועס עליו!! ואתם קרוין עבדים, שנאמר: (ויקרא כה) כי לי בני ישראל עבדים! אמר לו ר"ע: אמשול לך משל. למה הדבר דומה? למלך בשר ודם שכעס על בני וחבשו בבית האסורין, וצוה עליו שלא להאכילו ושלא להשקותו, והלך אדם אחד והאכילו והשקהו. כששמע המלך לא דורון משגר לו? ואנן קרוין בני, דכתיב: (דברים יד) בנים אתם לה' אלהיכם.

בבא בתרא י.

R. Akiva and the Roman, Turnus Rufus, are presented as debating a major philosophical issue: if God has decreed that a person be poor, who are we to interfere and give them tzedaka?! Similarly, if people are ill or unable to have children, who are we to intervene and enable them to have children?! R. Akiva answers that, as His children, God wants us to be actively involved in helping one another.

5. פילוסופוס אחד שאל את רבי הושעיה. א"ל - אם חביבה היא המילה מפני מה לא נתנה לאדם הראשון? א"ל ... כל מה שנברא בששת ימי בראשית צריכין עשייה. כגון החרדל צריך למתוק, התורמוסים צריך למתוק, החיטין צריכין להטחון. אפילו אדם צריך תיקון!

בראשית רבה פרשה יאו

More fundamentally, God put us in this world for the purposes of 'tikun olam' - perfecting His creation. Thus He left us to carry out brit mila. So too, we are required to be involved in helping to cure infertility.

6. וַיִּבְרָךְ אֱלֹהִים וַיֹּאמֶר לָהֶם אֱלֹהִים פְּרוּ וּרְבוּ וּמְלֵאוּ אֶת-הָאָרֶץ וּכְבֹשְׁהָ וּרְדוּ בְּדַגַּת הַיָּם וּבְעוֹף הַשָּׁמַיִם וּבְכָל-חַיַּה הַרְמֵשֶׁת עַל-הָאָרֶץ.

בראשית א-כח

Mankind is created with a mandate to fill, conquer and subdue the natural world.

7. לשון 'מלאו' הוא על השלמת חסרון בדבר וכו'. והנה האדם שהיה האחרון בבריאה, אף שהיה מוצא הכל מוכן לפניו כל מיני דשאים תבואות ופירות האילן, מכל מקום היה קשה עליו ליהנות מהם כי היה חסר מכל מיני כלים וכו'. לכן היתה הברכה ממנו ית' לתת לו דעת ותבונה להמציא לעצמו תחבולות אשר באמצעותם יוכל להשלים כל חסרונותיו אלה וכו'. ... הנה על השלמת חסרונותיו אלה אמר 'ומלאו את הארץ' - השלימו לעצמיכם דברים החסרים לכם בעולם וכו'. ברכה זו היא גדולה מאד שיוכל להמציא לו כלים מכלים שונים להקל באמצעותם עבודתו ... אמנם טובה זו היא גדולה מצד גופו, אמנם מצד נפשו יש בזה צד רע

הכתב והקבלה שם

R. Ya'akov Mecklenburg (19C Germany) understood that mankind was instructed to innovate and create in the world so as to enable him to fully benefit from it. However, this physical achievement can come at a spiritual price!

D3] THE BOUNDARIES OF 'HEALING'

8. וְכִי יִרְיֵב אֲנָשִׁים וְהָיָה אִישׁ אֶת רֵעֵהוּ בְּאָבֶן אוּ בְּאֶגְרֵף וְלֹא יָמוּת וְנָפַל לְמִשְׁכָּב: אִם יָקוּם וְהִתְהַלֵּךְ בְּחוּץ עַל מִשְׁעָנָתוֹ וְנָקָה הַמִּפְקָה רַק שְׁבִתוֹ יִתֵּן וְרָפָא יִרְפָּא.

שמות כא-יח-יט

The Torah includes an imperative to heal a person who has been injured.

9. דבי ר' ישמעאל אומר: (שמות כא) וְרָפָא יִרְפָּא - מכאן שניתן רשות לרופא לרפאות (רש"י - ולא אמרין 'רחמנא מחי ואיכו מסי').

בבא קמא פה.

Chazal saw this as 'permission' to heal. Rashi explains that a person may have thought to adopt a theological position that God made this person sick and thus will heal them if He wishes. The Torah is negating this position. We must heal where we can. Nevertheless, our permission to intervene depends on such intervention being an act of 'refua'.⁶

6. R. Moshe Feinstein refused to allow a healthy person to have an IV drip on Yom Kippur to enable them to fast. Such an intervention went beyond the remit of 'refua'. (Igrot Moshe O.C. 3:90).

D4] THE BOUNDARIES OF 'NATURE'

10. וענין הכישוף הוא לפי דעתי כן, שהשם ברוך הוא שם בתחילת הבריאה לכל דבר ודבר מדברי העולם טבע לפעול פעולתו טובה וישרה לטובת בני העולם אשר ברא. וציוה כל אחד לפעול פעלו למינהו ובמלאכת התערבות יש בה צדדין שלא הורשו בני אדם להשתמש בהן. כי יודע אלהים שסוף המעשה היוצא לבני אדם באותן צדדין רע להן ומפני זה מנעם מהם.

ספר החינוך מצוה טב

The mitzva prohibiting witchcraft has at its heart a warning that mankind must not cross the boundaries of the natural world. Any attempt to do so will only lead us into negativity.

However, according to many rationalists in the Rishonim - lead by the Rambam - witchcraft is not a 'real' expression of a 'dark side'. It is a fake smokescreen for idolatry used to beguile gullible followers. Modern technology is not connected with idolatry. And even according to those Rishonim - lead by the Ramban - who DO accept the reality of a 'dark side' and the occult, it is accepted that this means invoking powers of negativity and destruction, not healing.

11. אביי ורבה דאמרי תרוייהו: כל דבר שיש בו משום רפואה - אין בו משום דרכי האמורי.

שבת טז.

We are not concerned with the occult if the focus of a procedure is healing.

12. כל שהוא נעשה בפעולה טבעית אינו בכלל כשפים אפילו ידעו לברא בריות יפות שלא מזווג המין, כמו שנודע בספרי הטבע שאין הדבר נמנע רשאים לעשות. שכל שהוא טבעי אינו בכלל הכשוף ודומה ליה שיש בו משום רפואה אין בו משום דרכי האמורי.

בית הבחירה (מאירי) סנהדרין טז:

The Meiri writes that creation of life through natural means, but without human reproduction, will not be prohibited.

13. כי השם ברוך הוא ברא עולמו בחכמה בתבונה ובדעת ... ובהיות יודע אלהים כי כל אשר עשה הוא מכוון בשלימות לענינו שהוא צריך בעולמו, צוה לכל מין ומין להיות עושה פירותיו למינהו, כמו שכתוב בסדר בראשית. ולא יתערבו המינים פן יחסר שלימותן ולא יצוה עליהן ברכתו

ספר החינוך מצוה רמד

God, in His wisdom, created the world with full potential with its species. We are not allowed to mix these - 'kilayim' - as this detracts from the perfection and blessing of Creation.

14. הטבע הוא משובח מאד במקומו הראוי לו. וכשהמלאכותיות נכנסת במקום הטבע היא מקלקלת אותו. והנה אע"פ שהש"י ברא את העולם לעשות לשכלל ולתקן, מכל מקום צריך האדם בזהירות יתירה לעיין שרק ישכלל את הטבע שהיא מתנת ... אבל כשמהרס אל מקום שהטבע צריך לעשות את שלו, ומקלקלו ע"י מה שעוצר בעדו, אז הוא גומל לנפשו רעה. על כן הגבילה תורה את יכולת האדם בשינוי הדברים הטבעיים ואמרה: 'בהמתן לא תרביע כלאים, שדך לא תזרע כלאים ובגד כלאים שעטנו לא יעלה עליך', 'לא תזרע כרמך כלאים'. כל זה להשריש בלב האדם את החיוב להיזהר שלא להרס את הטבע.

אצרות הראיה ח"ב עמ' 901

Rav Kook stresses the importance of defining the boundary between enhancing nature and undermining nature.

- However, other Rishonim understand kilayim in very different ways⁷. Also, do these sensitivities apply to humankind as a whole?

15. דתניא רבי יוסי אומר: שני דברים עלו במחשבה ליבראות בערב שבת ולא נבראו עד מוצאי שבת, ובמוצאי שבת נתן הקדוש ברוך הוא דיעה באדם הראשון מעין דוגמא של מעלה. והביא שני אבנים וטחנן זו בזו ויצא מהן אור. והביא שתי בהמות והרכיב זו בזו ויצא מהן פרד.

פסחים נד.

God held back from some aspects of Creation, which he left for humankind's technological achievement. This is expressed as Adam inventing fire and cross-breeding animals at the beginning of the first 'working week'.

16. וְאֵלֶּה בְּנֵי־צִבְעוֹן וְאֵינָהּ וְעֵנָה הוּא עֵנָה אֲשֶׁר מָצָא אֶת־הַיְמִים בְּמִדְבָּר בְּרֵעֵתוֹ אֶת־הַחֲמָרִים לְצִבְעוֹן אָבִיו.

בראשית לו:כד

In the account of the generations of Seir at the end of Parashat Vayishlach, there is a strange account of how Ana discovered the 'yeimim' in the desert, when he was looking after his father's donkeys.

7. For the Rambam, it is intended to distance us from Avoda Zara.

17. האש והכלאים אף על פי שלא נבראו מששת ימי בראשית אבל עלו במחשבה מששת ימי בראשית. הכלאים (בראשית ל:כד) ובני צבעון איה וענה הוא ענה אשר מצא את היימים במדבר. מהו יימים? ... חציו סוס וחציו חמור. ... מה עשה צבעון וענה? זימן חמורה והעלה עליה סוס זכר ויצא מהן פרדה. אמר הקדוש ברוך הוא להם אתם הבאתם לעולם דבר שהוא מזיקן אף אני מביא על אותו האיש דבר שהוא מזיקו. מה עשה הקדוש ברוך הוא? זימן חכינה והעלה עליה חרדון⁸ ויצא ממנה חברבר⁹.

תלמוד ירושלמי (וילנא) מסכת ברכות פרק ח

The Yerushalmi sees this as a warning against cross-breeding and the inadvertent creation of a more dangerous world.

- According to the Yerushalmi, the possibility of cross-breeding was built into the natural order of Creation in potential from the six days of Creation - עלו במחשבה. Yet Ana was still culpable for releasing this into the world. Evidently, the fact that something is possible within the laws of nature, does not mean that it should be done.
- The unexpected consequence of Ana's experimentation is the creation of an entirely new and dangerous lizard. Could this be a mashal for the dangers of tampering with some elements of nature and the risks of dangerous inadvertent side-effects?
- Can this Midrash be harmonized with that dealing with Adam on Motzei Shabbat? Chazal in Pesachim 54a comment that Ana produced a negative result because he himself came from an illegitimate and negative background. Is the Gemara communicating that one's motivation and background¹⁰ is crucial in assessing whether technological innovation is legitimate?

D5] WHO CREATES A CHILD?

18. תנו רבנן: שלשה שותפין יש באדם, הקדוש ברוך הוא ואביו ואמו. אביו מזריע הלובן, שממנו עצמות וגידים וצפרנים, ומוח שבראשו, ולובן שבעין. אמו מזרעת אודם, שממנו עור ובשר ושערות, ושחור שבעין. והקב"ה נותן בו רוח ונשמה וקלסתר פנים, וראיית העין, ושמיעת האוזן, ודבור פה, והלוח רגלים, ובניה והשכל

נדה לא.

Three partners produce a child - mother, father and God. We must recognize the boundaries of our role in reproduction.

E] THE HALACHIC STATUS OF UNIMPLANTED EMBRYOS

19. אמר רב חסדא: ... עד ארבעים מיה בעלמא היא

יבמות סט.

Chazal explain that, until 40 days gestation, the embryo is considered halachically as mere 'bodily fluids' of the mother. Nevertheless, since it is a potential life, it may not be terminated without strong halachic justification.

20. (בראשית ט:ו) שִׁפְךָ דַּם הָאָדָם בְּאָדָם דָּמוֹ יִשְׁפָּךְ כִּי בְצַלֵּם אֱלֹקִים עָשָׂה אֶת-הָאָדָם, איזהו אדם שהוא באדם - הוי אומר זה עובר שבמעו אמו.

סנהדרין נז.

A fertilized embryo which is still in a lab and has not yet been implanted in the uterus, is not yet considered to be an אדם שהוא באדם. In this sense it is even less of a potential life, as it could never develop in the lab into a viable fetus. As such, most poskim are lenient in allowing such embryos to be discarded where there is a real medical need, especially if the discarded embryo is itself defective.

21.

והנה כב' כותב "שבכית החולים הנמצא באחת השכונות המרכזיות ליהודים חרדים בניו-יורק, ושכב' הוא יו"ר בפועל במחלקה לפרוריות האשה" אתם עוסקים בהפריית מבחנה, וכנראה שקיבלתם דעת המתירים. ועל כן אבוא להשיבו על עיקר שאלתו, שכל הכיציות שהופרו בזמן שהן במבחנה, אין עליהן כלל ועיקר דין עובר, ואין מחללין עליהן את השבת⁵, ומותר לזורקן אם לא נבחרו להשתלה, משום שאין דין הפלה אלא מרחם אשה דוקא. כך הוא הדין לגבי ישראל, והוא הדין לגויים, אף שגם לגביהם שייך איסור הפלה ואפילו תוך ארבעים יום, אבל במבחנה אין כאמור איסור כלל.

רב חיים דוד הלוי - על דילול עוברים והמעמד ההלכתי של עוברים מבחנה, אסיא מז-מח כסלו תשנ"ו 15

R. Chaim David HaLevi explicitly permits the discarding of embryos which will not be used for implantation.

8. A female snake and a male toad.

9. A highly poisonous lizard.

10. Rav Dessler (Michtav Me'Eliyahu Vol 1 p 270) write that Tuval Kayin (see Bereishit 4:22) is blamed not for the development of new metal technology but for his unwillingness to safeguard that technology, which resulted in the development of weapons.

F] PGD AND SELECTION OF EMBRYOS

- Pre-implantation Genetic Diagnosis (PGD) can be medically undertaken in conjunction with In Vitro Fertilization (IVF) for various reasons. A cell is removed from the embryo around day 4 or 5 (which is not harmful to the embryo¹¹) and tested. Based on the PGD (which is highly accurate), some embryos can be selected for implantation and others can be either frozen for possible future use¹², or discarded.
- Most poskim are against elective PGD¹³ but will permit it in specific circumstances - medical, halachic and relating to shalom bayit¹⁴. R. Yosef Shalom Eliyashiv ruled that PGD is acceptable for medical but not for 'cosmetic' reasons. How is that to be defined?

F1] SELECTION TO AVOID GENETIC DEFECTS

- PGD to identify genetic abnormalities is accepted by most poskim¹⁵. Healthy embryos will be implanted and the defective embryo may be discarded.
- What is considered to be an 'abnormality'? Cases which will inevitably result in an illness such as Tay Sachs¹⁶ are clear. What about Downs Syndrome¹⁷, which is not life-threatening in the same way as Tay Sachs?
- Other cases are less clear. Sometimes the doctors are not sure if the abnormality will indeed be present if the embryo develops.
- What about PGS - Pre-implantation Genetic Screening? Here, the embryo may be screened to see if carries certain genetic markers. Although these do not necessarily indicate an disease in the embryo, these markers indicate an increased statistical likelihood of diseases (eg certain cancers) developing later in life¹⁸. Would it be legitimate to discard embryos simply because they may (but may not) go on to develop diseases later in life. Even if they develop those diseases, what might be the treatment available at that future time? Are we eradicating a real problem? Is this considered to be 'refua'? What about the concept of '*shomer petaim Hashem*' - that we must have *bitachon* and trust in God in situations of normal life risk.
- What if the couple want PGD in order to have a child WITH an abnormality. Eg two deaf parents want a child who is deaf or two parents with dwarfism who want a child who is also a dwarf. In such scenarios whose interests are halachically paramount - the parents' or the child's?
- We want to avoid 'unhealthy' offspring - hence genetic screening programs such as Dor Yeshorim.¹⁹ Nevertheless, even if person is sick, they could have a major purpose in the world. Consider how certain individuals have been energized by their illness to bring great things to the world. We can never know the crucial role that such people may have in the grand plan for the world.²⁰
- Could there be a downside to eradicating sickness? Do certain illnesses produce immunity in society as a whole, even if individuals die? Are there unexpected side effects which we could not anticipate?
- Could there be a halachic OBLIGATION to have PGD or can one decide to bring sick children into the world? Could the mitzva of *לא תעמוד על דם רעך* - not to stand by when others may suffer - apply to the unborn child?

F2] SELECTION TO CHOSE A BOY OR GIRL

- Is it ever justifiable to select and discard embryos on the bases of the sex of the child²¹?
- Consider the following (real) halachic scenarios²²:

11. At least as far as we are aware!

12. Cryopreservation suspends fetal development and allows a fertilized egg to be kept almost indefinitely for future use - either for stem cell research or pregnancy.

13. See <https://www.puahfertility.org/articles/preimplantation-genetic-diagnosis-pgd/>

14. R. Shlomo Amar (in correspondence to Machon Puah) permitted PGD in certain situations for genetic reasons, to fulfil *peru u'revu* and for shalom bayit, but not to 'balance' families.

15. Ashkenazim have the highest number of genetic abnormalities (93) of any minority in the world.

16. This can be picked up in PGD as an abnormality in the 15th chromosome.

17. This can be picked up as an abnormality of a set of 3 chromosomes in the 21st 'pair'.

18. This could apply to people who have the BRCA genetic mutation, which is much higher for women in the Ashkenazi community.

19. This is of great help for Ashkenazi families, but less so for marriages outside the Ashkenazi community. (Sefardim have their own common genetic disorders) Also, Dor Yeshorim is effective only for recessive abnormalities (which can only be passed on if both parents are carriers) but not for dominant abnormalities (which can be passed on if even one parent is a carrier).

20. Consider the Gemara in Berachot 10a which sets out the conversation between Chizkiyahu and Yeshayahu concerning Chizkiyahu's unwillingness to marry and have a child - Menashe - whom he knew would be evil.

21. Note that Chazal give various suggestions for people who wish to have a boy eg being careful about Havdala (Shavuot 18b), giving generously to tzedaka (Bava Batra 10b) and others (ibid). Leaving aside whether these are medically effective, it seems that gender selection is acceptable to some degree.

22. For a selection of Rabbinic responses on this see

(a) <http://www.yutorah.org/download.cfm?materialID=522530>

- (i) Where the father is a Cohen and produces no sperm. The only way they can have a child is through AID - Artificial Insemination by Donor. The child will be Jewish but will NOT be a Cohen. The family therefore want a girl to avoid public embarrassment.
- (ii) Where the father has no sperm and AID is necessary. If that family follows a psak that yichud and negia is only permitted with a blood relative²³, the father will have major domestic problems if they have a girl. Thus they want to have a boy.²⁴
- (iii) The family have many children of one sex and one of the parents has become severely depressed because of this.²⁵
- (iv) The family have many children of one sex and wish to fulfil the mitzva of peru u'revu by having a girl and a boy.²⁶

- What if the family have an 'unbalanced' mix of boys and girls and want to 'balance' the family.
- Some societies favor boys for social reasons. Can that ever be condoned?
- Are we worried about producing a society with a very skewed ratio of boys and girls.

F3] THE SLIPPERY SLOPE - ARE WE HEADING FOR A NIGHTMARE FUTURE?

- Is there a real concern of 'designer babies'? Is it problem if people want babies with blue eyes or curly hair, or who are more sporty or more musical? Halachically there will be more of a concern at discarding the embryos. Why would the secular world have an issue with this when abortion at will is often permitted?
- Some are concerned that the ability to produce 'superhumans' will be available only to the rich and is thus unethical. But how is this different to other lifestyle, health or education options which are currently only available to the wealthy?
- Some are fearful of eugenics - that superhumans may be produced who will be able to dominate others, or super-armies of people who will win wars. Are these real medical possibilities in the foreseeable future?

22. אכן, אף כי באופן עקרוני אמנם מותרת ההתערבות בבריאה אך הדבר מותר דווקא אם מתקיימים שלשה תנאים הכרחיים: (א) אין איסור הלכתי מהותי בעצם פעולת השכלול; (ב) אין לפעולת השכלול תוצאה הכרחית אסורה שאיננה ניתנת למניעה ו/או לתיקון; (ג) יש תועלת לבני אדם בפעולת השכלול, ובלבד שהתועלת עולה על הנזק.

הרב דר. אברהם שטינברג - היחס העקרוני האמוני/השקפתי, מוסרי/התנהגותי והלכתי/משפטי לחידושים מדעיים

R. Avraham Steinberg sets out a three-part test for defining the limits of legitimate medical intervention: (i) it must not be halachically prohibited; (ii) it must not have any secondary consequences which are halachically prohibited unless these can be avoided or ameliorated; (iii) there is an overall human benefit to the activity, which is not outweighed by any consequent damage.

23. אמר רבא: בשעה שמכניסין אדם לדין אומרים לו: נשאת ונתת באמונה? קבעת עתים לתורה? עסקת בפריה ורביה? צפית לישועה? פלפלת בחכמה? הבנת דבר מתוך דבר?

שבת לא.

Chazal state that, when we give account for our lives in the Next World, we will be asked if we TRIED to have children, not if we succeeded. Sometimes, success in this area is beyond our control.

24. צר לי שאתם מתעסקים בעניינים שנסתרים מאתנו. תפקידכם לעזור לאנשים בענייני אישות, ולא בעניינים כאלה. ועוד - אנחנו צריכים לעשות את שלנו, והשאר בידי הקב"ה. אגב, תעיין בספריו של פרופ' אברהם שהוא מביא מכתב מהגרל"ז אוירבך זצ"ל.

מכתב הרב י. נויבירט למכון פועה (2003)

*R. Yehoshua Neuwirth responded negatively to Machon PUAH's enquiry about PGD, indicating that in most cases such treatments were beyond the scope of legitimate human involvement.*²⁷

(b) <http://www.yutorah.org/lectures/lecture.cfm/847270/rabbi-dr-kenneth-brander-dr-lawrence-grunfeld/pgd-for-optimizing-chances-for-success-in-ivf-playing-god-can-i-choose-my-child-/>

(c) <https://www.yutorah.org/lectures/lecture.cfm/713523/> and <https://www.yutorah.org/download.cfm?materialID=503290>

(d) Sex Selection and Halakhic Ethics - Tradition 40:1 (2007) p45

(e) A Boy or Girl? The Ethics of Preconception, Rabbi Joshua Flug, The Journal of Halacha and Contemporary Society XLVIII (Fall 2004) p5.

23. R. Moshe Feinstein was lenient if the 'adopted' child came into the family at an early enough age to relate to the adopters as regular parents. However others, notably the Lubavitcher Rebbe, were strict on this.

24. R. Yigal Shafran, Director of the Jerusalem Rabbanut's Department of Medicine and Halacha took the view that PGD was justified in this case and that it would come under the rubric of cases permitted by R. Shlomo Zalman Auerbach.

25. See <https://www.puahfertility.org/articles/preimplantation-genetic-diagnosis-pgd/where-the-case-is-presented-as-follows/>

A family with 5 children of one gender consulted PUAH. The father was under psychological care because of severe depression at having single gendered offspring. The depression was so severe that it prevented him from interacting with his children and functioning as a parent to them and husband to his wife. While extended psychological treatment was a viable option, the psychologist also felt that having a gender selected child could also treat the problem. After consulting with the psychologist and PUAH counselor, their Rabbi determined that the incapacity in this case was so severe that it permitted gender selection for their 6th pregnancy. The treatment was successful and the father is fully participant as a parent for ALL his children and no longer requires psychological care.

26. R. Ovadia Yosef permitted PGD after 6 same-sex children. R. Mordechai Eliyahu permitted it after 5.

27. The reference to Nishmat Avraham is Hilchot Piriya v' Riviya 1:5 where R. Auerbach permitted selection of sperm in the case of hemophilia to remove male (Y) sperm and retain female (X) sperm to prevent the genetic transmission of the disease. R. Neuwirth appears to extend this to embryo selection to prevent genetic diseases, or at least those of similar severity.

APPENDIX: ABORTION - A POSTSCRIPT

25. Let me conclude this overview with two remarks. First, the reader has surely discerned that in a number of places I have refrained from setting down definitive conclusions, but have been satisfied to indicate general principles, tendencies and possibilities in the Halakha. These are areas where, on the one hand, the halakhic details are not clearly fleshed out in the Talmud and Rishonim, and, on the other hand, the personal circumstances are often complex and perplexing. In such areas there is room and, in my opinion, an obligation for a measure of flexibility. A sensitive posek recognizes both the gravity of the personal situation and the seriousness of the halakhic factors. In one case, therefore, he may tend to view the points of contention in one way, while in a second case exhibiting slightly different details, he may tilt the decision on these points in the other direction. He may reach a different kind of equilibrium in assessing the views of his predecessors, sometimes allowing far-reaching positions to carry great weight, while in other cases ignoring them completely. He might stretch the halakhic limits of leniency where serious domestic tragedy looms, or hold firm to the strict interpretation of the law when, as he reads the situation, the pressure for leniency stems from frivolous attitudes and reflects a debased moral compass. This approach is neither evasive nor discriminatory. The flexibility arises from a recognition that halakhic rulings are not, and should not be, the output of human microcomputers, but of thinking human beings; a recognition that these rulings must be applied to concrete situations with a bold effort to achieve the optimal moral and halakhic balance among the various factors.

.....

Despite this emphasis, I imagine that some may view the ideas presented above as, overall, excessively severe and inflexible. Hence my second concluding remark. Judged by the standard prevalent today in most of the world, at least the Western world, the halakhic approach presented here appears rather stringent. This requires no apologetics. But it is worth making clear, certainly to those who, in seeking a humane approach, are liable to adopt slavishly an overly liberal attitude in this area, that from the perspective of the fetus and those concerned with its welfare, liberality in this direction comes at the expense of humanity, insofar as the caution of the Halakha is tied to its intimate concern for the values of kindness and mercy. It is not only the honor of God which obligates us, regardless of the cost, to avoid what is prohibited and to obey the commands of the Holy One Blessed be He that are expressed in this Halakha. It is also the honor of man in Halakha, the humane and ethical element which insists on the preservation of human dignity and concern for human welfare, that rises up in indignation against the torrent of abortions. If the Halakha's course is sometimes onerous for certain families or for those responsible for them-and this fact should neither be denied nor ignored-let us remember, paraphrasing the famous words of Byron, that Halakha loved not the parents less, but the child more.

Abortion: A Halakhic Perspective - R. Aharon Lichtenstein, Tradition 25(4), Summer 1991 p3²⁸