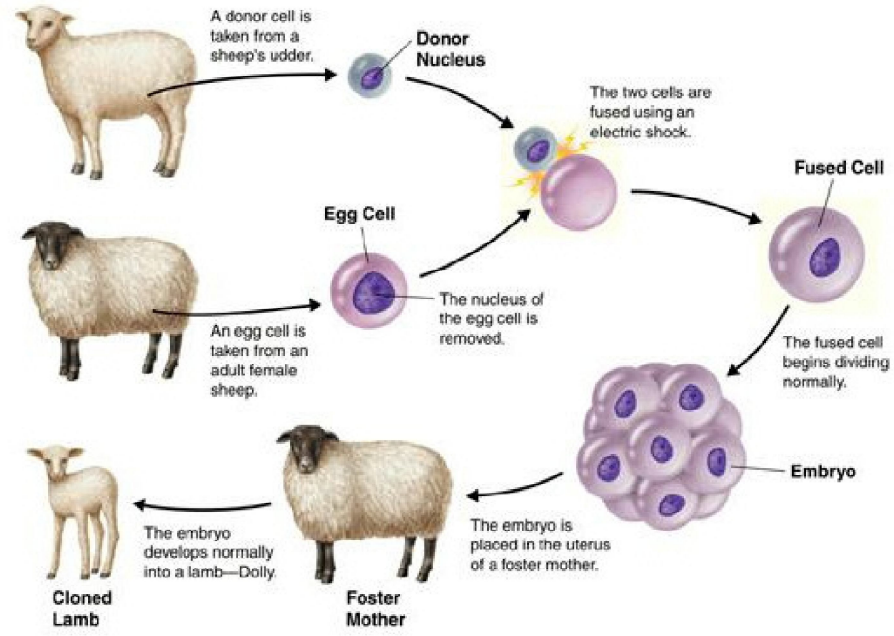
HALACHIC AND HASHKAFIC ISSUES IN CONTEMPORARY SOCIETY

SERIES 2: 26 - JUDAISM AND THE UNBORN CHILD: HUMAN CLONING

OU ISRAEL CENTER - SPRING 2022

A] HOW DOES CLONING WORK?



1. How are animals cloned? In reproductive cloning, researchers remove a mature somatic cell, such as a skin cell, from an animal that they wish to copy. They then transfer the DNA of the donor animal's somatic cell into an egg cell, or oocyte, that has had its own DNA-containing nucleus removed.
   Researchers can add the DNA from the somatic cell to the empty egg in two different ways. In the first method, they remove the DNA-containing nucleus of the somatic cell with a needle and inject it into the empty egg. In the second approach, they use an electrical current to fuse the entire somatic cell with the empty egg.
   In both processes, the egg is allowed to develop into an early-stage embryo in the test-tube and then is implanted into the womb of an adult female animal.
   Ultimately, the adult female gives birth to an animal that has the same genetic make up as the animal that donated the somatic cell. This young animal is referred to as a clone. Reproductive cloning may require the use of a surrogate mother to allow development of the cloned embryo, as was the case for the most famous cloned organism, Dolly the sheep.

The National Human Genome Research Institute[1]

There are therefore 3 contributors to cloning: the gene donor, the egg donor and the gestational carrier.

The Gene Donor - could be a man or a woman
The Egg Donor - must be a woman BUT cloning may now be possible without eggs, using stem cells which could be from a man.
The Gestational Carrier - must be a woman although there may come a point at which an artificial womb is developed which can gestate a fetus without the need for a woman.

1. https://www.genome.gov/25020028/cloning-fact-sheet/

B] WHICH ANIMALS HAVE BEEN CLONED?

The following animals have been successfully cloned:
frog (1952), carp (1963), mouse (1986), sheep (Dolly - 1996), domestic cattle (1997), pig (2000), goat (2001), cat (2001), horse (2003), mule (2003), rabbit (2003[2]), ibex (2003), rat (2003), arctic wolf (2005), deer (2003), dog (2005), fruit fly (2005), rhesus monkey (2007), camel (2009), coyote (2011), macaque monkey[3](2017).

- Although the Human Genome was mapped in 2000, no humans are known to have been cloned and in most countries this is illegal.
- However, hundreds of thousands of cloned animals are now produced annually. These are used in a number of ways[4], including:
  - high quality breeding stock which go on to produce offspring normally. Those offspring, rather than the cloned stock, are usually used for food.
  - cloning endangered species[5]
  - cloning pets (which can cost up to $100,000 and is not particularly efficient)
  - cloning work animals - eg sniffer dogs
  - cloning sports animals - eg horses
- Meat produced through cloning is now FDA approved[6].

C] GENERAL BENEFITS AND DANGERS

BENEFITS

- Stem Cell development - embryonic stem cells from clones can be used to research and cure diseases eg 'insulin factories' for diabetics, renewal of cell activity by introducing cloned cells to cure Parkinson's or Alzheimer's Disease, regenerating a failing liver or kidney. These embryos are not implanted for pregnancy but used to 'grow' stem cells.
- This can also be done by creating chimeras - mixtures of genes from different species eg inserting a human nucleus into a rabbit or mouse egg.
- Organ Replacement - cloning technology can be used to create genetically engineered animal organs which are immunologically compatible with humans.[7]
- Correcting genetic diseases - by correcting mutated genes and then cloning the 'fixed' outcome.
- Livestock production. There are plans to clone millions of animals annually for food production.
- Assisting with infertility - if one or both of the couple were unable to produce viable gametes - eggs/sperm. One of them could use their own genetic material to produce a cloned child. This would removed the need for donor sperm or eggs.
- Assisting with genetic diseases eg if a woman carries a mitochondrial genetic mutation which causes disease in the children, she could use a donor egg with healthy mitochondria and introduce a nucleus from her own body. That way the child will be 99% genetically hers but with healthy mitochondrial DNA.
- Assisting a woman who is perimenopausal with eggs which are not capable of successful fertilization and implantation. Rather than receiving an egg donation from another woman, she could take a enucleated egg from a donor, insert a nucleus from her own egg and then do IVF with her husband's sperm to conceive a child which would be 99.5% that of her and her husband.
- Restoring a dying/deceased child/relative - live cells could be collected even shortly after death which could be used to create a clone, which could be implanted.
- Restoring extinct species - currently science fiction as adult donor cells are normally needed.

DANGERS

- Cloning technology is still new. Many attempts to clone embryos go wrong. Dolly the sheep was only produces after 276 failed attempts. Non-viable embryos will be created as well as embryos with severe deformities.
- Meat from cloned animals is on the market. Will there be unknown health hazards from this meat? The FDA say not, although most 'cloned' meat on the market is made by breeding cloned animals with regular stock in the normal way. Is this any more of a concern with cloning that with some other modern food technology methods.

2. This includes rabbits that glow in the dark!
3. https://www.nationalgeographic.com/science/article/monkey-clones-dolly-sheep-china-medicine-science
4. Seehttps://www.sciencefocus.com/nature/rise-of-the-clones-7-ways-cloning-is-already-happening/
5. There are also realistic plans to clone extinct animals, such as woolly mammoths, but not yet dinosaurs!
6. https://www.fda.gov/animal-veterinary/animal-cloning/primer-cloning-and-its-use-livestock-operations
7. The New York Times reported on Aug 10 2017 that a combination of gene therapy and cloning had been used to grow pig organs which were more compatible for human transplant. The original pig DNA had been manipulated to remove genes which cause viruses in humans. The repaired pig nuclei were then cloned to produce embryonic pigs which could be grown for organs.

• Would human cloning reduce the gene pool in a damaging way?
• There would be a grave concern if people were to be cloned to use as slaves or for human experimentation.
• What about producing a clone in order to grow organs or to be a bone-marrow donor to save the life of the clonor. Some ethicists object to the concept of producing a 'donor child' as a form of servitude. When is it appropriate for parents to make decisions which risk one child to help another[8]? Why is hashkafically problematic to bring a child into the world who will start life as a ba'al chesed and save others?

D] HALACHIC AND HASHKAFIC BENEFITS AND DANGERS

• In the last shiur we looked in some detail at the meta-halachic and hashkafic perspectives on technological change and the unclear boundaries between being an active partner with God in creation and over-stepping the limits of 'healing'.

2. 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 a overall human benefit to the activity, which is not outweighed by any consequent damage.

• In any situation where one is trying to assess the halachic propriety of any action it is not simply a binary analysis of mutar/assur - permitted/prohibited. There are at least **5** possible halachic positions: (i) Assur - prohibited; (ii) Mutar - permitted *bedieved* but undesirable; (iii) Mutar and neutral; (iv) Mitzva kiyumit - permitted and desirable; (v) Chiyuv - obligatory.

BENEFITS

• Cloning could provide some halachic advantages over AIH (Artificial Insemination by Husband) and AID (Artificial Insemination by Donor) including: (i) halachic problems procuring the sperm; (ii) questions of mamzerut or at least propriety in using sperm from a man other than the husband.

CONCERNS

• Cloning may result in a high number of deformed fetuses and the need for terminations. Also, will cloning result in personality dysfunction or maladjustments? Would this be any more problematic than other stressful family situations?
• Even where an action is technically permitted, the Rabbis of a specific community have the ability to advise or even require that their community should not do that.
• In situations which may be technically permitted but not mitzvot, should we be invoking the concepts of *lifnim mishurat hadin* or *naval b'rshut haTorah?*
• Is procreation meant to be the bonding of two individuals - either by natural conception or by the bonding or their seed outside the body (IVF)? Cloning may be duplication rather than procreation. If so, is it within our remit?[9]

3. 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 לזה שיש בו משום רפואה אין בו משום דרכי האמורי.

בית הבחירה (מאירי) סנהדרין סז:

The Meiri writes that creation of life through natural means, even without human reproduction, is not prohibited.

8. This question is not only relevant to cloning. Babies may be conceived in order to use their stem cells to save the life of older siblings - see https://www.theguardian.com/science/2000/oct/04/genetics.internationalnews. What if the baby's life or health was put at risk through such a procedure?
9. R. Eliezer Waldenburg (Tzitz Eliezer 15:45:4) and R. Yosef Shalom Eliashiv (see Torah U'Madda Journal 9:195 and 216) are very clearly against cloning on the ground that it crossed the line of acceptable human involvement in creation. R. J. David Bleich (Tradition Spring 1998) and R. Moshe Tendler (letter to the New York Times Dec 12 1997) are prepared to accept cloning where properly monitored and controlled.

E] HOW MANY PARENTS SHOULD A CHILD HAVE?

4. 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, והלוך רגלים, ובינה והשכל.

נדה לא.

Three partners produce a child - mother, father and God. God is responsible for the unique face of the individual.

- Does this source indicate that the father-mother model of procreation is obligatory, or merely recommended?
- Is it legitimate to create a child which does not have a father and a mother?
- Bedieved, there are many situations of children growing up without two parents, eg after divorce or bereavement. Most of these children grow up in loving homes and become happy and balanced people. But should we create such scenarios 'lechatchila'?
- Consider the issue of older single women who are unable to find a marriage partner and who want to have a child through AID before it's too late. Many senior poskim were very unhappy with such a scenario on the basis that this is not the way that children are meant to be brought into the world and raised in a Jewish family.[10] There is no 'right' to have children in Judaism. But to what extent are we anyway dealing with a bedieved situation? Even if this is not the ideal format of a Jewish family, the reality is far from ideal.[11]
- Would the case be different if a wife or other single woman was willing to be impregnated with sperm from a deceased husband/partner and raise the child normally? What is normal?

F] WHO OWNS YOUR GENETIC MATERIAL?

- If seems clear that one may not assault another person to obtain their genetic material by force.
- But what if someone takes genetic material that another person discarded - eg in bodily fluids or skin. Is that hefker?
- Does a person have a kind of 'copyright' ownership over their genetic code?
- What about the genetic material of deceased people? Is this owned by the inheritors? Would these issues be determined by the secular legal position under *dina demalchuta dina?*

G] THE VALUE OF INDIVIDUALITY

5. והמקובלים כתבו טעם לדבר, לפי שכל הנשמות היו בהר סיני, וקבלו דרך מ"ט צינורות ... והן הקולות אשר שמעו וגם ראו. וכל ישראל רואים את הקולות - הן הדעיות - המתחלקות בצינור. כל אחד ראה דרך צינור שלו לפי השגתו וקבל לפי כח נשמתו העליונה לרוב עילוייה או פחיתותה זה רחוק מזה, עד שאחד יגיע לטהור והשני יגיע לקצה האחרון לטמא והשלישי לאמצעות רחוק מן הקצוות והכל אמת ...

הקדמה לס' ים של שלומו מס' ב"ק

We relate to God and understand His message in a uniquely individual way. Although the halachic system sets out common norms for all Jews, ultimately, the fundamental reality of our uniqueness is what makes us a Tzelem Elokim.[12]

6. תנו רבנן: הרואה אוכלוסי ישראל אומר: ברוך חכם הרזים. שאין דעתם דומה זה לזה ואין פרצופיהן דומים זה לזה.

ברכות נח.

Chazal connect the uniqueness of our ideas and thoughts to the uniqueness of our faces!

7. ומפני מה אין פרצופיהן דומין זה לזה? שלא יראה אדם דירה נאה ואשה נאה ויאמר שלי היא ..... תניא היה רבי מאיר אומר: בשלשה דברים אדם משתנה מחבירו: בקול, במראה, ובדעת. בקול ובמראה - משום ערוה (רש"י – שלא יתחלף לאשה בעלה, לא ביום מפני המראה ובלילה מפני הקול), ובדעת - מפני הגזלנין והחמסנין (רש"י – אם יודע מה בלבב חבירו יחפש מלפועיו וידע היכן ממונו).

סנהדרין לח.

Chazal were concerned at the possible breakdown of society if people all looked the same[13]

10. R. Eliezer Waldenburg addresses this in Tzitz Eliezer 15:45:4. R. Shlomo Zalman Auerbach's position can be found in Nishmat Avraham Vol 4, EH 1:3. R. Yosef Sholom Eliashiv also communicated this to R. Avraham Steinberg - see Human Cloning and Halakhic Perspectives, John Loike and R. Avraham Steinberg, Tradition 32:3 p46 n. 35.
11. Consider the case of Capt. Omri Shahar who was killed in a car crash in 2012. His parents fought in the Israeli courts for the right to produce a grandchild through a surrogate mother from sperm taken from their son after his death and planned to raise the child themselves. The State objected on the ground that the child would be subjected to 'planned orphanhood' and would be 'fragile in relation to children from normative families'. The Shahar's won their appeal in the Family Court in 2016 but the Supreme Court overruled that and denied permission to produce the child. There are currently attempts to pass legislation in Israel to permit parents to use their deceased son's sperm in these situations.
12. Rav Soloveitchik understood that a person's awareness of their uniqueness is central to their Avodat Hashem, as is explained in The Lonely Man of Faith. Indeed, Rav Soloveitchik considered that the mitzva of והלכת בדרכיו - to attempt to copy the middot of God - could be fulfilled in this way too. Just as God is entirely unique, so too must a person appreciate the centrality of their own uniqueness.
13. However, clones (like identical twins) would not have the same fingerprints! We would be able to find ways to identify them, but this could still cause confusion and trouble.

8. ומפני מה אין מצויין ת"ח לצאת ת"ח מבניהן? אמר רב יוסף: שלא יאמרו תורה ירושה היא להם.

נדרים פא.

Chazal stress that one cannot 'inherit' Torah. Rav Yosef understands that nurture (social environment) has a bigger role than nature (genetics) in human psychological and moral development.

• Is cloning fundamentally contrary to our focus on individual uniqueness? Or, perhaps, what makes us unique is not just our genes but our unique combination of life experiences. A clone created from an adult cell, implanted and then born, will not turn out the same as the donor - mentally, psychologically, and perhaps even physically eg as a result of different nutrition, diseases and even accidents.

H] SPECIFIC HALACHIC ISSUES ARISING FROM CLONING

H1] CLONING ANIMALS

9. רב חנינא ורב אושעיא הוו יתבי כל מעלי שבתא ועסקי בספר יצירה ומיברו להו עיגלא תילתא ואכלי ליה.

סנהדרין סה:

Rav Chanina and Rav Oshaya created food for Shabbat through non-natural means without concern.

H2] IS A CLONE HUMAN?

• What is needed to create a human being? Is it essential that there be a biological mother and father? In cloning there will probably be a mother - there must a gestational carrier and there will usually be a donor egg[14] and (see below as to who could be the mother). But there does NOT need to be a sperm - the donor egg and DNA could be taken from the same woman.

10. רבא ברא גברא (רש"י - על ידי ספר יצירה שלמדו לרוף אותיות של שם). שדריה לקמיה דרבי זירא. הוה קא משתעי בהדיה, ולא הוה קא מהדר ליה (רש"י - שלא היה בו דבור). אמר ליה: מן חבריא את - הדר לעפריך!

סנהדרין סה:

Rava created a person and sent him to Rabbi Zeira. When it became clear that the person could not talk, Rabbi Zeira destroyed him!

11. **ולא הוה קמהדר ליה כו'**. לפי שכח הנשמה שהוא הדבור לא היה יכול לדבר. ולפי שאין בו הנשמה שהוא הרוח העולה למעלה, רק רוח החיוני שהיא ג"כ נבראה היורדת למטה, מ"ל הדר לעפרך. .... מן חבריא היינו מן החכמים שעוסקין בספר יצירה שדרכן לקרות זה לזה כן כמו הוגה חברין וק"ל.

מהרש"א חידושי אגדות סנהדרין סה:

The Maharsha explains that this creature was not human, since it lacked the power of speech[15], which comes only from God. The creature was created through mystical access to the Sefer Yetzira, but ultimately was a Golem and could be destroyed. As such, his definition of human appears to depend on the power of speech and intellect.

• Clearly, this cannot be the only criterion to define humanity. A person who never had the ability to speak, or who is of very limited intellect, is no less human (ethically or halachically) because of that.

12. **נסתפקתי** אדם הנוצר ע"י ספר יצירה כאותה שאמרו בסנהדרין - רבא ברא גברא - וכן העידו על זקני הגאון מוהר"ר אליהו אבדק"ק חעלם. מי מצטרף לעשרה לדברים הצריכין עשרה כגון קדיש וקדושה? מי אמרינן כיון דכתיב ונתקדשתי בתוך בני ישראל לא מיצטרף או דילמא כיון דקיי"ל בסנהדרין המגדל יתום בתוך ביתו מעה"כ כאילו ילדו ה"נ כיון שמעשה ידיהם של צדיקי' הוא הו"ל בכלל בנ"י שמע"י של צדיקי' הן הן תולדותם?
נ"ל דכיון דאשכחן לר' זירא דאמר 'מן חברי' את תוב לעפרך' הרי שהרגו. ואי ס"ד שיש בו תועלת לצרפו לעשרה לכל דבר שבקדושה לא היה ר' זירא מעבירו מן העולם דאף שאין בו איסור שפיכת דמים דהכי דייק קרא ... *שופך דם האדם באדם דמו ישפך* דוקא אדם הנוצר תוך אדם דהיינו עובר הנוצר במעי אמו הוא דחייב עליה משום שפכ"ד. יצא ההוא גברא דברא רבא שלא נעשה במעי אשה. מ"מ כיון שיש בו תועלת לא היה לו להעבירו מן העולם .....

שו"ת חכם צבי סימן צג[16]

14. As noted above, it may now be possible to stimulate other stem cells to act like ova, which creates the possible of male donation of the enucleated cell.
15. Rabbeinu Bachya (Kad Hakemach Ta'anit) explains that the power of speech is indicative of the power of intellect and this was missing from the golem.
16. Note that the Chacham Zvi does not mention the Golem of the Maharal but rather that of his grandfather, who was a contemporary of the Maharal.

The Chacham Tzvi was initially undecided on the question of whether a Golem may count towards a minyan but leaned towards a ruling that it is prohibited.[17] He defines a human being as someone who was born from a human female. A Golem is not, and thus can be terminated. By such a definition a clone WILL be human and may not be killed.

13. ומני תמיה על הרב ז"ל הגמגם כזה דיש ספק בידו אם בהמה מצטרפת למנין! הרי זה הנוגר על ידי ספר יצירה הוא בהמה בגורת אדם. כי אין כח ע"י ספר יצירה אלא כח חיוני כבהמות ומשו"ה אינו מדבר, כי כח הדברי והדעת הוא מאת ה' דוקא כדכתיב *ויפח בנחיריו נשמת חיים*. וכמ"ש הרב מהרש"א ז"ל בחידושי אגדות .... ואם כן אין ריח ספק אם בהמה מצטרף למנין.

ספר מראית העיין (חיד'א) שם

- But should the halachic definition of 'human' be restricted to a person born from a human womb? What if we develop the technology to incubate an embryo to full term in an artificial womb[18]. Would such a person not be human?
- By this definition, were Adam and Chava human[19]?

14. .... בהמה טהורה שילדה כמין בהמה טמאה מותר באכילה, וטמאה שילדה כמין בהמה טהורה אסור באכילה. שהיוצא מהטמא טמא והיוצא מן הטהור טהור ....

משנה מסכת בכורות פרק א משנה ב

The Mishna defines the halachic status of an animal by reference to its mother. If a kosher animal gave birth to offspring which has non-kosher indications, the offspring is still kosher (and vice versa).[20]

15. Does the cloned product fall under the halachic category of a golem, which does not have the full status of a human being, such that he cannot be counted for a minyan and may even be killed without the killer being guilty of murder? The answer is definitely negative since .... we learn that the prohibition of murder applies specifically to a person who is created within another person - i.e., someone who existed as an embryo within a mother's womb. This is not the case with a golem, who is brought to life by mystical means ..... In the case of cloning we are dealing with the product of purely natural substances, and the child who is born is in fact first a fetus in its mother's womb. Therefore the product of cloning clearly has the same status as any other flesh-and-blood person ....

Human Cloning: Scientific, Ethical And Jewish Perspectives, Prof. Avraham Steinberg & Dr. John. D. Loike[21]

- But what if a human nucleus were fused with an enucleated cow ovum and then gestated in the cow's uterus. It would be born from a cow but looking entirely like a human!!

16. דמר רבי יסא בשם רבי יוחנן - כולו אדם ופניו בהמה אינו וולד, כולו בהמה ופניו אדם וולד הוא. כולו אדם ופניו בהמה עומד וקורא בתורה, ואומרים לו בוא לשחטך!? כולו בהמה ופניו אדם עומד וחורש בשדה, ואומרים לו בוא וחלוץ או ייבם!?

תלמוד ירושלמי (וילנא) מסכת נדה פרק ג הלכה ב

The Talmud Yerushalmi also questions the application of definitions based solely on the origin of the fetus. It explains that, in general, one classifies a creature by its head and not by its body. But this approach will also be overridden by the context and the functionality of the creature.[22]

- If cells to create the clone are taken from a dead donor, would those cells would be considered halachically dead, even if biologically alive? Would this affect the 'live' status of the clone? Could a clone (and its offspring?) be the human equivalent of a *ben pekuah*[23]*?*

17. The Chacham Tzvi's son, R' Meshulam Ashkenazi, writes that his father later clearly ruled that the Golem did not count towards the minyan. This is also the psak of R. Ya'akov Emden and most later poskim. See Mishna Berura 55:4, who simply references the teshuva of the Chacham Tzvi.
18. See https://neo.life/2021/04/a-womb-with-a-view/ by Rachel Lehmann-Haupt, Apr 8, 2021 - "Current artificial womb technology is nowhere near the place it would need to be to accept a fertilized egg and sustain it for an entire pregnancy. The closest scientists have come was described most recently in a March 2021 paper published in the journal Nature. A team of scientists at the Weizmann Institute of Science in Israel led by Jacob Hanna took five-day old embryos from mice uteruses and grew them for six more days in artificial wombs. The wombs were made from glass through which the embryos were supported with a ventilation system and nutrient fluid. A large scientific leap is still needed, however, to get to full gestation, and the Israeli approach has not been tested on human embryos."
19. The Radzhiner Rebbe (Sidrei Taharot, Ohalot 5a) raises this question on the definition of the Chacham Tzvi.
20. R. J David Bleich quotes R. Elchanan Wasserman (Kovetz Ha'arot 8:33) who understands that this principle applies beyond kashrut to all issues halachic status. Thus Rabbi Bleich argues that a clone will be human since it was born from a human mother. A golem is however not human since it was not born from a mother.
21. Available at http://www.daat.ac.il/daat/kitveyet/assia_english/steinberg.htm
22. Note also the discussion in the Mishna Kilayim 8:5 about the Adnei HaSadeh - some kind of 'mountain man', usually identified as an orangutan. Although it is not human, it is not quite a regular animal either. See also R. Akiva Eiger on S.A. YD 2 who discusses the abilities of monkeys when compared to humans. For more on this, mermaids, dolphins and the boundaries between human and animal - see Mysterious Creatures, Rabbi Natan Slifkin, p121 ff.
23. A *ben pekua* is a live calf extracted from a cow who has been shechted. This calf has a halachic status of 'shachut' and does not require further shechita. But it is presumably still halachically 'alive'. What if it damaged or killed property or other people? For more on the ben pekua, including whether it and its milk may be parve see: https://www.theyeshivaworld.com/news/headlines-breaking-stories/374628/the-new-commercially-produced-ben-pkuah-meat.html

H3] DOES PRODUCING A CLONE FULFIL THE MITZVA OF PRU U'REVU?

• What kind of child is halachically required to satisfy the mitzva?[24]

• Are physical sexual relations required? If fertilization is carried out by IVF in a lab, is there sufficient a connection between the sperm donor and the embryo to create paternity?

17. (ח) יש להסתפק מאחר שנתעברה בזמנטו חם קיים כתב פ"ו וחם מקרי בנו לכל דבר ובלקוטי מהרי"ל נמצא שבן סירא היה בנו של ירמיה שרחץ בזמנטו כי סירא בגי' ירמי"הו ...

חלקת מחוקק סימן א ס"ק ח

The Chelkat Mechokek (17C Vilna) questions whether a child conceived through artificial insemination will fulfil the mitzva of pru u'revu.

• Most poskim rule that one DOES fulfil the mitzva of pru u'revu without a sexual relationship (ie through IVF).[25]

• Does there need to be a sperm at all, as in the case of cloning?[26]

• Even if the Torah mitzva of pru u'revu is not fulfilled by cloning, it is possible that the rabbinic mitzva of 'lashevet' - to populate the world - would be satisfied.

H4] WHO ARE THE HALACHIC PARENTS OF A CLONED CHILD?

• This is crucial for many reasons - (i) whether the child is Jewish (ii) to establish who the child is forbidden to marry; (iii) whether the child is a Cohen, Levi or Yisrael; (iv) kibud av v'eim; (v) the laws of yibum; (vi) the laws of inheritance.

• The following people contribute biologically to the production of the clone:

(i) the woman who carries the fetus

(ii) the genetic donor of the nucleus - which determines 99% of the genetic material of the clone.

(iii) the donor of the original enucleated egg/cell. Even though the nucleus was removed, there is still genetic material in the mitochondria which contribute 1% to the genetical material of the clone.

• Is a gestational mother considered the halachic mother? This question is central to halachic issues concerning surrogacy. Many poskim rule that the gestational mother is the halachic mother, or possibly ONE of[27] the halachic mothers, together with the genetic mother. Certainly the gestational mother has a strong claim to halachic maternity.

CASE 1

The same Jewish woman provides all elements - the donor nucleus, the donor egg and she also carries the child. She also contributes 100% of the genetic material. She is clearly the mother and the baby is Jewish. But who is the father? Possible options are:

(a) the father of the mother - ie the grandfather of the clone - who has given half of the genetic material.

(b) the donor of the nucleus - which in this case is the same woman. Could she be the mother AND the father?[28]

(c) the clone has no halachic father. There is halachic precedent for this in the case of a convert or a 'shetuki'[29].

18. רבי יוסי אומר: גר שנתגייר כקטן שנולד דמי

יבמות מח.

The halacha regards a convert as equivalent to a new-born child - an entirely new creation with no halachic parents.

24. It could be that the mitzva is only satisfied if one leaves fertile children when one dies. Simply producing a child is only the beginning and not the ultimate fulfillment of the mitzva. Other poskim (eg R. Moshe Feinstein) take the opposite view - that the mitzva is satisfied simply by **trying** to have children, even if no child is ultimately born. See my shiur on Birth Control at http://www.rabbimanning.com/wp-content/uploads/2016/12/Birth-Control-Part-1.pdf

25. This is the position of R. Ovadia Yosef, R. Shlomo Zalman Auerbach and most other poskim. See R. J. David Bleich, Contemporary Halachic Problems 4:240 fn 9 for a comprehensive list. R. Eliezer Waldenberg (Tzitz Eliezer 15:40) is the key posek who rules against this position and requires introduction of semen directly to the uterus in order for the mitzva to be fulfilled. His view is however a *da'at yachid* on this issue.

26. Rabbi Bleich is doubtful if the mitzva is fulfilled through cloning since there is no insemination. This position may change if the child is cloned from a sperm cell. R. Yitzchak Shilat (Techumin 18:138-140) leans to the view that one does fulfil the mitzva through cloning.

27. R. Shlomo Zalman Auerbach ruled that there may be multiple mothers in a surrogacy scenario!

28. Must a halachic 'father' always be male and a halachic 'mother female? There is very little classic source material which would indicate otherwise. However, the Minchat Chinuch (189:1) discusses a scenario which may be analogous. The halachic category of androgynus (an intersex person displaying both male and female sexual anatomy) is widely discussed in halachic sources and there is significant disagreement as to their gender status. Possibilities include (i) male; (ii) certainly male and female; (iii) doubtfully (safek) male or female; (iv) a third gender; (v) doubtfully (safek) male, female and third gender. The Minchat Chinuch discusses a case where an androgynus fathers a son and then has sexual relations, using through his female rather than male anatomy, with that son. This is certainly a case of incest but is the child considered to be having relations with his father or with his mother!? If the later, the male genetic donor would be halachically considered to be a mother. If so, could a female genetic donor be the father?

29. A shetuki is produced in a situation where the mother had relations with multiple men and is unable to ascertain who the father is, or where the mother refuses to tell the child who the father is. A shetuki is not allowed to marry any Jew in case it is a relative. However, in the case of the shetuki there IS a biological father but we just can't trace him. In the case of the clone there may be no father at all.

CASE 2

Woman A donates the enucleated egg and carries the child. Man A donates the nucleus. Is he the father? Normally a man inputs just under[30] 50% of the genetic material and halachically qualifies as a father. Here, the man is giving 99% - would he not *a fortiori* be the father!? But there is no sperm, so could that still create paternity?

CASE 3

Woman A (Jewish) donates the enucleated egg and carries the fetus. Woman B (not Jewish) donates the nucleus. The clone receives 99% of its genetic material from the non-Jewish donor, but 1% from the Jewish donor AND is born from a Jewish woman. The halachic conclusion will be based on similar considerations as in surrogacy[31].

Consider also a parallel case of a woman who had an ovary transplant and then went on to ovulate, conceive, carry and give birth to a child normally. Even though that woman contribute NO genetic material to the baby, she would almost certainly be classified as the halachic mother.

CASE 4

Woman A donates the enucleated egg, Woman B donates the nucleus and Woman C carries the baby.

It is possible that the clone (as in the case of the surrogate baby) may have multiple halachic mothers. IF genetic material is sufficient to determine maternity, how much is needed? Normally, the woman contributes just over 50%. Here, two women respectively contribute 99% and 1%. One could argue that if 50% is enough, then 99% should be! Of course if BIRTH is the determining halachic factor then genetic input may be irrelevant.

CASE 5

A woman donates the enucleated egg and carries the fetus. The nucleus is donated by her brother. Is this a form of incest? Or does incest require a physical relationship or at least the presence of a sperm (as in AID from a close relative).

CASE 6

A woman donates the enucleated egg and carries the fetus. The nucleus is donated by her sister. Is this a form of incest? The Torah never mentioned incest between a sister and a sister. Is there any such concept?

CASE 7

Man A donates the nucleus and Man B donates the enucleated stem cell which is artificially stimulated to act as an egg. A woman then carries the fetus. Are both of these men considered fathers? If so, how could that affect the status of the child (eg Cohen, Levi, Yisrael). Could the male gene donor be the 'father' and the male cell donor be the 'mother'[32], with the female gestational carrier a second potential mother?

- What if technology develops a way to harvest genetic material from multiple gene donors and splice it together to form a fetus? If halachic parenthood is determined by genetic input, could each one of those donors be a parent?
- Could a clone be considered the sibling of the donors, just like an identical twin?[33]
- Could a clone be considered an extension of the source being - 'another you'? What implications would this have for property ownership, marriage etc.

H5] MAMZERUT

- To create mamzerut is it essential for there to be a physical sexual relationship?[34] Is it enough for there to be sperm (eg AID from a relative or for a married woman from a donor other than her husband).[35]

30. The female gives both nuclear and mitochondrial DNA.
31. As mentioned above, the question of maternity with surrogate babies is hotly debated. In the early days of surrogacy most poskim took the view that the birth mother was the halachic mother. Some poskim are now leaning in favor of the genetic mother. In the case of cloning there may of course be TWO genetic mothers, as in this case. See my shiur on Surrogacyathttp://www.rabbimanning.com/index.php/audio-shiurim/cji/medical-ethical/
32. See the discussion above concerning the Minchat Chinuch's case of a male genetic provider being potentially classified in halacha as a 'mother'.
33. See Jewish Medical Ethics: Cloning People and Jewish Law, Rabbi Michael Broyde, Journal of Halacha and Contemporary Society Vol XXXIV (1997) p.27. Rabbi Broyde discusses this and many other implications of cloning in his article. He concludes that it is very unlikely that a clone will be a sibling (as with an identical twin) since siblings, by definition, must share a parent and the clonor and clonee do not share a 'parent' - neither egg/cell donor, gene donor nor gestational carrier. Sibling connections are not usually defined by genetics. For instance, if identical twins married identical twins their children would be genetically equivalent to siblings, but would halachically be cousins. Similarly, if two identical twins both cloned themselves it seems unlikely that the clones would also be considered to be identical twins (even though they are both genetically identical).
34. Note that mamzerut and status issues may not be a result of a prohibited act. For example, if two mentally incapable (shoteh) siblings produced a baby, they would not have committed any aveira (as they are both exempted from mitzvot) but the baby would still be a mamzer.
35. On the issue of AID, there was a major debate between the poskim. Although R. Moshe Feinstein permitted it, other such as the Satmar Rov and the Tzitz Eliezer ruled that it was adultery.

• In the case of cloning there is NEITHER a physical relationship NOR sperm. Is contribution of a genetic nucleus sufficient to create mamzerut?
• Some poskim, such as the Chelkat Ya'akov (on the issue of AID) argued against the heter of Rav Moshe Feinstein. He held that, although it may not be incest, there is a fundamental chilul Hashem in the crossing of certain boundaries. As he writes: "from the point of view of our religion these ugly and disgusting things should not be done, for they are similar to the deeds of the land of Canaan and its abominations".
• Could cloning be used to CURE mamzerut?

19. ממזר הבא על העכו"ם הולד עכו"ם. ואם נתגייר הרי הוא כישראל. ואם בא על השפחה הולד עבד. נשתחרר הרי הוא בן חורין. לפיכך ממזר נושא לכתחלה שפחה שקבלה עליה מצות וטבלה לשם עבדות להתיר בניו שישתחררו ויהיו מותרים בישראלית

שולחן ערוך אבן העזר סימן ד סעיף כ

The halacha provides a mechanism to 'cure' mamzerut. If a male mamzer married a shifcha cana'anit - a non-Jewish slave who had accepted mitzvot, the child would be an eved cana'ani - a non-Jewish slave who had accepted mitzvot. If that child was then freed by its master it would be a regular Jew without mamzerut.

• Could a mamzer donate a nucleus and produce children who were not mamzerim?

I] CONCLUSIONS

• It is not clear that there are any halachic grounds to prohibit cloning. Some poskim would fully equate halacha and ethics and thus permit it on that basis.
• However, many poskim regard the meta-halachic and hashkafic considerations to be highly relevant.
• No halachic authority is unreservedly in favor of all cloning. However many writers have argued for a permissive and positive approach, including - Rabbi Michael Broyde, Dr Fred Rosner, Rabbi Avraham Steinberg, Rabbi Moshe Tendler.[36]
• Others have taken a more conservative or outright prohibitive approach, including - Rabbi Immanuel Jackobovitz, Rabbi Dr. Abraham Abraham, Rabbi Yisrael Meir Lau.
• Since most of the cloning research is currently dedicated to stem cell medical development, the halachic issues have so far been less controversial.

36. For further analysis of the many of these issues, see the articles in the Torah U'Madda Journal, Volume 9.