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"A Feminist approach to Ectogenesis: why we should consider it a tool to achieve Gender Equality."

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Academic Year: 2017-2018

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Introduction

This bachelor's thesis, argued in the scope of bioethics, seeks to understand and analyze why the process of ectogenesis, or artificial wombs, can be considered a tool to achieve gender equality. It will be explored, following diverse feminists theories, including philosophical and ethical approaches, such as libertarianism, utilitarianism and principles of ethics of care.

The subject of ectogenesis, which is the full gestation of a human fetus in an artificially created uterus, is regarded as one of the most controversial bioethical topics, given its innovative nature and highly experimental methodologies. Its particularity makes it an incredible favorable means in order to further clear the path towards equality of gender, and to disrupt the given social structures in which discrimination towards women, based on gender, is the common form. Still, it is fundamental to explain that ectogenesis would also create encouraging new equal opportunities for members of the LGBTQI community, but at the same time it would serve as an alternative in the abortion debate, making it an appealing practice for the conservative pro-life activists. Opposing ideas, however, are present and have a substantial impact on how the general public perceives this process. While on one hand it is seen as a liberating experience from the shackles of socially (and non) imposed burdens for women, man-made uteruses have also the potential to further constrict the already highly regulated female body, limiting even more the already scarce reproductive freedoms.

The thesis will be divided into three main chapters. In the first, I will define the concept of ectogenesis under a medical perspective, and then I will explain in practice what is to happen to the human body with the use of this technology, describing first the practical health concerns pregnancies bring upon women's bodies. In this sense, it becomes clear how the artificial womb technology (AWT) can be useful in improving these physical stresses.

In the second chapter, I will focus on the individual effects this practice can have firstly on the fetus and then secondly on the mother. In the first subdivision, I will show the differences between the nurturing and the legal consequences ectogenesis may have, when implemented, on the single fetus. In the second subdivision, I will delve deep in the meaning of being a woman and a mother, by reflecting on the existence of a supposed maternal bond. Then, I will explain why women are discriminated on the basis of their biology, especially financially, and I will analyze how different feminists theories view the concept of ectogenesis and the concerns of its implementation surrounding women. These outlooks will help describe why, for some, motherhood is seen as an empowering experience, characteristic of a woman's essence; and for others, the same capability is viewed as a means of judgement.

In the third chapter, I will analyze how the effects of ectogenesis will impact society as a whole, meaning how it should be implemented and if and which restrictions should be applied. But I will also explain the fears many people reserve for humankind once such a technology is explored and widespread. In fact, many opponents to this practice believe that the creation of ectogenetic babies will undermine our communities altogether, by distancing human beings from the intimacies of their familial relationships. Furthermore, it is believed that after such implementation, the process of eugenics may receive an easier pass in entering human society, drastically changing our concepts of creation.

In the conclusion, I will explain why I believe that ectogenesis can effectively become an important aspect for the achievement of gender equality and the elimination of discrimination based on sex. I show this to be true only after an accurate cost-benefit analysis of the process, followed by a safe and controlled implementation under a specific regulatory framework.

Chapter 1

1.1 What is Ectogenesis?

The exact definition of the term comes from the union of the Ancient Greek word "ecto", meaning outer, and genesis, explaining precisely the growth of a being outside the uterus. Throughout the literature in bioethics, very few articles and essays have been published on the subject of ectogenesis, which have reduced the scope of discussions and analysis of a matter that is highly likely to become part of our near future. In fact, "artificial womb seems the next logical step in a process that has increasingly removed reproduction from traditional maternity and made of it a laboratory process" and it will change "forever our concept of human life."[1] However you want to call it, artificial wombs, extracorporeal gestation or ectogenesis, the conversation on this topic has already been opened in several countries, and though it may sound something straight out of a sci-fi horror movie, this process may have extraordinary consequences for reaching pinnacles in equality and for human kind as a whole.

Contrary to what one may think, ectogenesis is not a novel idea. In the sixteenth century, Paracelsus provided a formula with which to create a "homunculus", whom was considered an artificial man with no soul, in a womb outside of a woman's body.[2] While the way in which this idea was to be applied, which consisted of an eighty day incubation of a man's semen, nourished by human blood, is completely fictional, this notion still remained.

The term "Ectogenesis" was actually coined back in 1923, by the British scientist J.B.S. Haldane in his essay titled "Daedalus, or Science and the Future". In this piece, Haldane makes a list of what he believed to be the "six most important biological discoveries ever made".[3] The list includes four discoveries, which he described to have been made before the start of history itself: the training of animals, the domestication of plants, the training

[1] H.P.P. (Hennie) Lotter, *Justice for an Unjust Society*
[2] https://medhumdosis.com/2015/03/23/early-ectogenesis-artificial-wombs-in-1920s-literature
[3] https://medhumdosis.com/2015/03/23/early-ectogenesis-artificial-wombs-in-1920s-literature

of fungi for the production of alcohol, and "the altered path of sexual selection" (which is the shift of women's bodies to objects of men's attraction). The remaining two biological discoveries cited by Haldane did not yet exist: bactericide, and the artificial control of conception. The author then continues by citing a fictional essay, written by a supposedly undergraduate student of the year 2073, in which he describes the birth of the first ectogenetic child, that Haldane had actually pictured happening in 1951. The student then states that ectogenesis is "now universal"; and even though he laments the demise of the "former instinctive cycle" of reproduction due to ectogenesis, he states positively that "it is generally admitted that the effects of selection have more than counterbalanced these evils."[4]

Haldane's essay was written at a time when debates over contraception and eugenics were extremely fervent on both sides of the Atlantic; consequently, his prediction was an understandable extension of these new efforts to control fertility. "Had it not been for ectogenesis," Haldane foretold, "there can be little doubt that civilization would have collapsed within a measurable time owing to the greater fertility of the less desirable members of the population in almost all countries."[5]

But what is this technology exactly? Ectogenesis is the process of creating an environment that will simulate that of a womb in which a human fetus can develop.[6] In Webster's dictionary it is described as the "development of a mammalian embryo in an artificial environment "; a sort of bio-bag, with a flux of oxygen, filled with specific nutrients, needed to recreate the environment present in a uterus, and a form of waste disposal. What's more surprising is that research, achieving concrete and major results, is already happening, while most people are in the dark about it.

In April of 2017, researchers at the Children's Hospital of Philadelphia announced that they were developing an artificial womb, needed to improve the survival rates of premature

[4] https://medhumdosis.com/2015/03/23/early-ectogenesis-artificial-wombs-in-1920s-literature
[5] https://www.thenewatlantis.com/publications/why-not-artificial-wombs
[6] http://www.voicesinbioethics.net/newswire/2016/03/21/ectogenesis

babies. Their results show that lambs (at the equivalent of a premature human fetus of 22-24 weeks) are able to successfully grow in the biobag, with the oldest lamb now more than one year old. [7] Actually, back in 1982, researchers conducted a study in which they reported the ability to incubate a mouse fetus for eleven days out of the twenty-day gestational period, specific for a mouse.[8] Moreover, four months after the birth of the infamous cloned sheep Dolly, Yoshinori Kuwabara's study, at Juntendo University, had become the most significant in this field. Goat fetuses, removed from their mothers' womb before viability, were gestated through an extracorporeal membrane oxygenation unit (ECMO). His artificial womb basically consisted of a plastic box, filled with amniotic fluid into which the goat fetuses were placed. Though, it is important to underline the fact that Kuwabara's intention was not to create an artificial uterus that kept embryos alive from the moment they were implanted until their birth.

Even though research recently has been quite stagnant, human testing for ectogenesis has already started, as scientists have successfully grown a human embryo in an artificial environment for eleven days in 2011. At Cornell University, Hung-Ching Liu is currently developing a specialized technology able to keep an embryo alive for longer periods before they are put into a natural uterus. Her study consists of a fertilized ovum that was implanted into the cells, and that ovum lived for six days, at which time Liu halted the experiment. Liu states that she hopes to "create complete artificial wombs using these techniques in a few years."[9]

Unlike other argued biotechnologies, such as cloning, the creation of a safe and normalized ectogenetic process involves a much broader and wider community of people who would actually be supporting ectogenesis. Limitations of natural, biological pregnancies would be eradicated, and those who are perpetually kept out of this ordinary procedure, such as gay men, trans women and infertile persons, would be able to appease their longing for children

[7] https://www.theguardian.com/lifeandstyle/2017/sep/04/artifical-womb-women-ectogenesis-baby-fertility
[8] http://www.voicesinbioethics.net/newswire/2016/03/21/ectogenesis
[9] Scott Gelfand, *"Ectogenesis: artificial womb technology and the future of human reproduction"* Vol.184. 2006.

of their own. Since our cultural understanding and definition of family grows ever so inclusively, it doesn't seem as though this practice can be kept at bay for too long.

1.2 What it means for the human body.

Analyzing it through a medical view, ectogenesis offers an alternative to surrogate motherhood for women who are unable of being naturally pregnant or for whom pregnancy is not recommended on medical grounds. The latter would be those who have undergone medical practices such as hysterectomies or women whose health would be worsened by being pregnant. However, these women would still be able to provide their eggs, which would then be fertilized in vitro with the designated sperm, and the embryo would continue to develop in an elaborate artificial womb, until it was ready to be born- presumably first into a humidicrib and only later into the normal environment.[10]

In this instance, the medical case for ectogenesis would consist of the medical case for surrogacy with ectogenesis being the preferred method over the latter. If early experiences with surrogacy showed an inability of the surrogate mothers to give up the children they gestated to their genetic parents, ectogenesis might become the better option if opposed to a custody battle. Proof that surrogate mothers frequently smoked or took alcohol or drugs that caused harm to the baby might be another reason for preferring the strictly controlled artificial environment.[11]

Many scholars have argued for the implementation of ectogenesis, as we can see for example in Peter Singer's and Deane Wells' "The Reproduction Revolution: New Ways of Making Babies", in which they argue that this practice offers an alternative to surrogate motherhood in the treatment of infertility. According to both authors, ectogenesis likewise could receive support from an improbable place, specifically, anti-abortionists and pro-life movements supporters. Singer and Wells argue that the right to an abortion is a right to be free of an unwanted pregnancy, not a right to the death of one's fetus. This means that it

[10] Scott Gelfand, *"Ectogenesis: artificial womb technology and the future of human reproduction"*Vol.184. 2006.
[11] Scott Gelfand, *"Ectogenesis: artificial womb technology and the future of human reproduction"*Vol.184.2006.

could be a win-win situation for both sides. As peculiar as it might seem, Ectogenesis conceivably could win the support of right-to-life organizations and others opposed to abortion. If anti-abortionists and such believe that an embryo is a human being right from the moment of conception, then surely they would promote technologies that would extend the period in which a natural womb is not required to keep the being safe and growing. They should support its extension to all cases of spontaneous— that is, not deliberately induced—abortion, no matter how soon after conception the spontaneous abortion should occur.[12]

At the same time, ectogenesis could push pro-life supporters towards an acceptance of abortion, mainly because their opposition is simply rooted in the fact that abortion equates to "murder". If abortions meant simply the removal of the fetus from the mother's body and the continuation of its life outside the womb, then surely this practice would be met positively. "If we could keep a fetus alive outside the body, abortions could be done using techniques that would not harm the fetuses, and the fetuses, or newborn babies as they would then be, could be adopted—if there were enough willing couples. Abortions would in effect become early births, and the destruction of the unborn would cease." [13]

It seems as though pro-choice allies would not be opposed to this practice, since their stance would remain on the freedom of what to do with one's own body. However, an issue could emerge from this ectogenesis debate. It is argued that the woman should still have the right to decide whether her own embryo lives or dies; in fact, she may not want to keep it but she may not want to give it up to adoption at the same time. There are very limited ,if none, circumstances in which the death of a healthy fetus would be accepted, if the woman's wish to be freed of the fetus can be fully satisfied without threatening the life of the being itself. Though, this way of thinking is entirely different than the argument for abortion, and it would not be widely condoned.

[12] Scott Gelfand, *"Ectogenesis: artificial womb technology and the future of human reproduction"*Vol.184.2006.
[13] Scott Gelfand, *"Ectogenesis: artificial womb technology and the future of human reproduction"*Vol.184.2006.

After analyzing the main reasons why the process of ectogenesis could be publicly accepted, we can delve into probably the most controversial aspect of the whole debate. Can ectogenesis actually and concretely become an instrument towards the achievement of gender equality? It is argued that feminists should blatantly welcome this new technology because it would undoubtedly eliminate the threat of women being denied freedom to choose whatever they want to do with their body. But reality is not quite this simple.

One of the main thesis sustains that since, through ectogenesis, birth and child bearing are no longer the natural destiny of women, obsessive and damaging mother/child relationships would no longer be the norm.[14] As particular as this thought may seem, it finds its origins in Shulamith Firestone's "Dialectic of Sex", one of the pivotal works of the modern feminist movement. In her book, she claims that the ultimate cause of inequality between the sexes is simply the natural reproductive difference between males and females.[15] in which the *second wave* feminist echoes Marx's dialectical materialism. Just as it happens for society as a whole, the author states that within a typical heterosexual family there is a highly marked division of labor, in which one sex, clearly the female one, "bears the burden of reproduction" for both. Firestone reasons that "one half of the species sacrifices itself to perpetuate the entire humanity, while the other half goes about the business of the world".[16] In her vision, women are oppressed because they bear children, accordingly, their roles as mothers are forced upon themselves; "the overworked phrase "women and children" is suggestive of a relationship of codependence and mutually reinforcing oppression" as Firestone says, which is why she believes that women won't be truly emancipated and free until they are "released from the biological shackles of pregnancy and childbirth", and "children won't develop into autonomous and happy individuals as long as they're considered the property of their parents"[17].

[14] https://onlinelibrary.wiley.com/doi/pdf/10.1111/j.1467-8519.1987.tb00006.x*Ectogenesis: A reply to Singer and Wells*
[15] Scott Gelfand, *"Ectogenesis: artificial womb technology and the future of human reproduction"* Vol.184.2006.
[16] https://partiallyexaminedlife.com/2016/10/18/on-childhood-motherhood-and-being-ahead-of-your-time-shulamith-firestone-and-the-dialectic-of-sex/
[17] https://partiallyexaminedlife.com/2016/10/18/on-childhood-motherhood-and-being-ahead-of-your-time-shulamith-firestone-and-the-dialectic-of-sex/

Firestone has the boldness to offer a biological reason for female inequality. Her solution is ectogenesis:

"I submit, then, that the first demand for any alternative system must be: 1) The freeing of women from the tyranny of their reproductive biology by every means available, and the diffusion of the childbearing and childrearing role to the society as a whole, men as well as women."[18]

This clearly does not mean the creation of better day-care centers with male workers. What the author proposes is a concrete biological revolution that would put women on the same biological level as men, in respect to procreation. Firestone also tell us why these changes are rarely talked about and discussed: science is in male hands. Exactly as to why, in the view of many feminists, the creation of a male oral contraceptive has been reduced, if not eliminated, by male reluctance to share the risks and responsibilities of contraception, at the same time according to Firestone's view research into developing new methods of reproduction has been impeded by hesitancy to accept new possibilities that could radically change the traditional male-dominated family structure.[19] Furthermore, she notes how any advance in the technology of ectogenesis has been made towards the betterment of help and care of premature children, and not for the sake of creating options for women. According to Kimberley F. Curtis, "the most central condition for women *qua* women is the biological capacity for gestation and childbirth."[20] However, Susan Cooper, a psychologist that deals with couples going through infertility treatments, has argued that, while yes, pregnancy may be important for most women, it is hard to understand if this deep yearning is part of a biological impulse or cultural desire.

This theory becomes apparent in Evie Kendal's work "*Equal Opportunity and the Case for State Sponsored Ectogenesis"* in which the author explores different arguments in favor of this procedure from a feminist perspective. It is well known and understood that pregnancy and childbirth are recognized to pose numerous health risks, with some 'normal' pregnancy-related symptoms, such as dizziness, drowsiness, heartburn, nausea and so on,

[18] Scott Gelfand, *"Ectogenesis: artificial womb technology and the future of human reproduction"* Vol.184.2006.
[19] Scott Gelfand, *"Ectogenesis: artificial womb technology and the future of human reproduction"*Vol.184.2006.
[20] Kimberley F. Curtis, 'Hannah Arendt, Feminist theorizing, and the Debate over New Reproductive Technologies,' *Polity* 28, no. 2 (1995): 162.

not leaving behind the trauma that is caused precisely by the act of childbirth in itself. However, since these symptoms are considered normal, they then fail to be acknowledged seriously and many are left untreated, causing at least 15% of women worldwide to develop potentially life threatening illnesses. In ' The Moral Imperative for Ectogenesis,' University of Oslo professor Anna Smajdor, argues that these issues alone mean "the claim of women to be relieved from this means of reproduction can be firmly located within a recognizably health-oriented need."[21] She further emphasizes the injustice that it is women alone who must face the physical risks associated with pregnancy and childbirth, while society at large benefits from their 'sacrifice.'[22] Let us not forget that even though death during childbirth is not as common, it still is present in great numbers. This is why Frida Simonstein and Michal Mashiach-Eizenberg stress how it is remarkable that despite the fact that pregnancy 'can be deadly,' it is still not classified as an illness, suggesting this is because "reproductive hazards have traditionally been viewed as women's fate and, therefore, taken for granted."[23]

Kendal continues her argument, showing us how pregnancy and childbirth, in the best case scenarios, continue to carry that idea of certainty of some level of physical illness or sickness and that "natural pregnancy and childbirth have both 'debilitating' and 'disfiguring' effects on women, many of which are expected and unavoidable."[24] Normally one would typically tend to avoid such circumstances in which significant discomfort and prolonged pain is guaranteed but in case of pregnancies this type of is distress is treated very differently. In fact, it would be absurd if a patient suffering from appendicitis had asked for a natural, pain relief free medicine, but what is not viewed as strange and irrational is a woman feeling guilt for requesting analgesia during labor. According to one report in *The Daily Mail* one in four women recall not receiving adequate pain relief during delivery, leading to unnecessary physical and emotional suffering.[25]

[21] Smajdor, 'The Moral Imperative for Ectogenesis,' 340.
[22] Equal Opportunity and the Case for State Sponsored Ectogenesis -Evie Kendal.2015.
[23]Frida Simonstein and Michal Mashiach-Eizenberg, ' The Artificial Womb: A Pilot Study Considering People's Views on the Artificial Womb and Ectogenesis in Israel,' *Cambridge Quarterly of Healthcare Ethics* 18 (2009): 88.
[24] Equal Opportunity and the Case for State Sponsored Ectogenesis -Evie Kendal.2015.
[25] Equal Opportunity and the Case for State Sponsored Ectogenesis -Evie Kendal.2015.

It seems as though women lose a degree of bodily integrity while pregnant, as another human life now occupies the space inside her own body. This means that the health of the being growing inside her is more important than hers, restricting her freedom and liberty to certain activities but more importantly to medical treatments. A pregnant woman's compromised immune system makes her particularly susceptible to certain illnesses, including many that cannot be treated effectively without risking harm to the fetus.[26] Let's suppose, for example, that a woman gest cancer while pregnant, causing her to face the dilemma of undergoing chemotherapy, to cure herself, or not using any medical cares that would harm the fetus. In this case, Kendal argues, ectogenesis could be a concrete lifeline. Women could simply choose instead to transfer their fetus to an artificial womb before commencing treatment. These arguments come in favor of ectogenesis in cases in which it would allow an easier access to the fetus if surgical intervention were required, for example, to correct a neural tube defect.

Clearly, ectogenesis could in fact not only remove the pain of childbirth and the possibility of birth injury to both the mother and fetus, as no birth event takes place, but it could also eliminate any type of physical damage sustained during a natural pregnancy. Most importantly it would reduce the probability of maternal death and trade it with zero mortality risks. Regardless of how individual women may feel towards the physical burdens that childbearing brings, natural pregnancies ,in any case, lead to physical changes in every woman, for whom many of these transformations can have disastrous consequences. As Shulamith Firestone declared in her *'The dialectic of Sex'*: "Pregnancy is barbaric. ... Pregnancy is the temporary deformation of the body of the individual for the sake of the species. Moreover, childbirth *hurts*. And it isn't good for you."[27]

Preconceptions surrounding motherhood have been, for the most part, eroded and dismissed thanks to scientific and social improvements. Motherhood without biological links in the case of adoption is highly praised and motherhood with biological links but

[26] Equal Opportunity and the Case for State Sponsored Ectogenesis -Evie Kendal.2015.
[27] Shulamith Firestone, The *Dialectic of Sex: The Case for Feminist Revolution* (New York: William Morrow and Company, 1970), 198.

without pregnancy in the case of surrogacy is largely accepted. Also, due to divorces and artificial inseminations, single motherhood is increasing and not frowned upon anymore. In this setting, artificial wombs could be viewed as simply a continuation and expansion of the new idea of the family. It enshrines technologically a current cultural reality: the erosion of the belief that mothers and fathers are unique and thus different, not interchangeable.[28]

However, many ethicists, including feminists, are reluctant to accept this aspect of the ectogenesis debate. Being that this is a highly controversial and divisive subject, Rosemarie Tong, professor at the University of North Carolina and leader in feminist bioethics, sustains that it can lead to a commodification of the entire process of pregnancy. "To the extent that we externalize an experience like pregnancy, it may lead to a view of the growing child as a 'thing.'" The core of this argument is the basis of what human pregnancy is. It seems that if we shatter the illusion of the "miracle of life", we may feel more prone to intervene in modifying every aspect of it, to suit our own desires, leaving little to no element to fate. What would be at stake is the very root of what it means to be "born" and not " made ", which is ,of course, debatable since this is evidently such an archaic belief. In fact, we could argue that, even when it happens in the most natural way, we are essentially being made, most of the times, voluntarily by our parents.

Nevertheless, challengers and opponents of ectogenesis sustain that we would have catastrophic consequences on the already inadequately viewed and protected female body. While researchers may reason that an artificial womb is a safer and "cleaner" space to gestate a child, given the fact that it wouldn't be threatened by the introduction of any type of alcohol or illegal substances, Tong claims that relatively few people would be allured by ectogenesis. After all, who decides which gestational environment is better? If women nowadays can't decide for their own bodies, what would happen if their bodies are not needed anymore? Some feminist ethicists claim that instead of emancipating women, this procedure may bring the polar opposite situation, threatening women's social status.

[28] https://www.thenewatlantis.com/publications/why-not-artificial-wombs

Australian sociologist Robyn Rowland has argued that the creation of artificial wombs would consequently mean the complete termination of women's innate power. She states that women may find themselves lost, without a "product of any kind with which to bargain". She, in some ways, reduces her view of women to simple child creators by saying: "We have to ask, if that last power is taken and controlled by men, what role is envisaged for women in the new world? Will women become obsolete?"[29]

This is what is envisioned, for example, in Ann Oakley's book[30], "The Captured Womb: A History of the Medical Care of Pregnant Women" in which we are shown how ectogenesis would be part of the age-old habit in which male and misogynistic medical systems have taken control of birth and women's wombs in the name of science. In this sense, preexisting biases and inequities would radically be exaggerated. This is also the nightmarish scenario present in Margaret Atwood's "The Handmaid's Tale", in which men in a dystopian infertile United States, now under the government of Christian extremists, known as Gilead, subjugate women by stripping them of their rights and separating them into three distinct classes. The handmaid, being of the lowest class but also technically the most important, has the role of bearing children for the wives of the most important men of the nation. While we may never reach this specific class distinction, the popularity of this book, also adapted into a tv series, is certainly given by the terrifying yet not too improbable future.

Critics of ectogenesis push for the understanding of the ethical implications that ectogenesis would bring. Many argue that in present times there seems to be an inability to stop intervening in the creation and use of reproductive technologies. "If reproduction is at once completely separated from sexual love," Haldane wrote, "mankind will be free in an altogether new sense." But many traditional scholars believe that this freedom is already being exaggerated. In just the last few years, technology has been used to create mixed-sex embryos and towards the harvesting of the undeveloped ovaries of aborted fetuses, opening the doors to producing children with aborted fetuses as biological mothers. In this setting, many argue ectogenesis seems more like a culmination of present trends than a radical

[29] https://www.thenewatlantis.com/publications/why-not-artificial-wombs
[30] https://www.huffingtonpost.com/soraya-chemaly/ectogenesis-feminism_b_4385417.html

departure[31], underlining the worry this creation may bring to those who believe it would only be an instrument to keep embryos alive as a source of tissues and organs that could be of great benefit to more mature humans. Though, this would be considered as a partial ectogenesis in which the embryo is not brought to term. Its survival is not the aim of the procedure: the survival of others is.[32]Ultimately, those who consider in vitro fertilization to be *unnatural*, will certainly be utterly repulsed by artificial wombs, considering it to be more unnatural, given the fact that anything to which human intelligence is applied to better or modify its biological state, is already not in its natural manner.

Artificial limbs and organs are largely accepted, but something about a man created uterus just doesn't seem to work out as the same. Even the term "artificial womb" seems to be an oxymoron, putting together the terms artificial, reminding us of a chemical harsh manipulation, and womb, a nurturing, homely environment. Is it because the goal we seek to obtain from it is not merely an object, but a real human being? Or does it hide a deeper explanation, rooted in the patriarchal society we've all grown so accustomed to? Whether or not it is considered an abomination or the next great human revolution, ectogenesis is near and surely approaching our world. What should be considered now is how the individual, being the fetus, the woman or even the man, is going to be influenced by it and the consequences this may have on society as a whole. Haldane argued that science held possibilities if "mankind can adjust its morality to its powers", but at the same time while a society full of situational moralists would undoubtedly be less troubled with ethical dilemmas, would it be "human the same way" ?[33]

[31] https://www.thenewatlantis.com/publications/why-not-artificial-wombs
[32] Scott Gelfand, *"Ectogenesis: artificial womb technology and the future of human reproduction"*Vol.184.2006.
[33] https://www.thenewatlantis.com/publications/why-not-artificial-wombs

Chapter 2

2.1 What it means for the individual: the fetus.

The human womb has been a subject of awe and mystery since the dawn of times. This is only the basic reaction to both its biological aspect and its powerful significance as a symbol of fertility, reproduction and as an emblem that will ensure the continuation of our species. What is fascinating and compelling is that it is not considered as a "normal" organ although it can be donated and transplanted; plus, it being more mysterious than an organ that is both shared between men and women, makes it absolutely unique. It is the starting point for the creation of human life.

In an essay written just before he died, the philosopher Hans Jonas observed that "natality," as he called it, "is as essential an attribute of the human condition as is mortality. It denotes the fact that we all have been born, which means that each of us had a beginning when others already had long been there, and it ensures that there will always be such that see the world for the first time, see things with new eyes, wonder where others are dulled by habit, start out from where they had arrived."[34]So how will ectogenesis impact this quasi-magical element of human existence?

If we group the arguments for and against ectogenesis, with the subject being the fetus, we can identify two different areas of interest: the nurturing aspect and the legal feature. In Singer and Wells' five pro-ectogenesis arguments, the strongest argument in favor of it, regarding the existence of the fetus, is without a doubt its hypothetical goal to resolve the abortion controversy. As we know, in present times there is no way to remove a first trimester or early second trimester fetus without killing it, but if its put into an artificial womb, it would continue to grow. However, the main issue that arises while thinking of an ectogenetic child is precisely the nurturing aspect. How will a child that is growing in an inhuman, unmotherly machine react to it? How is his growth and psychological

[34] https://www.thenewatlantis.com/publications/why-not-artificial-wombs

development going to be affected? Is it going to grow normally? Most importantly will the presence of some element, whether chemical or emotional, that is transmitted from the mother to her child during pregnancy that we are unable to detect, influence differently a natural gestated child?

Unfortunately, given the fact that we still lack a complete understanding of what are the perfect conditions for a well-adjusted child, any type of trial will be classified as human experimentation, encountering the horrified backlash of those against it. Furthermore, it could be an especially thoughtless testing since it might take years before a complete evaluation can be performed. We would not know if the children of ectogenesis were normal in their emotional and mental development; meanwhile, several thousand ectogenetic children might have been brought into existence, all destined for a disadvantaged human life. [35] Following this line of thought, Vera Brittain wholly rejected ectogenesis. She claimed that whether or not natural gestation is essential for mothers, it is somehow essential for children.[36]In fact Brittain said that:

"[The] first laboratory-grown children … suffered as much psychologically from lack of individual parental affection or they gained physiologically through being selected from the best stock. The majority of them, indeed, though most carefully exercised, dieted and exposed to sunlight, dwindled away and died about the fifth year." [37]

Surely, if extracorporeal gestation becomes practical, critics will claim that mother and child are harmed because of the non-existence of bonding. But what exactly is this bonding? It is the alleged biological connection developed between female gestator and fetus during nine months of pregnancy.[38] After the Baby M case in 1985, in which gestator Mary Beth Whitehead claimed that during gestation, birth, and during breast-feeding, she had bonded with Baby M, a lot of women philosophers sided passionately on either side of the bonding dispute. The claim that Whitehead had grown attached to the baby, sparked an intense

[35] Scott Gelfand, *"Ectogenesis: artificial womb technology and the future of human reproduction"*Vol.184.2006.
[36] Scott Gelfand, *"Ectogenesis: artificial womb technology and the future of human reproduction"* Vol.184.2006.
[37] Brittain, *Halycyon, or the Future of Monogamy*, p. 77.
[38] Scott Gelfand, *"Ectogenesis: artificial womb technology and the future of human reproduction"* Vol.184.2006.

debate as if it is really possible to create a powerful psychological and metaphysical connection with a baby who is being developed.

New York City psychology professor, Phyllis Chesler claimed that "children bond with their mothers in utero" and "suffer terribly in all kinds of ways when this bond is prematurely or abruptly terminated." Declaring a concrete opposition towards any kind of artificial gestation, Chesler was soon confronted by philosopher Hillary Baber who argued that very little evidence exists to support this claim. Amazingly enough, she debated this while being pregnant herself whereas Chesler had never borne a child. Baber also noted that some traditional mothers may have emphasized to have a mystical bonding to the child "in order to maximize the social evaluation of their contribution". Therefore, we can predict that such women will see extra-corporeal gestation as a threat to their own roles, lives, and values. [39] Another important fact to underline is that historical evidence also seems to be against the alleged force of bonding. Aristocratic women used wet nurses after birth to breastfeed their newborns. So, if bonding were real how could babies be given away to be breastfed so easily? Wouldn't the aristocrats much prefer to bond with their children, rather than having them bond with a nursemaid?

Following this argument, once again Singer and Wells offer an equivalent response, claiming that biological pregnancy could potentially not be in children's best interests because it causes mothers to cling to their children as their lifetime special possessions. [40] In fact, Shulamith Firestone saw the special mother–child relationship as an aspect of female inequality and therefore something to be done away with if at all possible.

There is no concrete evidence whether this maternal bond exists as a biological element, or simply as a sentiment that has been reinforced through generations. What ought to be understood is that the presence or not of this element cannot give room to harshness and

[39] Scott Gelfand, *"Ectogenesis: artificial womb technology and the future of human reproduction"*Vol.184.2006.
[40] Singer and Wells, *Making Babies*, p. 120

judgements towards those who may or may not experience it. Surely, it cannot be the basis as to why ectogenesis should or should not be accepted.

The second issue that arises when we consider fetuses as subjects is the legal aspect. It is important to underline that there are two main sets of artificial womb use: the first consists in the implantation of an embryo directly into the created uterus for the entire period of gestation; while the second is the transferal of an embryo or fetus from a woman's womb to the ectogenetic machine. These two types of artificial womb use could each have different effects on how maternal, paternal, and state interests in a fetus or embryo are balanced. [41] Since in the first scenario an embryo is never *in utero*, could either parent later on have the right to perform any type of euthanasia? Put more simply, would they be able to "pull the plug" without being stopped? In the second scenario, the woman is pregnant and she wishes to terminate her pregnancy either because she wants to abort the fetus or because she is unable to continue the gestation for medical reasons. In this case, could the woman later on be prohibited by the state to abort if ectogenesis is available? If she is choosing to transfer the baby to the artificial womb, could she later have it unplugged?

In the first setting, neither the genetic father nor the genetic mother has a greater legal authority based on their bodily integrity, compared to a normal pregnancy in which the mother's right is recognized as overriding the father's, since she is the one physically pregnant. Even though in the Davis v. Davis case it was recognized that women undergo more pain and a greater bodily invasion in order to donate eggs, the court held that "none of the concerns about a woman's bodily integrity that have previously precluded men from controlling abortion decisions is applicable here."[42] A court might give a different status to an embryo that is frozen and then implanted in an artificial womb than the one it gives to an embryo in a woman's womb. In fact, an analysis of the enforceability of frozen embryo contracts, says that if an embryo is conceived ex vivo and implanted in a womb, neither

[41] Development of Ectogenesis: How Will Artificial Wombs Affect the Legal Status of a Fetus or Embryo-Jessica H. Schultz
[42] Development of Ectogenesis: How Will Artificial Wombs Affect the Legal Status of a Fetus or Embryo-Jessica H. Schultz

party should unilaterally have the right to unplug the ectogenetic machine.[43] Since it is said that an embryo that is implanted is different than an embryo that is frozen, states might have a bigger interest in a life that is already forming rather than a static one. Consequently, neither parent would have the right to terminate the pregnancy in an artificial womb.

In the second setting, we have to differentiate case A from case B. In case A, we have a woman who is pregnant and wants to abort the embryo or fetus, making it an *in utero* scenario. This is important because in most countries currently there is no paternal right to make decisions concerning an embryo post-conception unless it is outside of a woman's womb. Potential fathers cannot get injunctions to stop potential mothers from having an abortion, nor can they demand that the potential mother get an abortion. [44] Moreover, the United States Supreme Court has ruled unconstitutional that a woman should require a written consent from her husband to be able to terminate her pregnancy. The potential mother controls the decision, and although some argue that the father's interests in the life of the fetus could in some cases outweigh the potential mother's interest in aborting their unborn children,[45] courts have enormously stated that only the potential mother has the legal authority to terminate her pregnancy.

In the case of ectogenesis, an artificial womb could allow a woman to end a pregnancy while allowing the father, a third party, or the state to protect the potential life of the fetus, bringing an unexpected compromise between pro-choice and pro-life sustainers. But would the mother still be able to terminate the growth? Since the state can restrict abortions after viability, which is the newborn's ability to live outside the mother's womb, not including the ability to live without mechanical assistance, in the case of an ectogenetic pregnancy this threshold would need to be revisited. Thus, the argument is that once artificial wombs become a real option, the state could always restrict a woman's right to an abortion because

[43] Development of Ectogenesis: How Will Artificial Wombs Affect the Legal Status of a Fetus or Embryo-Jessica H. Schultz
[44] Doe v. Doe, 314 N.E. 2d 128, 130 (Mass. 1974) (denying an estranged husband an injunction to prevent his pregnant wife from procuring an abortion).
[45] Development of Ectogenesis: How Will Artificial Wombs Affect the Legal Status of a Fetus or Embryo-Jessica H. Schultz

the fetus would always be "viable, meaning that, if removed, it could fully gestate within an artificial womb. [46]

This would not meet the pro-choice advocates' goals, as they believe abortion rights to be based on the idea of not wanting to become a mother rather than terminating a pregnancy. A woman who wants to abort, desires not only to separate herself physically from the fetus but wants also to eliminate the burden of knowing that her child exists somewhere and is being raised by people she does not know. Supporting this argument, ethicist Leslie Cannold found that pro-choice women posed with a scenario of an unplanned pregnancy found ectogenesis an unappealing option.[47] Inevitably, the implementation of this technology will modify the debate on abortion from whether or not a woman has to right to end her pregnancy, to whether or not she has the right to terminate the life of an embryo or a fetus.

In case B, the woman does not want to abort the embryo or fetus but the fetus is removed and placed into an artificial womb. In this scenario, the mother is obligated to transfer her embryo to an artificial uterus in order to better treat her health or the fetus' health. Could she then have the right to decide to terminate her pregnancy? Could the father?

Once again, these questions are argued on the basis of the current definition of viability and if a fetus inside an artificial womb has the same rights as one in a natural one. Just as we said before, it is likely that neither the father nor the mother would have the authority to terminate a pregnancy after a fetal transplant, depending on the state of viability, making it of the same legal status as a naturally gestated fetus.

[46] Development of Ectogenesis: How Will Artificial Wombs Affect the Legal Status of a Fetus or Embryo-Jessica H. Schultz

[47] The sample was forty-five women from Canada and was done in 1992.

2.2 What it means for the individual: the mother.

What makes a woman? What does it mean to be one?
Many times, throughout centuries, these questions have been raised, and they have been met mostly by the same answers: women are mothers, they are nature's caregivers. Motherhood henceforth symbolizes all that is comforting, harmless and personal.
For as long as man existed, being a woman meant creating life and taking care of it, sacrificing yourself for the welfare of the newly created being. Women were considered nurturing, safe, and somewhat fragile enough to be mistakenly deemed as the weaker sex. Based off of the sedimented belief that women were inferior both physically and mentally, practices regarding pregnancy and maternity have always been in the hands of male physicians and doctors, further restricting the opportunities women had to any type of freedom. For this reason, changes in gestation practices may seem especially dangerous to those conventional notions of family and female nurturing.[48]

Starting from this point view and because we have been trained by many terrifying end-of-the-world-as-we-know-it science fiction stories, it becomes clear identifying the reasons why such gestational advances are mostly met by shock and "yuck"[49] factors. This is what Gregory Pence describes as *Evolved Implies Ought Fallacy* in which since humans used X to date, X is seen as morally acceptable. The error in this line of thinking is evident, it goes without saying that many of the practices that were considered fundamental for evolution are now seen as horrendous and ethically wrong.

Most writings about assisted reproduction show this practice as an attack on traditional family norms, following the centuries-old anti-intellectual tradition in Western culture to always demolish any innovation regarding sex and motherhood that could destroy and subvert the status quo. Let us take anesthesia during birth as an example. First discovered

[48] Scott Gelfand, *"Ectogenesis: artificial womb technology and the future of human reproduction"*Vol.184.2006.
[49] Scott Gelfand, *"Ectogenesis: artificial womb technology and the future of human reproduction"*Vol.184.2006.
The yuck factor, initially coined by bioethicists Arthur Caplan, explains how our instinctive disgusted response to something, idea or practice should be seen as evidence for the intrinsically harmful, unethical character of that thing.

by Georgia primary care physician Crawford Long, and later re-discovered by a Boston dentist, this practice changed the birthing process for millions of women. Still anesthesia during childbirth was condemned by religious personalities because of the existence of the verse, where God says to Eve (after her sin of tempting Adam in the Garden of Eden), "I will greatly multiply thy sorrow and thy conception; in sorrow thou shalt bring forth children; and thy desire shall be to thy husband, and he shall rule over thee." (Genesis 3:16)[50] .

This idea of women being "forced" by nature to suffer in order to have children has secured over time the role of mothers during pregnancies, making illnesses, and, in extreme cases death, natural consequences of their biology. As previously stated there are many physical worries associated with pregnancies but what is extremely important in this discussion is to highlight also the economic and social burdens brought on as well. In Evie Kendal's essay, the most prominent issue is the influence of "potentially coercive pronatalist agendas", that promote the idea of completely abandoning one's own life goals in order to suffice fully the socially accepted notion of motherhood. Dorothy E. Roberts claims that such social pressures are often first used on women to *encourage* pregnancy, and then applied as a justification to "socially police the behavior of women *while* pregnant."[51]

Pronatalism is defined by Eileen Fischer as "the belief that people should have children, regardless of the means required to become parents"; while her research is focused predominantly on industrialized societies, the claim is that all cultures "valorize parenthood". Moreover, in a pronatalist belief system being without child signifies an important social disadvantage, making it mandatory for women to bear children in order to obtain a concrete level of social status. This argument is further developed by Diana Meyers who states that in a pronatalist society women are coerced to believe that motherhood is an "inevitable part of life", explaining why many women pursue pregnancies without fully considering alternatives. Meyers continues by blaming this type of society, for the displays of "maniacal dedication to infertility treatments", when women are experiencing difficulties in conceiving. Pronatalists systems are also to blame for portraying this

[50] Scott Gelfand, *"Ectogenesis: artificial womb technology and the future of human reproduction"*Vol.184.2006.
[51] Equal Opportunity and the Case for State Sponsored Ectogenesis -Evie Kendal.2015.

romanticized view of motherhood being directly linked to womanhood, and Ann Oakley notes that despite the liberating effects of the contraceptive revolution, the pressures of social expectation mean "few women feel they really can avoid becoming mothers."[52] More importantly, although pronatalist social coercion also influences men's reproductive abilities, it impacts women's life disproportionately making us praise motherhood and pity those who are infertile, convincing us to regard women who simply don't want children as immature or abnormal.

A perfect example of this is given by asking the question 'do you have any children' to both men and women. When asking a man, if the answer is positive, the father figure is congratulated, being viewed as an extraordinary person, who is doing something that is not required from him; if the answer is negative, then simply no one bothers to ask for an explanation, as it is somewhat already given. At the same time, childless couples are often made to feel socially inferior to parents, despite the fact that they are likely to enjoy higher levels of education, greater occupational satisfaction and better couple communication and interaction than their childrearing counterparts.[53] In fact, Kendal argues that the social strain given by pregnancy is twofold: first, society expects women to become pregnant and then pregnancy is the reason why their opportunities and social lives are limited.

Another important aspect is the ultimate loss of personal privacy many pregnant women seem to have experienced. The baffling contradiction of medical ethics is evident when ,at the same time, it is being founded on doctor-patient confidentiality and the utmost respect for a person's personal information, and it reduces continuously this aspect when what is at stake is a pregnant woman's health, whose body quite literally declares one's own reproductive status in a way that a man's body simply does not. Sander-Staudt also reflects on the fact that "the visible signs of pregnancy often give others a feeling of entitlement to offer unsolicited advice or to touch a woman's body," compromising very publicly her right

[52]Ann Oakley, 'Gender and Generation: The Life and Times of Adam and Eve,' in *Women and the Life Cycle: Transitions and Turning-Points*, eds Patricia Allatt, Teresa Keil, Alan Bryman and Bill Bytheway (Essex: Macmillan Press, 1987), 27.
[53] Satoshi Kanazawa, 'Intelligence and Childlessness,' *Social Science Research* 48 (2014): 157; Harold Feldman, 'A Comparison of Intentional Parents and Intentionally Childless Couples,' *Journal of Marriage and Family* 43, no. 3 (1982): 598.

to privacy; while men are able to conceal their reproductive endeavors, and can procreate without putting at stake their medical and personal space. In this sense, ectogenesis might be the only concrete solution of completely protecting a woman's right to secrecy and as a stepping stone towards gender equality. This technique has the possibility to defy the very foundation of pronatalism by promoting a future in which procreation and human development is not solely based on manipulating women to get pregnant.

From a gender equality standpoint, it is fundamental to emphasize that in a pronatalist society both men and women enjoy the benefits that a child entails but only the woman is the direct subject of both the physical and social threats this child brings. Ectogenesis has to be considered a gender issue because both men and women will be able to gain and lose differently, and at the same time so will individual women compared to other women.
As Debarun Majumdar states, in a pronatalist society "males have less to lose and more to gain socially than females in the event of a birth."[54] This being also due to the fact that having children means having different employment opportunities for men and women.

There are many economic burdens that women have to face if they want to generate life. Initially, there might be the need of temporary withdrawal from paid employment in order to give birth and the possibility of prolonged absences from work for childcaring instances. Linda R. Hirshman defines this as problematic, explaining that it heavily impacts a woman's financial independence and security, by overburdening her future earning capacities, as it is perceived by employers as loss of human capital. Hirshman argues that "domestic life provides fewer opportunities for 'full human flourishing' than exist in the public domain, even though devoting time to raising children has obvious emotional and immediate rewards."[55]

Although most of the financial concerns are connected with the care of children rather than pregnancy itself, physical incapacitation can be seen as the foundation for gender

[54] Debarun Majumdar, 'Choosing Childlessness: Intentions of Voluntary Childlessness in the United States,' Michigan Sociological Review 18 (2004): 111.
[55] Linda R. Hirshman, Get to Work: A Manifesto for Women of the World (New York: Viking, 2006), 54.

inequality in childcaring responsibilities. Women have to "slow down" due to their pregnancy, making it increasingly more complicated to evade domesticity after childbirth. This becomes especially evident when their return to paid employment would necessitate full-time childcare, whose expenses are often calculated as exclusively coming out of the woman's salary.[56] Hirshman reports that when returning to work would cost a significant portion of the woman's salary for childcare, it is assumed that she should stay home to save money, despite the fact that there is no sufficient motive behind deducting the money just from her income, instead of the household one. Among other career obstacles women have to face while trying to re-enter the workplace, we have to note likewise the hostility from co-workers and supervisors when returning part time, and the ever present scarcity of affordable childcare facilities.

In the discussion on the unequal number of men and women in positions of authority, Oakley notes that it is "childbearing for women that is more likely to bring downward occupational mobility than anything else."[57]She says that all other things being equal, a male and female of same experience and qualifications may begin on an identical career path with equal future outlooks, but time spent away from paid employment due to family obligations "will soon leave the woman lagging behind, both in terms of pay and position." In *Pregnant Men*, Ruth Colker argues that the plain capability to become pregnant "has historically been an excuse for denying women equal employment opportunity," regardless of whether or not an individual woman actually wants to become pregnant.[58] Women have historically been discriminated on the basis of biological difference, being intentionally denied access to specific jobs and positions in order to avoid the trouble of having to arrange and pay maternity leave, in case this could become a concrete possibility. The persistence of the 'wage gap,' in which women are paid less to do the same jobs as men, causes further difficulties in deciding which parent will stay home to be the caregiver for

[56] Equal Opportunity and the Case for State Sponsored Ectogenesis -Evie Kendal.2015.
[57] Oakley, 'Gender and Generation,' 29.
[58] Ruth Colker, Pregnant Men: Practice, Theory, and the Law (Bloomington: Indiana University Press, 1994), 159.

the children, compounding once again financial disadvantage for women as a result of sex-based discrimination.[59]

In this aspect, ectogenesis represents the only way in which procreation would not impose additional employment restrictions on women compared to men, as both would continue to work at the same time throughout the entire gestation period, without having regards to the type of employment involved. Consequently, it would make it harder for women to fall directly into the "staying at home" trap, being that they would no longer be burdened by the physical limitations of natural pregnancies, especially after a subsequent reduction of the wage gap. Ectogenesis offers women positive freedoms in the form of "freedom-to" births that would not otherwise be possible.[60] If artificial wombs were affordable to everyone, they would offer a reproductive alternative to women and others whose circumstances would normally preclude a natural birth. For example, post-menopausal women, or women at high risk for complications in pregnancy, avoiding potentially messy human and legal relations that arise from the use of a surrogate mother; but also transwomen and women or men in same-sex relationships.

While most liberal feminists seem to agree with this positive implementation of ectogenesis, some have warned us about the possibility of disastrous consequences upon women's freedom that result from this 21st century technology. History has never been a kind teacher: from forced sterilization to chastity belts, it is bursting with examples of reproductive technology working to control rather than to liberate women.[61] Wanting to regulate wanted and unwanted pregnancies, these instruments worked against women hindering their own sexual and reproductive agencies. It might seem a bit of a stretch to imagine women being forcefully obligated to reproduce via ectogenesis, nevertheless it could become a possibility alongside with the chance of a forceful removal of a fetus from the mother's womb, in order to protect its own rights. Knowing that ectogenesis will very

[59] Equal Opportunity and the Case for State Sponsored Ectogenesis -Evie Kendal.2015.
[60] OF MACHINE BORN? A FEMINIST ASSESSMENT OF ECTOGENESIS AND ARTIFICIAL WOMBS Maureen Sander-Staudt. 112.
[61] OF MACHINE BORN? A FEMINIST ASSESSMENT OF ECTOGENESIS AND ARTIFICIAL WOMBS Maureen Sander-Staudt. 113-114.

likely be a technology that serves the interests of more powerful members of society, who predominantly continue to be men, this will continue to retain some of the current lack of social opportunity for women. Unfortunately, there is no guarantee that simply freeing women from their biological connection to pregnancy and birth will ensure that all women can equally participate in education, business, and politics.[62] Furthermore, obstetrical health care benefits, that are already scarce for many women, could become nonexistent , if medical resources are concentrated towards ectogenic research, or if a woman decides to continue her risky pregnancy, contrary to her doctors' advice. However, the solution to these issues seems simple; many liberal feminists believe in concrete, fair legislation and the use of representational democracy to control the environments and circumstances under which ectogenesis is developed and used, as well as to who is allowed to access it and why.

If we look at another branch of feminism, we will see the same dichotomic debate. On one side, radical feminists who see women's nature as intrinsically incapacitating, will celebrate artificial wombs as a technological escape from the natural burdens and disadvantages of pregnancy. The goal for them is to change biology, to bring men and women on the same procreational level. But some radical feminists, i.e. ecofeminists and cultural feminists, see women's biology as something to be cherished, that could become potentially empowering. Cultural feminists fear that ectogenesis might bring a devaluation of the unique maternal relationship, by supporting the destruction, commodification, and control of all that is natural. From this feminist perspective the goal is not to change women's biology ,but to revalue women-centered pregnancy and birth.[63] Once women's physical state is reappraised, they state, it becomes clear that this "biological disadvantage" is largely socially produced.

Another perspective is offered by the ethicists of care. It consists of a perception associated with the work of Carol Gilligan and others who underscore the relevance of sex to moral

[62] OF MACHINE BORN? A FEMINIST ASSESSMENT OF ECTOGENESIS AND ARTIFICIAL WOMBS Maureen Sander-Staudt.115-116.
[63] OF MACHINE BORN? A FEMINIST ASSESSMENT OF ECTOGENESIS AND ARTIFICIAL WOMBS Maureen Sander-Staudt.115-116.

reasoning.[64] They believe that the physical aspects of women's reproductive capacity can produce a relational ethical perspective. In the ethics of care, relationships are the starting point and the main ontological ideals, which explains why the mother-child relationship is essential in this sphere. Going against the liberal and radical view of freedom from the shackles of pregnancy, and obsessive connection between womanhood and motherhood, the most important contribution that an ethics of care can make to the debate on ectogenesis is to speak of the importance of measuring this technology in terms of relationship and dependency and not just independence and autonomy.

For instance, Sara Ruddick, notes that although men and women can both become "mothering-persons," mothering must be understood from a female perspective of connection to a child.[65] If this is the case, going ahead with artificial womb technology would not work towards this particular goal, since scientists wouldn't be able to replicate the physical interdynamics between a mother and her child during pregnancy. Additionally, without more information, ectogenetic babies would not be able to receive immunities from their mothers during gestation, and perhaps not even after birth either since breast milk is only stimulated in some women by the actual experience of pregnancy.

One apparent objection to this line of argument is that, in this sense, ectogenesis would be no different than fatherhood or adoption. Most fathers, as well as women who adopt do not directly experience the gestational relationship, yet are able to bond readily with their children.[66] This analogy, however, does not take into the account the presumed importance of the gestational relationship between the child and someone, not necessarily the child's own parent, which in turn would be beneficial in bonding for both the baby and the parents. We cannot ignore the fact that a natural pregnancy can create and nurture a relationship between the child and the *someone* that goes further beyond the simple physical aspects of gestation; if this is the case then would the use man created uteruses increase a biological,

[64] Carol Gilligan, In a Different Voice: Psychological Theory and Women's Development (Cambridge, Mass.: Harvard University Press, 1982).
[65] Sara Ruddick, Maternal Thinking (Boston: Beacon Press, 1989), p. 15.
[66] OF MACHINE BORN? A FEMINIST ASSESSMENT OF ECTOGENESIS AND ARTIFICIAL WOMBS Maureen Sander-Staudt.116.

physical and emotional distance between mother and child, subsequently having an impact on society as a whole?

Chapter 3

3.1 Should it be part of a public healthcare system?

In a not too distant future in which ectogenesis could become a plausible reality, human kind would have to quickly face the next big revolution that would undoubtedly change the course of history. Given the magnitude of this event, after having analyzed the main consequences this practice may have on the single individual, we should look beyond the given thresholds and examine what this would mean for our solidly established society.

As the process of ectogenesis becomes more direct and accessible, state governments and pharmaceutical corporations would engage in a tug of war of who should gain the monopoly of this new endeavor. According to Evie Kendal, the premise of this technique makes ectogenesis a strictly public service[67], since it has the potential of relieving and solving significant medical and social burdens for women all over. Kendal supports her argument by first stating that, concurring with Gwen Gray, we can find several reasons as to why states should publicly provide health care aids, by finding benefits on why health should become a "quasi-public" good.[68] Mainly, Gray argues that universal healthcare profits all members of a community, irrespective of who actually contributes to it monetarily. Health is a basic human right, that ,when instated, can overall enhance labor productivity, thus creating a chain effect on resources.

Unfortunately, the trend of public education funding to train doctors who then go into private practice, or the fact that many wealthier people use public services for major surgeries, has created a domino effect on less advantaged people of society who won't benefit from either the public or private sector. This would then become a major issue in the positioning of ectogenesis, since women, within these underprivileged groups, represent an even weaker circle; including the element of geographical isolation, which compels an even greater resource rationing. The disparity of easy and concrete access to

[67] Equal Opportunity and the Case for State Sponsored Ectogenesis -Evie Kendal.2015.
[68] Gray, 'Access to Medical Care under Strain,' 909.

public healthcare is even more prominent in the availability of ARTs(assisted reproductive technology), since infertility is not a life threatening condition. It does however impact the quality of life, making it a perfectly public health matter.

One of the main ethical issues regarding state sponsored ectogenesis, common with surrogacy, would be the fear of the creation of an underclass of women, who are either forced to gestate or hired out, in the case of surrogacy, by wealthier people. According to Murphy, in the case of ectogenesis, the social elite would have an easy access by paying for these technologies, while poorer communities could only still rely on women's bodies for gestation.[69] She gives an example of a court appeal in which a researcher asked for permission to gestate a fetus in a woman's dead body, since "women are the cheapest incubators we have", emphasizing the fact that artificial incubators are still seen today as expensive, compared to natural gestation, and this would only worsen once ectogenesis enters in force.

Still Kendal argues the importance that ectogenesis should not be restricted to only those who can afford it. Analyzing it from a feminist point of view, the effects this segregation could have, would further distance women from men, by distancing women who can afford it from women who simply cannot. Just as we have seen by how IVF admission and adoption are ridden by protocols that when permitted restrict access with a classist and even racist agenda, favorably accommodating the needs of affluent, white, heterosexual couples, while disregarding the desires of homosexual individuals, single women, minorities and people of low socio-economic status.[70]

If we look at ectogenesis as a medical technology intended to alleviate and remove childbirth and pregnancy associated illnesses, it becomes apparent how if a user-pay system is installed, this would continue to disadvantage the same women who are underprivileged today. If wealthier women were to only ones able to access this technology,

[69] Murphy, 'Is Pregnancy Necessary?' 69.
[70] Equal Opportunity and the Case for State Sponsored Ectogenesis -Evie Kendal.2015.

then they would become even more competitive in areas in which they already have the upper hand, such as employment. [71] Though, this is strikingly in direct conflict with the principles of equal opportunity and the principle of universality on which any type of universal health care is founded. According to Uwe Reinhardt, Nozick's libertarian vision for this type of free to all access healthcare system is not shared by 'the world at large,' since 'literally no country seems prepared to surrender the delivery of personal health services and products to arbitration by unfettered market forces.'[72] Still if ectogenesis became a luxury product, it would not alleviate any type of gender disparity or inequality, being then used only by the fortunate members of society.

Setting ectogenesis up as a publicly available service would not eliminate the possibility that the private market can cultivate at the same time this technology, just as we have seen for other ARTs. In this sense, the disparity between the social strata wouldn't be reinforced, since it wouldn't be a rich-only resource; it would simply allow those who have the possibility, to achieve it quicker. The important factor is the creation and the sustaining of a strong public system, that ,from the start, allows private industry to develop in a way that would not damage poorer citizens, by also reducing the strain on any public healthcare systems, such as Medicare.[73]

If ectogenesis becomes an openly public and shared matter, the issues would then arise surrounding the sphere of who regulates its access, and especially how and according to which principles the access should or shouldn't be restricted. Following Norman Daniels' line of thought, we can argue that "health should be placed in a special category of goods", and that "the state has a responsibility to subsidize healthcare to protect each citizen's access to the normal opportunity range for someone at their stage of life".[74] Yet, he states, that there should be a clear maximum to what the state funds in terms of healthcare, by restricting its scope to what is considered as upholding, endorsing and fixing 'normal species functioning'. Consequently, access to ARTs would be legally restricted only to

[71] Robert Nozick, Anarchy, State, and Utopia (New York: Basic Books, 1974), 233.
[72] Equal Opportunity and the Case for State Sponsored Ectogenesis -Evie Kendal.2015.
[73] Equal Opportunity and the Case for State Sponsored Ectogenesis -Evie Kendal.2015.
[74] Norman Daniels, Just Health: Meeting Health Needs Fairly (Cambridge: Cambridge University Press, 2008), 175.

infertile women who are of an appropriate physiological age, creating a less ethically troubled approach compared to allowing an open market to determine entry.

However, it is evident how this method would completely disregard the objective of ectogenesis to create equality between genders by giving equal opportunity of access, and Evie Kendal once again shows us how there are no reasons to have such restrictions on this technology. As we have aforementioned, not only infertile women would benefit from ectogenesis, since it has also the capacity to aid those who are in same sex relationships, but it would certainly eliminate the risk of severe difficulties, but also the existence of pregnancy related worries and the physical trauma of childbirth.[75] Moreover, there are concrete grounds according to which restricting access based on age would go against both a feminist and an equal opportunity perspective.

If the goal of ectogenesis is to create a more equal state between men and women, by allowing them the same type of involvement in the creation of life, then age restrictions would alienate women more, by continuing to allow men to father children also in advanced age, as they do today, without any sort of limitation. Additionally, many studies show that women now prefer a postponement of reproduction, in order to better focus on career opportunities and commitments. Knowing that "even at the relatively young age of thirty, up to ninety percent of a woman's eggs are gone", [76] Brigitte Leeners showed us how fertility steadily declines with age for women, with a reduction of 6 per cent from 25 to 29 years-old, 14 per cent from 30 to 34 years-old and 31 per cent from 35 to 39 years-old, with number largely increasing after that threshold. [77] In this mindset, women feel then obligated to get pregnant at a very early stage in their employment, limiting their career-developing opportunities and further disparaging them from their men co-workers. Therefore, a system that permits postponed childbearing would positively promote gender equality, but also equality between women since the age at which a woman finds and

[75] Equal Opportunity and the Case for State Sponsored Ectogenesis -Evie Kendal.2015.
[76] Hayes, 'Female Infertility in the Workplace,' 1301.
[77] Brigitte Leeners, et al., ' The Relevance of Age in Female Human Reproduction – Current Situation in Switzerland and Pathophysiological Background from a Comparative Perspective,' General and Comparative Endocrinology 188 (2013): 169.

decides upon a suitable partner can vary from person to person and there would be no rush as to who gains everything first; thus it would not force them to give up on certain aspects of life. Under these circumstances, in order to reduce illnesses and developmental malformities that could arise in advanced maternal age, ectogenesis could become a useful tool in delaying the desire of many to create a family for when there is financial stability, by harvesting ova at a young age when quantity and quality are at their peak.

3.2 Who should be able to access it?

Based on what we have discussed before, after attesting that ectogenesis should become a public practice, the question regarding the need to establish standards and guides, still remains. When discussing matters of resource allocations, utilitarian principles are the first to come to mind in order to determine which of the public patients should be prioritized to receive medical treatments. Since classical utilitarianism aims at maximizing the overall happiness and benefits of society, in this case this would mean aiming at the maximization of the overall health of the given community. This principle is at the basis of many healthcare services allocations, "the greatest good for the greatest number". [78] According to Oommen C. Kurian, utilitarianism is defined by dealing with the issue of scarce resource allocation with the intrinsic "capacity to put forth a hypothetically objective base for deciding problems of moral significance", such as giving priorities to those who should receive state funded medical services.[79] This is achieved through the use of specific measurements, such as cost-utility analysis (CUA), which is explained as the ratio between the cost, measured in monetary units, of a health-related intervention and the benefits it produces, in terms of years lived, and quality-life adjusted years (QALY), which is the product of life expectancy, calculated in years, and its quality over that time, estimated in utilities.

[78] Jennifer Ruger, Health and Social Justice (Oxford: Oxford University Press, 2010), 19; 23.
[79] Oommen C. Kurian, 'rationalizing Rationing: e Curious Case of Economic Evaluation in Health,' Social Scientist 36, no. 7/8 (2008): 41.

Allowing everyone in the public healthcare system to receive equal access and equal resources, though respecting Bentham's famous motto, "each to count for one, and none for more than one", would leave the social disparities untouched, ameliorating the wealthy while further damaging the poor. Thus, promoting equal ectogenetic opportunity would mean prioritizing those who have scarce resources, given the fact that individuals from these poor communities tend to also experience poorer health results. Of course, those for whom artificial gestation would be the only mean existent to procreate, may have a higher right in public funds, establishing, in this way, a system founded on the severity of the medical case, even though the physical burdens associated with pregnancy and childbirth mean that all women should be justified in requiring access according to their medical necessity. [80] This means that clearly the utilitarian principle cannot be the sole basis for the distribution of any type of ARTs, especially ectogenesis. In fact, strict utilitarianism can serve also as a means of discrimination against certain subgroups, since their needs are not seen as necessities. If we were to solely rely on the maximization principle, we would then have to exclude certain individuals from receiving state funded treatment in order to promote overall utility, by further distancing minorities. This is what Ruger calls "the aggregation problem for utilitarianism", in which the needs of minorities are sacrificed in order to benefit the majority.[81] It is evident that if we base the allocation of ectogenesis under these circumstances, the basic utilitarian method will need to be revisited

3.3 Societal restrictions on Ectogenesis.

Apart from the strictly financial and economic burdens, still, it seems as though the most serious impediment to this medical advance, would be found in society's attitude towards women. In Simonstein and Mashiach-Eizenberg's survey, when questions were asked regarding the need to create an artificial womb in order to save premature babies and fetuses, the responses were content and positive towards the implementation of this technology. When questions were posed, however, regarding the need to alleviate women's burdens from pregnancies, the answers that were received were harsh and opposing. "When

[80] Equal Opportunity and the Case for State Sponsored Ectogenesis -Evie Kendal.2015.
[81] Ruger, Health and Social Justice, 21.

the idea of easing women's "natural" roles in reproduction was at the center of statements, the [artificial womb] became unacceptable."[82] This is evident also in the presence of different "activist groups" such as Men's Rights Activists (MRAs), that see the artificial womb as a sort of consequence of the recent discussions surrounding the diminishing roles of men and importance of masculinity in our society, especially after the publication of "The End of Men," Hannah Rosin's widely-read column in The Atlantic and her 2012 book of the same name, in which the author shows us what it would mean to live in a world dominated entirely by women. MRAs have long resented women for a number of reasons but more importantly for receiving paid maternity leave, for being favored in child custody disputes , and strikingly also for insisting that women's bodies remain at the center of reproductive politics.[83] For these individuals, ectogenesis is seen as the holy grail of solutions, the one element that will destroy these inequalities, by removing the supposed "social power" that women seem to have by default of childbirth. At the same time, on the opposite side of the men first organizations, conservative individuals still seem to denounce the creation of artificial wombs on moral and religious instances.

This also plays out in how ectogenesis and such techniques are seen in the media, which influence the public ideas even more in a never ending cycle. An example of this can be seen in the 1997 science fiction movie *Gattaca,* starring Uma Thurman and Ethan Hawke. Though in this tale ectogenesis is not present, the concept of eugenics is explored, which is a present common fear people believe may happen if ectogenesis became the norm. The story revolves around a world in which libertarian eugenics is allowed and heavily practiced, and though genetic discrimination against those born "normally" is illegal, in practice genotype profiling is used in order to put the "best people" at the top. While eugenics is not a direct consequence or prerequisite for ectogenesis, one of the main worries regarding this practice is the plausible creation of classes of individuals born through ectogenesis that may either become highly praised, constituting an elite, or completely ostracized, being relegated to the lowest levels of society, and/or being the subjects of various types of human experimentations, reminiscing of some of the most famous horrific stories.

[82] Simonstein and Mashiach-Eizenberg, ' The Artificial Womb,' 93.
[83] https://www.thedailybeast.com/the-artificial-womb-will-change-feminism-forever

These concerns bring us inside the ever present debate on the different liability issues regarding the implementation of the artificial womb. As Singer and Wells stated: "If it is unethical to attempt ectogenesis in humans until we have a reasonable assurance that it is safe, and we can have no reasonable assurance that it is safe until it is carried out, we seem to be in a classic "catch22" situation. Work on ectogenesis will remain forever unjustifiable."[84] Moreover, how can we be sure of the risks this practice brings if there are no ways to experiment on it? One possible way to evade this "catch 22" issue is to start by using ectogenesis only for premature babies who are already on very low chances of survival, which would be greatly supported since it would be based on the premise of saving human lives. Unfortunately, this type of intel would not be sufficient; while it would help us in understanding if an 18 week old fetus can survive in an artificial uterus, it would not tell us if an 18 day old fetus would have the same chances. So, if ectogenesis became permissible in order to prevent premature child deaths, this type of research would not be enough without concrete experiments on early stages embryos. The help should then come from privately funded studies, utilizing donated IVF embryos.

3.4 What would happen to the world as we know it.

After having analyzed the serious of economic and legal issues that could concretely become an important social discussion matter, the last aspect pertaining the involvement of ectogenesis in society is the far-fetched imagery of a detached civilization in which the roles of mother are no longer present and the intimate familial relationships have to be reimagined. Firstly, it is believed that ,just like the attachment a baby has to its mother's body, an artificially incubated child could develop a similar affinity to the machine that gestated him, making his first "human" interactions be with an impersonal technological device. These far-reaching views come from a radical way of thinking that, while recognizing in maternity a potential site for oppression, emphasizes its role as an empowerment tool, being attentive as to how ectogenesis may decrease or increase this

[84] Peter Singer & Deane Wells, Making babies: the science and ethics of conception.1987.

power. More importantly, these thoughts come from an understanding of the direct link between the cultural value of motherhood and the lives of real women and children.[85]

In fact in some cultures, as we have argued before, the act of giving birth is one of the only ways in which women can achieve an important level of social status, in which, the ideas that pregnancies and being a mother mean commitment and accomplishment, are enriched with significance. While this seems to be hard to achieve in our society, radical feminists want us to appreciate this ideology. They support this theory by showing how men have long envied and tried to control women's ability to create new life, explaining this by uncovering what is considered to be a cultural fear of maternal power. This is evident when demonstrating that beneath a shallow reverence for mothers there are patriarchal social frameworks that damage and injure maternal authority.[86] An example of such process is given by naming. Surnames (or sir names) [87]are a perfect model in clarifying how children were considered property of fathers and not mothers. Similarly, in western literature mothers are often seen as manipulative, crazy, powerless and even neglectful, i.e. Euripides's Medea, that are out to damage their children, instead of the being the ones capable of saving them. This is why, from this point of view, ectogenesis is seen as a disagreeable practice: it continues this trend of patronization and humiliation of women's biology , by also trying to reduce women's power as mothers. Moreover, ecofeminists argue that ectogenesis is merely a tool to control and measure women's irrational, wild power, seen as one with nature. As Val Plumwood has stated, "to be defined as nature (as opposed to reason) is to be defined as a passive non-agent and non-subject", meaning that by implementing such technology, women's reproductive biology can be easily replaced by machines void of consciousness, subject to man-made controls and purposes; confining pregnancy as plain mechanical process. In this way, artificial womb technology becomes a part of the relentless streak of replacing nature with machineries, thus continuing the

[85] OF MACHINE BORN? A FEMINIST ASSESSMENT OF ECTOGENESIS AND ARTIFICIAL WOMBS Maureen Sander-Staudt.117.
[86] OF MACHINE BORN? A FEMINIST ASSESSMENT OF ECTOGENESIS AND ARTIFICIAL WOMBS Maureen Sander-Staudt.117-118.
[87] OF MACHINE BORN? A FEMINIST ASSESSMENT OF ECTOGENESIS AND ARTIFICIAL WOMBS Maureen Sander-Staudt.118.

destruction of the environment to further fuel man's technologies. Ecofeminists, in fact, argue that there are many ecological concerns regarding ectogenesis that we should focus on. We should for example take into account what might happen if artificial gestating machines in a medical lab get caught in a power outage, without the presence of a backup generator; or we should consider the increasingly concerning problem of over populating the world, especially when there continuously is an enormous quantity of children available for adoption.

Ectogenesis sees itself as a way to change the cultural meaning of being a mother, to reimagine the concept of being born. But in a society in which children are artificially gestated what would it mean to be born? Would it refer to when the fetus is grown to a full term infant, or perhaps to the precise moment when the baby is disconnected and removed from the machinery, or even to when she was handed over to the custody of a caregiver?[88] It is clear that in such a society we would have to redefine some essential aspects that have been shared throughout generations and have been considered usual and standard across cultures. More importantly, the creation of these new definitions should not scare us into believing that they are concrete impediments to the implementation of ectogenesis. Cultural norms have never stayed the same, and still in this very moment they are changing incessantly, allowing us to continuously better ourselves, especially in regards to how we act towards each other. While there certainly is something particular about human nature that comes from being born out of a womb and all of the mystery surrounding it, there is also something extraordinary in the ability to create innovations that make humanity even more miraculous.

[88] OF MACHINE BORN? A FEMINIST ASSESSMENT OF ECTOGENESIS AND ARTIFICIAL WOMBS Maureen Sander-Staudt.118-119.

Conclusion: can ectogenesis help us reach gender equality?

When in 1931, Aldous Huxley wrote his novel "Brave New World", in which ectogenesis firstly became a publicly discussed matter, the idea of creating human children in man-made machines seemed as far as men being able to walk on the moon. Less than a century later the doors to this technology have been opened, sparking an incessant amount of debates. Conditioning ourselves to believe that any type of god like intervention seemed absolutely barbaric and inhuman, the general response to this type of experience has been anything but kind, nonetheless I believe this ought to change. The process of ectogenesis is simply groundbreaking. Just imagining the fact that human kind as a whole has reached a point in knowledge in which there is the possibility to recreate something that not until long ago was considered a mystical taboo, is astonishing. But what I find to be even more incredible is without a doubt the revolutionary consequences this practice will have both in terms of gender equality and in improving women's overall wellbeing. Knowing that we still lack of sufficient practical information in order to fully assess the direct effects we may encounter, I trust, that if implemented correctly, artificial womb technology would be an optimal tool in achieving equality between genders, based on various reasonings.

Agreeing with Evie Kendal, ectogenesis would primarily gain importance in the elimination of pregnancy related illnesses and child birth complications, especially death which is still highly present in developed countries, affecting especially women belonging to poorer minorities. Many women accept the idea of sacrificing themselves just for the sake of continuing our species, and in a time in which this can be avoided, I find it extremely unjust to prevent ectogenesis from happening just because we want to preserve what is considered natural, in a world where more than half of the population would not be alive if we were just left with earth's "natural" assets. Moreover, ectogenesis could promote the disruption of pronatalist societies in which there has been a systematic gender based discrimination ever since women entered the workforce. It is a known fact that the absence of women from many high ranking positions is given by the obligation to take time away for childbearing purposes. Even though this should be considered as a biological occurrence, and women shouldn't be disfavored based off of something that is "natural", there seems to have been

little to no improvement in regards to helping women not be discriminated and fired from their employment opportunities. Hence, I agree that artificial womb technologies would be the ideal method in resolving this horrendous situation.

Continuing in favor of this practice, it is without a doubt that ectogenesis could support the path to gender equality, because it would equate biologically both men and women, but especially fertile and infertile women, and same sex and opposite sex couples. This would create the breakdown of any type of discrimination based on gender, and push for a much needed reevaluation of cultural beliefs about the meaning of family and traditional gender roles associated with parenthood. This, of course, happening only after the correct regulations are applied in order to not disadvantage anyone. This means that access should not be restricted to only those who can afford it, since ectogenesis would be even more successful and useful to those belonging to the poorest social strata. The state should then be interested in the pursuit of the implementation of this technology, creating safe regulatory frameworks that would not permit the creation of subclasses of either women or ectogenetic babies.

As there is no concrete attested evidence of the formation of the maternal bond, it is not given that ectogenesis would create a problem regarding attachment between mothers and babies, as is the case for adoptive parents, or fathers in general. Furthermore, a "machine born child" would not necessarily have an apathic nature once alive in our world, becoming a somewhat robotic hybrid. In fact, I consider that once ectogenesis becomes a concrete medical service, the artificial wombs would not be completely separated from the expecting parents, as there would undoubtedly be an active involvement throughout the whole process. The child then would not be alone, but would learn to hear and understand its parents' voices, just like in a natural gestation. Undeniably, from a feminist perspective, ectogenesis can be seen as the most glorious invention or as the most horrific of visions. But if the very basic premise of feminism is the search for equality between the genders, then surely, I sustain, that this practice can side with it.

The objections to this practice are real and heavily present; the risk of a further objectification of women is still existent but extraordinary consequences may arise from ectogenesis, only if there's a willingness to achieve so correctly and safely. The thorough explanation, and the right guidelines and principles, will bring this technology towards the start of a new chapter about the betterment of societal views on women, their social statuses and equality as a whole.

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Summary

Lo scopo di questa dissertazione è mostrare come la pratica dell'ectogenesi possa essere vista e utilizzata come uno strumento per eliminare la disparità di genere. In particolare, in questa tesi, tale teoria viene analizzata da un punto di vista femminista, seguendo diversi approcci filosofici e etici, riguardanti il libertarianismo, l'utilitarismo e i principi dell'etica della cura.

Possiamo ricercare la definizione esatta di questa tecnica nella composizione del termine che deriva dal greco antico. Difatti, l'unione della parola "*ecto*" che descrive l'esterno, e "genesi", non evidenzia altro che la creazione e sviluppo di un essere vivente al di fuori dell'utero materno. L'innovazione di questa esperienza si basa quindi sulla creazione di uteri artificiali, tali da rendere possibile la gestazione di un feto separatamente dal ventre della madre.

Nonostante questa pratica sia considerata estremamente nuova, la sua nascita non è poi così recente. Dopo una breve apparizione di questa tecnica nell'homunculus di Paracelso, il termine ectogenesi è apparso per la prima volta nel testo di J.B.S. Haldane, "Daedalus", nel 1923. In questa opera, Haldane elenca le sei più importanti scoperte biologiche, includendo come ultima, l'inimmaginabile e irraggiungibile controllo artificiale del concepimento e straordinariamente, meno di cent'anni dopo, l'ectogenesi si sta realizzando.

Concretamente, questi uteri artificiali non sono altro che una sorta di sacca-biologica, riempita di specifici nutrienti che servono a ricreare l'ambiente dell'utero materno, con un flusso continuo di ossigeno, e una via per smaltire gli scarti; e per quanto fantascientifico ciò possa sembrare, la sperimentazione umana è già iniziata. Infatti, dopo aver realizzato positivamente esperimenti con diversi animali, nel 2011 un gruppo di scienziati è riuscito a far crescere un embrione in un ambiente artificiale per ben undici giorni. Inoltre, la dottoressa Hung-Ching Liu della Cornell University sta attualmente sviluppando una tecnica per mantenere in vita un embrione per più tempo, affermando che spera di riuscire

a creare uteri completamente artificiali nei prossimi anni, utilizzando questa sua tecnologia.

Il carattere incredibilmente innovativo di questa pratica richiamerebbe l'interesse di una varietà di persone a favore dell'ectogenesi. A primo impatto, offrirebbe, alle donne impossibilitate di rimanere incinta, una concreta alternativa alla maternità surrogata. Su basi mediche e legali, da questo punto di vista, l'ectogenesi sembrerebbe la scelta migliore, essendo anche supportata da diversi studiosi. Peter Singer e Deane Wells, ad esempio, sostengono che questa pratica potrebbe essere sostenuta anche dagli antiabortisti, in quanto la gestazione del feto verrebbe assicurata anche al di fuori del grembo materno. Ulteriormente, l'ectogenesi potrebbe spingere gli antiabortisti a un'accettazione dell'aborto, se questo significasse semplicemente la rimozione del feto e la continuazione del suo sviluppo in un utero artificiale. Ancora, questa tecnologia concederebbe a coppie omosessuali e transgender la possibilità di avere figli biologicamente e geneticamente loro, senza dover ricorrere a tecniche particolarmente difficoltose.

Eppure l'effetto più importante e sconvolgente derivante dall'uso dell'ectogenesi si troverebbe nella possibilità di arrivare a una vera e concreta parità di genere. Questa idea si può ritrovare, in primo piano, nella "Dialettica dei sessi" di Shulamith Firestone, in cui viene affermato che la causa ultima della disuguaglianza fra i sessi è la naturale distinzione riproduttiva fra il genere maschile e quello femminile. Ricordando il materialismo dialettico di Marx, Firestone afferma che in una tipica coppia eterosessuale esiste ed è presente una marcata divisione di lavoro fra i due partner. Fondamentalmente, soltanto una metà della specie è afflitta dal "sacrificio riproduttivo", mentre la restante continua a vivere nel proprio mondo. Per l'autrice, le donne sono oppresse perché sono costrette ad essere madri, e intraprendere una relazione di codipendenza culturalmente imposta con il proprio figlio. La soluzione perfetta per Firestone, ossia il porre la donna sullo stesso piano riproduttivo dell'uomo, attraverso l'uso di tecnologie ectogenetiche, è supportata ulteriormente nel lavoro di Evie Kendal, in cui vengono proposti diversi argomenti a favore di questa tecnica specialmente dal punto di vista femminista.

Kendal afferma che l'ectogenesi è uno strumento necessario nell'assicurare che le donne non siano più vittime di malattie e deformazioni dovute alla gestazione e al parto, che non di rado portano alla morte, e che di conseguenza non sono riconosciute come vere e proprie patologie ma semplicemente come pesi da sopportare. Non appena una donna rimane incinta sembra che perda la sua integrità corporea dal momento che la salute dell'essere che sta crescendo dentro di lei diventa di fondamentale importanza. Ciò è evidente nel caso in cui la madre contragga malattie come il cancro, in cui è costretta a decidere se sacrificare se stessa, non seguendo le cure della chemioterapia, oppure a sacrificare il feto. In questo senso, l'ectogenesi risolverebbe ogni dilemma, dando ampie possibilità di scelta.

Inoltre, ci sono numerosi oneri economici che le donne sono costrette a subire se vogliono diventare madri. Inizialmente, si troverebbero davanti al bisogno di una sospensione temporanea del lavoro per poter partorire, che porterebbe a delle obbligate assenze per prendersi cura del neonato. Linda R. Hirshman indica questo come il fulcro del problema in quanto impatterebbe drasticamente l'indipendenza e la sicurezza economica della donna, rovinando le sue future possibilità di guadagno, in quanto ciò è visto dal suo datore di lavoro come perdita di capitale umano. Conseguentemente, vediamo che la quantità di donne in ruoli di autorità è bassa, nonostante abbiano le stesse qualità e abilità dei loro colleghi maschi, avendo spesso seguito lo stesso percorso di studi. Così, l'ectogenesi diventa l'unica possibile soluzione nell'evitare di imporre restrizioni addizionali sulle donne, dal momento che entrambi i genitori continuerebbero a lavorare durante tutto il periodo della gestazione, senza le barriere che una gravidanza naturale porta.

Ciò nonostante, molti etici, tra cui molte femministe, sostengono che l'uso dell'ectogenesi porterebbe gravi e irrimediabili conseguenze per la società umana. In primo luogo, il primo feto "ectogenetico" sarebbe un completo esperimento, dal momento che non abbiamo dati che provino la normale crescita e il regolare adattamento al mondo esterno per il futuro infante. Questo deriva soprattutto dall'idea di molti del mancato fenomeno del bonding, del legame fra la persona che gesta il feto e il feto stesso che si forma presumibilmente durante i nove mesi della gestazione. Questa è un'argomentazione sostenuta ad esempio da Phyllis Chesler, che afferma che i bambini "legano" con la propria madre in utero e

soffrono terribilmente quando questa catena non si forma. Tuttavia, la filosofa Hillary Baber risponde affermando che non c'è evidenza di questo legame, che sia un elemento biologico o semplicemente il sentimento che è rinforzato da generazioni.

Un altro possibile problema derivante dall'ectogenesi riguarda il feto come soggetto legale. Nel caso dell'ectogenesi, entrambi i genitori apportano lo stesso contributo alla creazione del bambino, di conseguenza si arriverebbe a una discussione riguardante quali diritti hanno entrambi i genitori. Nel caso in cui una madre volesse abortire ma il padre volesse portare a termine la gestazione attraverso l'ectogenesi, chi avrebbe maggior diritto secondo lo stato?

Nel dibattito femminista riguardante l'ectogenesi, ci troviamo davanti a una dicotomia costante. Se da un lato molte femministe liberali sostengono questa pratica, da un altro molte ci allarmano del possibile monopolio dell'ectogenesi da parte dei membri più potenti della società che continuano ad essere uomini. Allo stesso tempo, se da un lato le femministe radicali vedono nella biologia femminile l'incapacità, da un altro le stesse femministe, come le eco femministe e le femministe culturali, vedono nella stessa natura un qualcosa di potente e di formidabile. Per loro infatti, l'ectogenesi porterebbe a una distruzione e mercificazione di tutto ciò che è naturale, dal momento che questo svantaggio biologico è, secondo loro, un prodotto sociale. Un altro aspetto è sottolineato dai principi dell'etica della cura, in cui le relazioni sono il punto di partenza, evidenziando così l'importanza del rapporto madre-figlio. Per loro è essenziale, poiché affermano che le cure materne vengono soltanto dalla prospettiva femminile che ha cresciuto il feto dentro di sé. Per quanto molti possano essere d'accordo, sappiamo che questo ragionamento non è basato come ad esempio nel caso della paternità e dei genitori adottivi che alcune volte creano legami più forti rispetto a quelli materni o biologici.

Nel caso probabile in cui l'ectogenesi diventi uno strumento accessibile a tutti, i governi dei diversi stati e le industrie farmaceutiche si troverebbero in un intricato braccio di ferro per decidere chi dovrebbe avere il monopolio su questa tecnologia. Per Evie Kendal, l'ectogenesi dovrebbe essere un servizio pubblico, dal momento che aiuterebbe le donne di

ogni strato sociale. Tuttavia, uno dei problemi che potrebbe sorgere se diventa una pratica sponsorizzata dallo stato è la formazione di una sottoclasse di donne costrette a portare avanti una gravidanza o a essere "affittate" da persone più agiate. In questa situazione, soltanto le persone benestanti avrebbero accesso a questa tecnologia, lasciando le comunità più povere unicamente con la gestazione naturale come scelta. In ogni modo, Kendal afferma che se l'ectogenesi diventasse privata, questa contribuirebbe ancora di più a una segregazione sociale non solo fra donne e uomini, ma fra donne che possono permetterselo e donne che semplicemente non possono. Tuttavia, il fatto che questa tecnologia sia un affare pubblico, non toglie la possibilità dell'entrata del mercato privato come è successo già per altre tecnologie riproduttive.

Se i principi dell'utilitarismo sono i primi ad essere usati nei dilemmi di allocazione delle risorse, sappiamo che, in questo caso, ciò non porterebbe ai risultati migliori. Infatti, se utilizzassimo il famoso motto di Bentham, ossia la massima felicità per il maggior numero di persone, saremmo costretti a escludere specifici individui dal ricevere l'ectogenesi finanziata dallo stato, per promuovere l'utilità totale. Un dilemma chiamato da Ruger "il problema dell'aggregazione per l'utilitarismo", in cui le necessità delle minoranze sono sacrificate a vantaggio di quelle della maggioranza.

L'ultimo aspetto riguardante il dibattito sull'ectogenesi è l'irrazionale ma presente timore della creazione di una società in cui, non essendoci legami madre-figlio, le relazioni familiari e interpersonali siano diverse o non esistano più; infatti, se il bambino ectogenetico formasse un legame con la macchina che lo ha formato, ciò causerebbe le sue prime interazioni umane ad essere con un oggetto inanimato. Queste lungimiranti teorie provengono da un pensiero radicale che vede nella maternità una possibilità di oppressione, ma enfatizza allo stesso tempo il suo ruolo di emancipazione, mantenendo l'attenzione su come l'ectogenesi possa incrementare o diminuire questo potere.

L'ectogenesi è vista come un modo di cambiare il significato culturale di essere madre, di stravolgere il nostro concetto di nascita e di essere nato. Ma in una società in cui i bambini sono gestati artificialmente, cosa vorrebbe dire essere nato? Cosa dovremmo evidenziare?

Quando l'infante è staccato dalla macchina oppure quando è consegnato nelle cure dei genitori? È chiaro che in una società simile bisognerà ridefinire alcuni concetti chiave che sono stati condivisi da generazioni, e sono considerati comuni a tutte le culture. Cosa ancora più importante è che la creazione di queste nuove definizioni non deve spingerci a temere l'implementazione dell'ectogenesi. Le norme culturali non sono mai rimaste le stesse, e continuano a essere cambiate costantemente. Se certamente c'è qualcosa di particolare e di miracoloso della natura umana che viene dal nascere da un ventre materno, c'è sicuramente qualcosa di straordinario nella nostra abilità di creare innovazioni che rendono l'umanità ancora più prodigiosa.

Il processo dell'ectogenesi è singolare. Ciò che è ancora più incredibile è la possibilità che questa tecnologia ha nel portare sorprendenti conseguenze sia riguardanti la parità di genere che il miglioramento delle condizioni di benessere delle donne in generale. Essendo d'accordo con quanto dichiarato da Evie Kendal, sostengo che l'ectogenesi sia uno strumento fondamentale nella riduzione ed eliminazione di malattie e altri rischi, provenienti dalla gravidanza e dal parto. Inoltre ritengo completamente ingiusto impossibilitare l'avvento dell'ectogenesi per proteggere un qualcosa che è considerato naturale, sacrificando un chiaro potenziamento per le donne ovunque. Essendo più che ovvio che le donne siano svantaggiate nell'ambito lavorativo a causa della maternità, penso che l'ectogenesi potrebbe essere lo strumento perfetto per risolvere questa insopportabile situazione. In più, porterebbe a un' uguaglianza non solo fra il genere maschile e quello femminile, ma fra donne fertili e infertili, e fra coppie dello stesso sesso e coppie di sesso opposto. Infine, non essendoci nessun' evidenza concreta riguardante questo legame materno, non ritengo che l'ectogenesi creerebbe una barriera nella formazione di una relazione fra la madre e il figlio, come ciò non avviene per i padri e per i genitori adottivi.

In conclusione, ritengo che l'implementazione dell'ectogenesi possa portare a incredibili traguardi in termini di parità, soprattutto a un miglioramento dello status sociale delle donne, se è presente la volontà di realizzare ciò in maniera corretta e sicura.