

Possible Ethical and Social Implications of Artificial Uterus for
the Right to Abortion.
A perspective of Feminist Bioethics.

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Abstract

The researchers predict that within five years it will be possible to use the artificial uterus and the partial ectogenesis process on human fetuses. In light of this consideration, it is necessary to develop a feminist bioethical debate capable of analyzing the possible implications, not only ethical, but also social, to which this new technology could lead us. In particular, it is necessary to analyze what could be the implications that the artificial uterus could have on the right to voluntary termination of pregnancy.

In this thesis I will first deal with the systematic review of the stages that led to the development of the artificial uterus and then specifically analyze the relationship of the latter with the right to voluntary termination of pregnancy. In this regard, I support the thesis that, although the artificial uterus can represent an important opportunity from the point of view of medical progress, it is still necessary to place important limitations on its use in order to protect and defend the right to abortion.

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Introduction

When we talk about the artificial uterus, the idea that immediately comes to mind is that defined by the extremely utopian and futuristic narrative to which this type of technology seems to be inevitably connected. The image that emerges is that of laboratory rooms full of transparent incubators inside which the fetuses float immersed in some unidentified liquid. In this type of common ideal, the artificial uterus represents the symbol of a utopian future in which 'progress' has completed its path and reproduction, like all other areas of life, has been colonized by technological development.

Despite this, contrary to what one might think and contrary to this type of narration, the theorization of the artificial uterus is not such an 'innovative' issue and not even the obligatory result of the first technological discoveries in the reproductive field. As explained in detail in the historical-bibliographic reconstruction recently published by James Hughes¹, the first theorization of the artificial uterus dates back to the last century and is attributable to the British biologist J.B.S. Haldane. The latter, during a series of debate seminars held at the University of Cambridge, imagines being in the future and retracing all the discoveries made in the technological field in the previous decades. In doing this he theorized for the first time a world in which most babies would no longer be born from natural mothers, but through the use of artificial wombs². These encounters are then transformed into a book that is published in 1923 in which the following can be read:

As we know ectogenesis is now universal, and in this country less than 30 percent of children are now born of women. [...] The small proportion of men and women who are selected as ancestors for the next generation are so undoubtedly superior to the average that the advance in each generation in any single respect, from the increased output of first-class music to the decreased convictions for theft, is very startling. Had it not been for ectogenesis there can be little doubt

¹ Hughes, J. (2021). Artificial womb: a short history. *Orbis Idearum*, 9(2).

² Haldane, J.B.S. 1923. "Daedalus, or, Science and the Future." In *Heretics*, Cambridge, 1–23. <https://www.marxists.org/archive/haldane/works/1920s/daedalus>

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 countries³.

This passage represents an important point of view to introduce our discussion of the value and possible consequences that ectogenesis can have on the right to abortion. It is interesting to underline that although Haldane is a Marxist, he theorizes the artificial uterus making it assume an explicitly eugenic connotation. In fact, Haldane's idea is that only a small part of the population, selected on the basis of physical and psychological characteristics, is used to create new transferable embryos within artificial wombs. In this way, according to the biologist, it would be possible to choose, and therefore manipulate, the genetic traits of the next generation, thus making it 'undoubtedly superior'. Although such theories are in no way justifiable, Haldane's theory is entirely in line with the school of thought, very common at the time among biologists and genetics experts, which links Darwinism with eugenics.

This very brief digression is useful for me to introduce and underline a concept that is important to me. The artificial uterus, like other issues, must be considered a technological tool capable of assuming a positive or negative moral value based on the historical and cultural context in which it is placed. The question of the moral neutrality of new (but also old) technologies represents an extremely broad question and one that cannot be adequately explored here. However, it is important, in my opinion, to underline this question at the beginning of my argument. From here on I will support the idea that the artificial uterus, like ectogenesis more generally, does not represent an instrument which, by its very nature, threatens or undermines the right to voluntary termination of pregnancy. What I support is instead a critical view according to which the artificial uterus, inserted within a historical-social context such as the one in which we find ourselves and given some structural problems internal to our society, could have the potential to threaten or weaken the right to terminate a pregnancy. The purpose of this thesis is not to create a manifesto against the development of this new technology which, on the contrary, is of fundamental importance for medical progress in the field of neonatal care. The main purpose is instead to reconsider, in the light of the positive aspects, the value and possible repercussions

³ Ivi, p. 5.

that the artificial uterus could have as a socially and historically determined tool. Returning to Haldane, already at the time several thinkers⁴ took sides in a negative way with respect to the possible eugenic drift that the artificial uterus could have assumed. And it is during those years that the two main feminist positions on the issue begin to take shape. I emphasize again that, during the first half of the twentieth century, reproductive technologies were to be considered practically non-existent and that therefore this debate at the time assumed an exclusively academic value and whose implications were to be considered only of a political-social type. With regard to the feminist position, we see two main positions being formed. The first is outlined starting from the first theorization expressed by Haldane and partly contains the more general fears related to a possible eugenic drift. This view underlines the ethical and social danger that the artificial uterus could have had for women. In this case, the fear is that of a possible supremacist and dictatorial drift in the field of reproductive law for which only women with 'superior characteristics' would have the right to reproduce. Haldane's own wife, Charlotte Haldane, publishes a collection of short stories that specifically express these kinds of concerns. In her book the latter tells of a world now ruled only by men in which only some women would still be fertile and used for reproduction, while all the other women would be destined for forced sterilization⁵. In other words, a position emerges according to which the artificial uterus would represent an instrument of subjugation of women and the consequent elimination of their right to free reproduction. Despite the legitimate doubts raised by this position, decidedly more positive feminist positions are developing in parallel. On the other hand, instead, what is still today the position of the most radical feminists who argue that the artificial uterus would represent the ultimate tool of emancipation of women begins to take shape. According to this vision, pregnancy would represent one of the main sites in which gender discrimination is rooted. One of the main spokespersons of this type of argument is the feminist Shulamith Firestone who in 1970 published a book, 'The dialectic of sex' in which she explicitly argues that

⁴ Haldane, Charlotte. 1926. *Man's World*. London: Chatto and Windu.

⁵ Haldane, Charlotte. 1926. *Man's World*. London: Chatto and Windu.

biological reproduction subdues women as in a tyranny⁶.

The role of the woman is to fulfill the role of reproduction, which is why social reforms represent only a small benefit for women who are waiting to be freed from pregnancy.

As mentioned, however, up to now the ectogenesis and the artificial uterus represent only a hypothetical perspective useful to underline and highlight structural problems and social theories. Similarly, parallel to the first academic theorizations, the artificial uterus and reproductive technologies begin to become a topic of interest in the literary and cinematographic fields. According to Hughes, it was Haldane's text that inspired Aldous Huxley's famous book 'Brave New World'. In this case, Huxley imagines a society based on totally extrauterine reproduction in which human embryos are produced and developed in special factories according to quotas set by the world coordinators and then divided into castes based on future physical and intellectual development⁷.

All these examples are useful to show how the development of new technologies, even when not yet usable on a practical level, has always generated extensive ethical and social debates. Since its first theorization the artificial uterus has been a tool capable of exposing some problems present within society. As previously stated, its moral characterization, however, cannot be defined at an absolute level and regardless of the historical and cultural context in which it is inserted. For this reason, in light of the fact that today ectogenesis no longer belongs solely to the speculative world of science fiction, but increasingly represents a concrete reality, it is necessary to fuel the debate about the role and possible consequences that this reproductive technology could bring in a realistic way within the company.

Chapter 1

1 Ectogenesis: science fiction or reality?

⁶ Firestone, S. (2015). *The dialectic of sex: The case for feminist revolution*. Verso Books.

⁷ Di Simone, V. (2014). Il dibattito attorno all'ectogenesi: un'analisi quantitativa e qualitativa degli auspici e timori della comunità scientifica. *Revista de Direito Econômico e Socioambiental*, 5(1), 19-52.

Before getting to the heart of our discussion, it is necessary to take a step back to analyze some preliminary considerations. The purpose of this first part of the chapter is to create the basis for my discussion, underlining and reconstructing the current situation regarding the development - both practical and ethical - of the artificial uterus and ectogestation. As I will show in more detail below, although the idea of an artificial uterus dates back almost a century, its theorizing and specificity still remains nebulous to this day. It is therefore necessary to retrace the fundamental steps that led first to the theorization of this new technological tool and then to its creation. The aim is to have a clear vision in order to be able to define from a critical point of view what the potential and limits of this new tool may be, referring specifically to the possible ethical and moral implications that could affect the right to voluntary interruption of pregnancy.

1.1 Detail of the current situation regarding reproductive technologies.

Starting from Haldane and the first theorization of the artificial uterus up to the present day, much has been done from the point of view of progress in the medical and scientific fields. It is interesting to see how in the book of the British biologist 1951 was indicated as the year in which the first ectogenetic child would be 'produced'⁸. Realistically, however, we had to wait many more years before the Chinese biologist Min Chueh Chang obtains the first indubitable proof of in vitro fertilization in 1959,⁹ obtaining for the first time rabbits born alive from this type of fertilization. This result represents a milestone in the development of reproductive technologies, demonstrating how it was possible to 'move' conception outside the womb without affecting the development and birth of the fetus. Thus, starting from the 1960s, a period of extremely dense and profitable scientific research in the field of reproduction began which continues to the present day. The next step came in 1978 when Louise Brown, the first child conceived by in vitro fertilization, was born. From this moment on, human in vitro fertilization becomes over the years an increasingly common and safe practice and, reaching the present day, normalized as a reproductive method¹⁰.

⁸ Haldane, J.B.S. 1923. "Daedalus, or, Science and the Future." In *Heretics*, Cambridge, p. 10.

⁹ Fishel, S. (2018). First in vitro fertilization baby—this is how it happened. *Fertility and sterility*, 110(1), 5-11.

¹⁰ Elder, K., & Dale, B. (2020). In-vitro fertilization.

At this point, two new lines of research branch out. The first focuses on embryos and the attempt to make them develop longer and longer in an extrauterine environment. Following the birth of Louise Brown, the scientific community acknowledges the importance and the extreme potential that the study of embryo development would have represented for scientific progress. Nevertheless, the following year, a detailed report containing guidelines on how to develop embryonic cell research was published by the Ethics Advisory Board of the US Department of Health. It is 1979 and the 14-day rule comes into force which establishes that the fundamental condition for research on embryos is that these profits cannot be kept alive in vitro for longer than 14 days¹¹. From that moment on, this rule begins to be applied universally throughout the research world, making it one of the most internationally agreed rules in reproductive science and medicine to date¹². At the time of its creation, making an embryo survive in an extrauterine environment for 14 days represented a considerable challenge while nowadays, thanks to technological progress, this is no longer a problem. For this reason and above all to facilitate the progress of embryonic research, many scientists and researchers are calling for the 14-day rule to be revised or even abolished. This would allow us to study and analyze what happens from the fourteenth to the twenty-eighth day of embryo development. That is, it would allow us to analyze that moment of embryonic development which is defined by scholars as the 'black box' of human development¹³.

The second line of research, on the other hand, deals with trying to improve the survival of premature fetuses. In this second case, the development of neonatal intensive care was of fundamental importance. The first incubators for neonatal care of premature babies date back to 1960 and were only equipped with a system capable of managing and controlling the temperature and the quantity of oxygen inside them.

It is only ten years later, in 1970, that we can really start talking about real neonatal intensive care in hospitals and the first concrete data about the survival of premature babies around the 24th

¹¹ Pera, M. F. (2017). Human embryo research and the 14-day rule. *Development*, 144(11), 1923-1925.

¹² Ivi, p. 1923.

¹³ Appleby, J. B., & Bredenoord, A. L. (2018). Should the 14-day rule for embryo research become the 28-day rule?. *EMBO molecular medicine*, 10(9), e9437.

week. Despite this and despite the continuous progress in medical technology, the incidence of mortality of premature babies is still an important problem. In 2017 it was estimated that only one in five babies born before 23 weeks survives, and many of these still have irreversible complications due to problems related to underdevelopment of the lungs or caused by mechanical ventilation¹⁴. Furthermore, according to some research, both in the United States and in Europe, for the first time in almost a decade there has been a decrease in the overall survival rate of preterm babies in 2021. According to different sources, this data could be associated with the impact of the COVID-19 pandemic both from the physical point of view of the mother's health during pregnancy, but also from a process that has sometimes made access to intensive care more problematic and difficult.^{15 16}

In general, mortality in premature infants remains an extremely topical issue and the causes remain, to this day, still mainly associated with the underdevelopment of the newborn's lungs. For this reason, as I will deepen later in the next paragraph, a technology such as that of the artificial uterus turns out to be extremely important in this area. In fact, through the use of the artificial uterus it would be possible to avoid complications related to pulmonary underdevelopment for the newborn, allowing it to complete its development within a 'new' uterus.

And it is precisely from this second line of research, that is the attempt to deepen new methodologies and new therapies to increase the survival of premature fetuses, that the research for the production of the artificial uterus is concretely developed.

As mentioned, many steps forward have been made, but just as many still need to be made. The artificial uterus, in this regard, represents an extremely relevant tool but, as we will see below, which at the same time requires that an important and urgent ethical debate be developed. The

¹⁴ Prasad, Aarthi. 2017. "How Artificial Wombs Will Change Gender, Family and Equality." *The Guardian*, May 1, 2017

¹⁵ Bobei, TI, Haj Hamoud, B., Sima, RM, Gorecki, GP, Poenaru, MO, Olaru, OG, & Ples, L. (2022). The Impact of SARS-CoV-2 Infection on Premature Birth—Our Experience as COVID Center. *Medicina*, 58(5), 587.

¹⁶ March of Dimes. (2021). March of dimes 2021 report card reveals slight drop in preterm birth rate. <https://www.marchofdimes.org/news/march-of-dimes-2021-report-card.aspx#:~:text=March%20of%20Dimes%2C%20the%20nation's,nation%20keeping%20it's%20C%2D%20grade>

aim is to create a critical vision on this topic capable of underlining the potential of this new tool - protecting and deepening the real improvements that this could bring to neonatal care - but also managing to underline the limits that it can protect. the right of each person to choose to voluntarily terminate their pregnancy.

Nowadays, one of the most important questions within the realm of bioethics and, in general, in the sphere of freedom and reproductive rights is not to establish how far research and Development. The results obtained in the last decades clearly show how the speed of development and discoveries within the field of biotechnology is increasing exponentially. The problem, at this point, is to create a critical and moral evaluation system capable of analyzing the possible social implications that this type of technology could have on the life and decisions of individuals.

1.2 Ectogestation and artificial uterus today.

At this point I find it necessary to make a small technical-scientific digression to explain in detail what is the current situation regarding the latest developments regarding the artificial uterus. Explaining in detail not only the functioning, but also the future perspectives of the objectives that biomedical scientists and engineers plan to achieve in the short and long term allows us to have a clearer picture of the issue and, consequently, to be able to develop a more accurate and realistic critical analysis. Defining the current scientific situation is also useful for setting the discussion more clearly about the real effects that the artificial uterus could have on both a political and social level.

As mentioned above, reproductive technologies have been developing extremely fast over the past few decades. At this point it is no longer a question of whether it is possible to create an artificial uterus or not. The latter, as we will see in more detail shortly, already exists and has been tested with positive results through clinical trials carried out with the use of animals. At the moment, from the point of view of experimentation, the real problem seems to be that of developing clinical trials that involve the use of human embryos and fetuses and no longer animal ones.

The work carried out between 2016 and 2017 by the team of researchers at the University of Philadelphia represented the milestone for experimentation on the artificial uterus. In April 2017, the scientific communiqué was published in the journal Nature that would have totally changed

the debate on reproductive technologies¹⁷. The Philadelphia team showed they were able to develop an extra-uterine system - an artificial uterus - capable of supporting extreme premature lamb until the end of pregnancy. The researchers' decision to test their artificial uterus for the first time using sheep fetuses as their physiological characteristics are very similar to those of a human fetus during pregnancy¹⁸. The 2017 clinical trial concluded with the birth of a totally healthy lamb with the same characteristics and parameters as a lamb born through a natural birth. Consequently, the researchers are positive about the possible success of a similar clinical trial involving the use of human fetuses.

The development of this artificial uterus prototype, which the researchers called Biobag, has been far from simple or smooth. The main problem that the scholars found themselves having to face was the complex analysis and creation of a system that replaced the work done inside the uterus by the umbilical cord. In fact, this is not a secondary aspect of the matter. As mentioned previously, insufficient lung development is one of the crucial aspects that determine in most cases the major complications - and sometimes death - of extremely premature fetuses. Again, the umbilical cord plays a crucial role. In fact, the latter not only takes care of transporting the nourishment and substances necessary for the correct development of the fetus, but has the task of transporting the blood containing the oxygen necessary to allow cellular respiration and oxygenation of the internal organs of the fetus. The question of the development of the lungs and of the respiratory system in general represents a relevant case within the broader question of determining the moral status and viability of the fetus. I will return later in the thesis to analyze this question in more detail. At this moment it is interesting to underline the question to remember how the total development of the fetus's lungs represents an aspect of crucial importance, sometimes underestimated, in determining the viability of the fetus and, consequently, also its moral status.

Returning to the development of the Biobag, it remains necessary to underline a final fundamental aspect. This prototype of an artificial uterus was designed and developed to allow

¹⁷ Partridge, E. A., Davey, M. G., Hornick, M. A., McGovern, P. E., Mejaddam, A. Y., Vrecenak, J. D., ... & Flake, A. W. (2017). An extra-uterine system to physiologically support the extreme premature lamb. *Nature communications*, 8(1), 1-16.

¹⁸ Ivi, p. 5.

the development of the fetus only in the last weeks of gestation. In particular, what has been shown is that the Biobag is able to safely support the fetus for up to 4 weeks. This data, despite the stringent temporal limitation that is imposed, still remains extremely important and relevant within the world of neonatal intensive care because, as already mentioned, it would allow to avoid problems related to the respiratory system of newborns. Despite this, we must also consider the fact that the Biobag created in Philadelphia represents only the first working prototype of an artificial uterus and that therefore it would seem entirely plausible that the possible safe stay of the fetus in the artificial uterus could increase considerably in the immediate future.

In addition to the hope that over time technological development will contribute to improvements to the already existing Biobag prototype, it must however be considered that what was created in Philadelphia is not the only example of an artificial uterus ever experienced. Already several teams of researchers located in different states have been involved in the creation of very similar prototypes. Other examples of artificial uteri created to date are the EVE¹⁹ or EXTEND²⁰. Both of these two prototypes are designed to be used, in the same way as the Biobag, with animals and the operation is very similar to each other. In all cases it is an instrument capable of replicating the conditions of the uterus and acting as a real closed system in which the fetus is inserted together with the amniotic fluid²¹. At the time this thesis is written, research is being developed in different parts of the world to be able to develop a new prototype capable of being used in human clinical trials in the next five years²².

Worthy of note in this case is the research promoted by the University of Eindhoven which has

¹⁹ Miura, Y., Saito, M., Usuda, H., Woodward, E., Rittenschöber-Böhm, J., Kannan, P. S., ... & Kemp, M. W. (2015). Ex-vivo uterine environment (EVE) therapy induced limited fetal inflammation in a premature lamb model. *PLoS one*, 10(10), e0140701.

²⁰ Hornick, M. A., Davey, M. G., Partridge, E. A., Mejaddam, A. Y., McGovern, P. E., Olive, A. M., ... & Flake, A. W. (2018). Umbilical cannulation optimizes circuit flows in premature lambs supported by the EXTra-uterine Environment for Neonatal Development (EXTEND). *The Journal of Physiology*, 596(9), 1575-1585.

²¹ Horn, C. (2022). Ectogenesis, inequality, and coercion: a reproductive justice-informed analysis of the impact of artificial wombs. *BioSocieties*, 1-22.

²² Bonito, V. 2019. Multimillion grant brings artificial womb one step closer. Eindhoven University of Technology, October 8; <https://bit.ly/3fio37S>.

been working for years, with the help of economic funding from the European Union, on the development of a Perinatal Life Support (PLS) system capable of to continue the development of premature babies in an extrauterine environment²³. The fundamental aspect of their research is that it was decided not to test the prototype directly on human or animal fetuses. For this reason, special mannequins have been created equipped with sensors capable of simulating an extremely premature baby and thus being able to test the effectiveness of this new instrument.

1.3 Development of the artificial uterus: what kind of consequences?

In the course of the next chapters I will have the opportunity to take up again the theme of the consequences that the development of the artificial uterus could have within society and for reproductive freedom in general.

At this point it is in my opinion important to lay the foundations for what will be my subsequent arguments on this question and above all to make some fundamental premises. In general, the fundamental reason why, to date, the various prototypes of artificial uterus are studied and designed is to be able to continue the path started with the development of the incubators used in neonatal intensive care.

In other words, the only prospect of use with which the artificial uterus is now filled is that of being able to create a new therapeutic support tool for premature babies²⁴.

From a purely medical point of view it would seem that this new technology represents only a huge step forward in biomedical research capable of saving hundreds of thousands of newborns worldwide every year²⁵.

At this point it is necessary to introduce the terminological and conceptual differentiation between partial ectogenesis and total ectogenesis. The term 'ectogenesis' refers to the process of development of a fetus that takes place in an extrauterine environment. This term comes from

²³ Solerte, M. L. (2020). Artificial uterus-research background to improve survival and outcome of extremely low birth weight newborns. *Journal of Gynecological Research and Obstetrics*, 6(3), 067-071.

²⁴ Horn, C. (2020). Ectogenesis is for Feminists: Reclaiming Artificial Wombs from Antiabortion Discourse. *Catalyst: Feminism, Theory, Technoscience*, 6(1).

²⁵ Ivi, p. 1.

the Greek 'ecto' which means external or outside and 'genesis' which means creation or generation²⁶. Ectogenesis can be full or partial. In the first case we refer to a situation in which the development of the fetus takes place totally outside the maternal uterus. The embryo in this case would be created by IVF and then transferred to an artificial uterus where it would be able to complete its development²⁷. In the second case, however, the embryo already develops inside the maternal uterus and, only at a later time, is it moved inside the artificial uterus where it completes its formation. Considering the current state and development of this type of reproductive technology, it seems highly unlikely that total ectogenesis will become a real and viable process in the immediate future. For this reason, from this moment on, I will use the term ectogenesis - or rather the term ectogestation - in reference to the partial ectogenesis process. Once our field of interest has been outlined in a more specific way, we can move on to defining what could be the problems or ethical issues connected to it.

In reality, at this point, if the artificial uterus were to be considered solely as a therapeutic tool in the event of problems related to the fetus or life threatening the person in pregnancy, fundamental ethical or social problems would not seem to exist²⁸. Furthermore, at the moment, most researchers would seem to agree on the fact that there is no intention to use this new technology outside the therapeutic field on subjects who appear to be below the current limit of viability²⁹.

In the course of the next chapters I will explain in more detail why the concept of viability is so problematic within the question, at this moment it is enough to know that the term viability means the ability of the fetus or infant to survive independently. from the support of the mother³⁰.

What I believe to be important to underline at this time is how the artificial uterus constitutes a completely innovative tool, potentially capable of changing not only the limits of the concept of

²⁶ Edmonds, D. (Ed.). (2021). *Future Morality*. Oxford University Press.

²⁷ Räsänen, J., & Smajdor, A. (2020). The ethics of ectogenesis. *Bioethics*, 34(4).

²⁸ The only ethical issue that would need to be addressed is that of clinical trials and trials on human fetuses.

²⁹ Di Stefano, L., Mills, C., Watkins, A., & Wilkinson, D. (2020). Ectogestation ethics: The implications of artificially extending gestation for viability, newborn resuscitation and abortion. *Bioethics*, 34(4), 371-384.

³⁰ Ivi, p. 372.

viability but also of the ethical and moral concept we have of the fetus and, consequently, of the vision of abortion.

This turns out to be an extremely important consideration for the purposes of my discussion because it determines one of the fundamental issues in this field and, in particular, my interest in this new technology. The fact that there is even the only possibility of being able to use the artificial uterus on subjects below the viability threshold determines a unique and unprecedented ethical situation that needs to be investigated in depth.

Furthermore, some scholars have however stated that attempting to shift the concept of viability using the artificial uterus outside the therapeutic purposes in intensive therapies should nevertheless be considered, and should also be the subject of ethical discussion³¹. Analysis of relevant ethical issues, including patient selection, moral status, rights, obligations, and others should precede use of this promising technology in humans³².

In general, my aim is to underline the need for a profound evaluation not only of a moral, but also of a feminist and political-social nature, of this new technology. For this reason I have decided to analyze the question by taking a feminist bioethical vision that takes into consideration the issues related to self-productive justice. I do not intend to underestimate or deny the extreme importance that the artificial uterus can assume as a therapeutic tool. Despite this, I believe that, in light of the ever constant difficulties associated with defending the right to terminate a pregnancy, it is also necessary to consider the possible negative consequences to which a technology of this type could lead us³³.

In fact, there are two major issues that need to be analyzed.

The first concerns the interpretation given by some scholars³⁴ about the development of the artificial uterus which is intended as the final point of the debate on voluntary termination of

³¹ Ivi, p. 373.

³² Mercurio, M. R. (2018). The EXTEND system for extrauterine support of extremely premature neonates: opportunity and caution. *Pediatric Research*, 84(6), 795-796.

³³ The general idea is very similar to the moral theory of the slippery slope.

³⁴ Kaczor, C. (2005). Could artificial wombs end the abortion debate?. *The Edge of Life: Human Dignity and Contemporary Bioethics*, 105-121.

Stratman, C. M. (2021). Ectogestation and the problem of abortion. *Philosophy & Technology*, 34(4), 683-700.

Rodger, D. (2021). Why ectogestation is unlikely to transform the abortion debate: a discussion of 'Ectogestation and the Problem of Abortion'. *Philosophy & Technology*, 34(4), 1929-1935.

pregnancy. We could define this first macro-argument as the idea of ectogestation as the final solution to the abortion debate. I will deal with this specific question in depth in the second chapter. The second question refers more generically to the position of contemporary feminist bioethics on the use of the artificial uterus. As we will see below, the question is itself divided into two main sub-arguments. In the first case it will be important to try to analyze, in the light of the development of the artificial uterus, how the concepts of viability and the moral status of the fetus are modified and shaped. In other words, it will be necessary to investigate in detail how the positions of traditional bioethical theory change following the introduction of such a huge technological innovation. In the second case, however, the focus will be on the question of reproductive freedom and the determination of the current value of the termination of pregnancy. As discussed above, the artificial uterus itself does not assume a positive or negative moral value in an absolute way. Like many other bioethical issues, the proposed development and use of a technology such as the artificial uterus needs to be socially and historically determined, or analyzed according to the historical, political and social context in which it is placed. As stated by Claire Horn a reproductive justice approach allows us to situate claims about healthcare and choice within the structural, institutional, and relational contexts that shape the nature of this care and the extent to which choice can be exercised ³⁵. In other words, it is necessary that, especially in this historical moment in which we are witnessing continuous obstacles to the application of reproductive rights and people's choice, the question of the artificial uterus is critically analyzed in detail, taking into consideration the already existing discriminatory structures, of coercion³⁶ and inequality in which the artificial uterus would be placed.

2. Why does it makes sense to talk about abortion in relation to the artificial uterus?

³⁵ Horn, C. (2022). Ectogenesis, inequality, and coercion: a reproductive justice-informed analysis of the impact of artificial wombs. *BioSocieties*, 1-22.

³⁶ Horn, C. (2022). Ectogenesis, inequality, and coercion: a reproductive justice-informed analysis of the impact of artificial wombs. *BioSocieties*, p. 10.

In the first part of this chapter I dealt with reconstructing the current situation, from a scientific and technical point of view, of the latest developments regarding the artificial uterus and ectogenesis. I also explained what, in my opinion, are the issues that need to be urgently addressed, no longer from a technical point of view, but more from a political and social point of view.

In this second part of the chapter I deal with explaining and demonstrating why it is important and necessary to address this question in a critical and interdisciplinary way without neglecting the historical and social context in which we find ourselves. In this regard, my proposal is to take a feminist bioethics perspective that is extremely sensitive in detecting the links and issues related to reproductive rights and freedoms within this specific context.

In 2020 Claire Horn publishes a paper in which she formally and practically invites the feminist world to reclaim the debate on the artificial uterus from anti-abortion positions³⁷. The text in question clearly underlines how there is a real risk of misunderstanding the meaning and the main purpose not only of the creation of the artificial uterus, but also and above all of why the feminist world - and not only - is fighting for the right to abortion and reproductive freedom. The arguments expressed by Horn in relation to the artificial uterus are useful to me in this case to highlight the extreme relevance of feminist bioethics within the bioethical panorama in general. In fact, since the birth of medical ethics many theorists have tried to answer moral dilemmas, such as abortion, by referring to traditional theories such as utilitarianism or Kantian deontology. It was immediately clear, however, that the simple reference to theories and principles was not sufficient to provide a sufficiently adequate analysis to deal with specific and *real* posed by the dilemmas of medical bioethics.

The obligation to do to others their good is a fundamental one. However, the obligation as such is abstract. Only in concrete contexts can one determine the extent of the obligation, and how to rank the various goods that can be at stake.³⁸

³⁷ Horn, C. (2020). Ectogenesis is for Feminists: Reclaiming Artificial Wombs from Antiabortion Discourse. *Catalyst: Feminism, Theory, Technoscience*, 6(1).

³⁸ Engelhardt Jr, H. T. (1996). *The foundations of bioethics*. Oxford University Press, p. 92.

The principles provided by moral philosophy are sometimes too abstract to refer to concrete questions and cases.

However, as Susan Sherwin argues, many thinkers tied to traditional moral theories have a hard time recognizing these kinds of issues. The critique of traditional ethics argues that both Kantian deontology and utilitarianism, in formulating their theories, in any case refer to specific contexts and are therefore devoid of a genuinely universal value³⁹.

The feminist position and in particular that of feminist bioethics are posed differently with respect to the question. In an attempt to provide more *concrete*, moral questions focus on the need to recognize the distinction between individuals on the basis of their role within the structure of domination and subordination⁴⁰, that is, within the inevitable power structure on which the historically determined society.

According to the conception of feminist bioethics, issues related to abortion - and consequently the artificial uterus - can be understood as issues not only abstractly moral, but also as practical issues relating to the perpetuation of oppression against specific groups of people. Oppression, however, is a phenomenon that is difficult to analyze solely from an abstract point of view. For this reason, a reference not only purely moral, but also socio-political in the analysis of the possible implications connected to the development of the artificial uterus is inevitable.

However, Held points out, and it is with this that I specifically agree, that we will need some principles in any case; however, principles regarding relationships will be needed and not just the actions of individuals⁴¹.

The perspective of feminist bioethics therefore remains in my opinion the most appropriate analysis tool to reformulate this type of debate. Feminist bioethics, on the other hand, attempts to emphasize and analyze the ways in which the conception of gender distorts people's view of the world⁴². The main argument that is supported by this type of bioethics is that gender issues

³⁹ Sherwin, S. (2008). Whither bioethics? How feminism can help reorient bioethics. *IJFAB: International Journal of Feminist Approaches to Bioethics*, 1(1), 7-27.

⁴⁰ Sherwin, S. (1992). *No longer patient: Feminist ethics and health care*. Temple University Press, p. 80.

⁴¹ Held, V. (1995). *Justice and care: Essential readings in feminist ethics*. Routledge.

⁴² Little, M. O. (1996). Why a feminist approach to bioethics?. *Kennedy Institute of Ethics Journal*, 6, p. 1.

shape not only our conception of "man" and "woman", but also fundamental concepts such as motherhood and femininity with all the consequent judgments of consequent value. For this reason it is essential to focus attention not only on a purely moral vision, but also on the consequent political-social and gender connotation.

In other words, the effort required in this case is to undertake a broad-spectrum analysis of the question that it is no longer sufficient to address by means of an abstract normativity that absolutely establishes what is morally correct or incorrect. The aim must be to be able to act actively within the current society without ignoring the real problems that exist within it.

It is not possible not to consider the fact that the woman is the one and only subject of the pregnancy and that consequently her motivations, her experience and her needs must be treated as such. The traditional debate, as well as the institutions that deal with legislation, seems to look at the reality of the facts in a myopic way.

Much of the legislation on abortion in the Western world is no longer sufficient because it is based on principles that are too weak to deal with both current social problems and the scientific and technological development that is taking place.

For these reasons, at this moment, it is necessary to focus both academic and public attention not only on the debate on the right to abortion, but also on technologies and reproductive freedoms. To do this, I believe it is necessary to open a debate that starts from bioethics, but does not end in this field. To have the opportunity to identify and try to resolve all the problems that take root in this debate and then turn into different issues. Because defending the right to voluntary termination of pregnancy is not only important for women who decide to request it. Starting from the simplest consideration that the freedom to *choose* to have a child, as opposed to *being forced* to have one, characterizes the experience of being a parent totally and above all in a positive way. Furthermore, deciding to have an abortion in a certain period of one's existence does not exclude the desire to be a parent at another time and in other conditions. Having the right to a free and unconditional choice directly determines the consequent free choice to be a parent.

We now come to the question of the public and social relevance of the artificial uterus. In this regard, already in 1971 Judith Thomson had shown in her famous paper 'A Defense of Abortion' that although the fetus had the right to life, this right also logically implied that there was also a

right, on the part of the fetus, to use of the mother's body to allow her own survival⁴³. In other words, the fetus, although the holder of the right to life, does not have the right to use the body of others and therefore the woman has the right to exercise her choice, although the exercise of this right entails the death of the fetus itself. The problem at this point arises in demonstrating how the pregnant person actually continues to have the right, in the light of the existence of a technology such as that of the artificial uterus, to terminate the pregnancy through the death of the fetus. In this regard, several thinkers have stressed that, in the light of the artificial uterus, the pregnant person would no longer be entitled to the death of the fetus since there is the possibility of terminating the pregnancy in any case while keeping the fetus alive⁴⁴. In the next chapter I will analyze this position in more detail, demonstrating not only how the idea of equating abortion with ectogestation is completely anachronistic⁴⁵, but also how it is not possible, from a feminist point of view, to accept the imposition of the use of artificial uterus as an alternative to voluntary termination of pregnancy. Quoting Claire Horn, the strategies within feminism implemented to protect and safeguard reproductive care, including abortion, have never been a monolith and the feminist discourse on why abortion must be protected cannot be reduced to choice-based justifications focused solely on protecting the right to terminate a pregnancy⁴⁶.

CHAPTER 2

In this second chapter I would like to discuss the idea of the artificial uterus as a technological 'solution' from two different perspective. In the first case I show how it would be misleading to talk about the artificial uterus as the main solution to gender discrimination by referring to the

⁴³ Thomson, J. J. (1976). A defense of abortion. In *Biomedical ethics and the law* (pp. 39-54). Springer, Boston, MA.

⁴⁴ Blackshaw, B. P., & Rodger, D. (2019). Ectogenesis and the case against the right to the death of the foetus. *Bioethics*, 33(1), 76-81.

⁴⁵ Horn, C. (2020). Ectogenesis is for Feminists: Reclaiming Artificial Wombs from Antiabortion Discourse. *Catalyst: Feminism, Theory, Technoscience*, 6(1).

⁴⁶ Ivi, p. 8.

thought of Anna Smajdor. In the second case I answer instead to the thesis according to which it is possible to consider the artificial uterus as a technical solution to the abortion debate. The aim, once again, must not be – necessarily – to 'eliminate' pregnancy. This is not the ultimate goal that scientist and researcher are trying to achieve through the development of the artificial uterus. Moreover, the elimination of pregnancy is not even the end that most of feminist thinkers are trying to achieve because, as already mentioned, the causes of gender inequality cannot be traced back solely to the reproductive role of the woman. To show this, in the first part of the chapter I need to show how, in general, the artificial uterus cannot be understood as the end point of the debate on abortion taking into account the thought of Christopher Stratman. In the second part, however, I deal with specifically analyzing the radical feminist position regarding the artificial uterus. This last part will be useful to bring to light a different perspective on the question of ectogenesis understood as a 'solution'. The focus, however, in the latter case will be on the problematic no longer of abortion, but of pregnancy in general.

1 Partial ectogestation as a solution to the 'problem' of abortion

At this point in the discussion it is necessary to address one of the most important issues related to the possible ethical consequences to which the artificial uterus could lead us. In fact, several scholars⁴⁷ have long started a debate within the academic world to demonstrate how, in the light of the existence of a technology such as that of the artificial uterus, it would therefore be possible to say that the debate on the voluntary interruption of pregnancy is concluded. A small technical note before going into the heart of the matter. In this part of the text I will use the term ectogestation always in reference to the partial ectogenesis which, as already mentioned, the completion, outside the maternal uterus, of a pregnancy that started in a natural way. As already

⁴⁷ Kaczor, C. (2005). Could artificial wombs end the abortion debate?. *The Edge of Life: Human Dignity and Contemporary Bioethics*, 105-121.

Stratman, C. M. (2021). Ectogestation and the problem of abortion. *Philosophy & Technology*, 34(4), 683-700.

Rodger, D. (2021). Why ectogestation is unlikely to transform the abortion debate: a discussion of 'Ectogestation and the Problem of Abortion'. *Philosophy & Technology*, 34(4), 1929-1935.

mentioned above, it is necessary to underline how the artificial uterus, which is indispensable for the ectogestation, was initially torpedoed with the attempt to decrease neonatal mortality in different situations. The artificial uterus would therefore represent, according to the researchers, a tool to be associated only with neonatal intensive care in the event that the fetus is born prematurely (and therefore not yet fully developed) or in the event that a person due to health problems – and therefore not by his will – is not able to continue with the pregnancy⁴⁸.

It is necessary, and interesting, to underline that this new technology has not been developed to solve or create an alternative to voluntary abortion as it is not designed to solve problems inherent in the first part of pregnancy. Despite this, and in the light of the continuous technological progress in the medical-scientific field, it becomes more and more urgent and common to ask whether this new technology can somehow affect, or even resolve, the debate regarding the termination of pregnancy.

Christopher Stratman, like many other thinkers⁴⁹, is currently one of the main exponents of the theory that the artificial uterus would be able to put an end to the debate on abortion. This last defends the perspective that a woman, although she holds the right to voluntary termination of pregnancy, still does not have the right to the death of a fetus when it can be *safely* removed from the mother's womb, and conclude the gestation period in an artificial uterus⁵⁰. In other words, Statman's thesis argues that the debate on abortion could be considered concluded as ectogestation would allow the woman to exercise her autonomy – effectively interrupting the pregnancy – permitting, at the same time, the survival of the fetus. My attempt in this regard is to show the inconsistency of his argument. Although Statman argues that the only way to reject his thesis is to show how that the woman actually holds the right to death of the fetus, I will not use, at least not primarily, this type of counter-argument. On the other hand, I find it extremely urgent to treat the topic from a feminist bioethical perspective that manages to focus on the experience of women by bringing to light and recalling the effects of social, political or epistemic power. Although my

⁴⁸ Rodger, D. (2021). Why ectogestation is unlikely to transform the abortion debate: a discussion of 'Ectogestation and the Problem of Abortion'. *Philosophy & Technology*, 34(4), p. 1933.

⁴⁹ Singer, P., & Wells, D. (1984). *The reproduction revolution: new ways of making babies*. Oxford University Press.

⁵⁰ Stratman, C. M. (2021). Ectogestation and the problem of abortion. *Philosophy & Technology*, 34(4), p. 683.

aim is not to show how the woman has the right to the death of the fetus, I support some theories that prove this argument. The emphasis, however, will be placed on the concept of viability and to show how, despite the ectogestation modifies this concept, the right, and the moral status of the termination of pregnancy is not affected. In a second moment, I deal more generally with the properly feminist arguments in defense of abortion and which constitute, in my opinion, the fundamental arguments against the ectogenetic solution.

The thesis presented by Stratman proceeds in a linear manner according to the following and is defined by the author himself as "The Main Argument":

(M1) Either the fetus is a person or not. (M2) If the fetus is a person, then given the possibility of ectogestation, at least in most cases, a woman does not have the right to the death of the fetus, though she has the right to end her pregnancy. (M3) If the fetus is not a person, then given the possibility of ectogestation, at least in most cases, a woman does not have the right to the death of the fetus, though she has the right to end her pregnancy. (M4) Therefore, it does not follow from a woman's right to end her pregnancy that she likewise has a right to the death of the fetus.⁵¹

According to Stratman, the moral status of the fetus does not make any substantial difference because, in both cases, the person that is pregnant does not have the right to the death of the fetus when it is possible to safely transfer it from a human womb to an artificial one. There are two preliminary considerations that need to be made at this point. The first one refers to the criterion of potentiality. In exposing and demonstrating his main argument Stratman repeatedly refers to the fact that there are people who, unlike the woman who decides to have an abortion, are willing to care for and raise the fetus⁵². Although the argument develops from a first premise (M1) which can be described as essentially neutral, I argue that stating and including within the argument that someone else can take care and, in particular, providing the "required care" confers – more or less implicitly – the property of potentiality to the fetus. This makes, in my opinion, (M1) and the

⁵¹ Stratman, C. M. (2021). Ectogestation and the problem of abortion. *Philosophy & Technology*, 34(4), p. 686.

⁵² Stratman C., Ectogestation and the Problem of Abortion, *Philosophy and Technology*, 2020, p. 1.

whole argument not so independent from the moral status of the fetus as is instead declared by the author. The second premise consists in underlining how Stratman's whole argument is based on an ideal situation in which the ectogenesis constitutes a safe practice, equally developed everywhere and, above all, available since the first weeks of pregnancy⁵³. Although I understand the author's motivations for considering his argument in the light of such a premise, I still think it is too 'ideal' for such a topic. I will come back to that later, with more emphasis on this argument. Right now it is useful for me to show how 'The Main Argument' is already problematic from two different points of view. In addition, another important issue that is left out by Stratman within his argument is that at the moment, but presumably even in the future, ectogenesis does not represent a practice without risks and problems for the pregnant person. Regardless of the possible further technological developments that the practice of ectogenesis could assume, this will always require you to practice a caesarean section on the pregnant person⁵⁴. The implementation of the latter practice presents two main problems. The first question to consider is that, although caesarean section is now a routine practice in the Western world, this still represents a real surgical operation with all the risks and problems connected to it. Thousands of people give birth every day through this mode but, despite this, it is still possible that these people run the risks associated with an operation of this type⁵⁵. More generally, however, it has been proven that a birth by caesarean section is much more traumatic and debilitating for the person compared to a natural birth from which, in most cases, recovery is much faster and less problematic. Beyond the possible complications related to the practice of caesarean section, there remains another important issue to be analyzed. Stratman in his argument overlooks the fact that since the caesarean section is a

⁵³ In the original paper wrote by Stratman there is a footnote in the end of the premise (M3) that literally declared that his main argument is entirely based on the ideal situation in which the artificial womb and the ectogestation would be available for everyone, everywhere. I totally understand that in an academic perspective is sometime more useful to consider ideal situation instead of considering every possible variable of the issue. Nevertheless, I think that this is a situation that requires to be analyzed taking into account the practical and specific situations that are socially and historically determined.

⁵⁴ Only if we want to apply partial etogenesis, in the case of total ectogenesis this problem would not exist but, as already mentioned, we refer in this case only to partial ectogenesis and not to the total one.

⁵⁵ Bertoli, P., Grembi, V., Hesse, C. L., & Castelló, J. V. (2020). The effect of budget cuts on C-section rates and birth outcomes: Evidence from Spain. *Social Science & Medicine*, 265.

real surgical operation, this requires the person to give his informed consent to the doctors to continue with the operation⁵⁶. This may seem a non-central issue for the purposes of the treatment but instead it turns out to be extremely important both from a practical point of view and from a theoretical point of view. In other words, the fact that the ectogestation process requires going through the practice of c-section, underlines how this situation is essentially and inevitably reducible to a question of the personal autonomy of the pregnant person and his own personal freedom. This is a problem for arguments such as those of Stratman that try at all costs to presuppose the rights and potential of the fetus to personal freedom and autonomy of the person. Requiring that, regardless of the person's will to terminate the pregnancy, the fetus be 'saved' by transferring it to an extrauterine environment would require, upstream, the approval of the subject himself to undergo a surgical operation that requires in itself the informed consent. The answer that Stratman, and other authors in line with his thought, could give to this type of argument is that the person actually has the right to choose to terminate his pregnancy but that, this right, does not consequently imply the right on the part of the person to the death of the fetus. The problem, however, is that, as mentioned, upstream there is an even greater right, or the right of the person to oppose a surgical operation – sometimes even against medical opinion – which makes all his argument and the theory connected to it highly problematic and not feasible. I will address again later the question of how, in my opinion, Stratman's theory is excessively ideal and abstract. At this point it is instead sufficient for me to have shown how, the practice still represents a situation not totally free of risks and that would still require the approval and consent of the person concerned who potentially, if he already wished to irreversibly interrupt the pregnancy, could use the question of consent to the practice of caesarean section to prevent the use of the artificial uterus.

Leaving aside these issues, which are intended to be only preliminary and introductory considerations, I now pass to a more specific analysis of Stateman's arguments. Even if it is not the primary interest of my work, I want to illustrate, following the argumentation of Joona

⁵⁶ Kirane, A. G., Gaikwad, N. B., Bhingare, P. E., & Mule, V. D. (2015). "Informed" consent: an audit of informed consent of cesarean section evaluating patient education and awareness. *The Journal of Obstetrics and Gynecology of India*, 65(6), 382-385.

Räsänen, that is possible to demonstrate that there is a real right to the death of the fetus⁵⁷.

Räsänen's position about the right of the person to the death of the fetus, derives from the consideration of the fact that abortion does not ontologically end with the practical termination of pregnancy, but includes the desire and the will to not be parents.

This point turns out to be extremely important for the purpose of my argument because it is useful for me to demonstrate how, even if arguments such as Stratman's were accepted, there would still be an additional right on the part of pregnant people not to want to become parents and therefore to interrupt the pregnancy itself not by simply moving the fetus, but through his death. The argument that is deduced from Räsänen's thesis is that there is a strong difference between the voluntary interruption of pregnancy practiced through abortion and the decision to give the newborn for adoption following its birth. The result would seem to be identical, that is, a person x at a moment t is pregnant and decides that he does not want to continue the pregnancy. In both cases, either through abortion or through adoption, the same person x will find himself at a time t^1 no longer pregnant and not having from an ethical and legal point of view any child to take care of. Despite this, the author's main argument is that, although the result may seem essentially identical, so it is not and in fact there is a huge difference between the case of the voluntary termination of pregnancy through abortion and the decision to give the newborn for adoption. Räsänen in this regard states that, deciding not to terminate the pregnancy and opt for the adoption of the newborn, would cause harm to the people involved in the pregnancy due to parental obligations toward the child⁵⁸. In other words, abortion and adoption are neither ontologically nor socially comparable because in the first case the interested parties do not change their role at the social level while in the second case – albeit without the obligations and responsibilities connected in raising a newborn – the subjects change ontologically becoming biological parents.

Räsänen in this regard states how, becoming a biological parent, causes harm to the subjects because of parental obligation toward the child. Abortion represents precisely this interest on the

⁵⁷Räsänen, J. (2017). Ectogenesis, abortion and a right to the death of the fetus. *Bioethics*, 31(9), 697-702.

⁵⁸ Ivi, p. 699.

part of the parents to avoid these obligations⁵⁹. For this reason, the right to death of the fetus exists and must be able to be protected. Furthermore:

Several women reported that ectogenesis would leave them with a lingering sense of obligation toward the child, even if no legal obligation were maintained⁶⁰. (One would expect similar reports from men; however, to our knowledge, no such studies have been conducted.)⁶¹

In summary, I am trying to analyze what the consequences could be in the event that a person who wishes to terminate a pregnancy – and therefore wishes not to be a parent neither biological nor social – would no longer have the right to do so given the existence of the artificial uterus and the ectogestation. In this case I showed how, although the fetus would be moved to another 'place' to continue its development and, from a social point of view, the person would no longer have any right or duty towards him, a problematic situation is still outlined for the person himself. In fact, although there is no longer the level of legal responsibility towards the future unborn child, many theorists have shown how the ectogestation could still harm the people involved in pregnancy. Specifically, it is argued that the right to death of the fetus is necessary to prevent certain harms from befalling the biological parents⁶². The damages referred to in this case are related to the fact that the parents would still feel morally responsible for the newborn and this would at least cause significant psychological damage. This felt obligation may be either self- or socially imposed. In the first case, a biological parent may feel that she has abandoned her child⁶³. In the second case, however, a variable comes into play that is described by Glenn Cohen through the use of the term 'attributional parenthood'⁶⁴, or the social attitude in which others treat a genetic

⁵⁹ Räsänen, J. (2017). Ectogenesis, abortion and a right to the death of the fetus. *Bioethics*, 31(9), p.700.

⁶⁰ L. Cannold. Women, Ectogenesis, and Ethical Theory. *J Applied Phil* 1995; 12: 55–64. It is worth noting the date of this study (1995), as well as its limited sample (45 Australian women). It is of course possible that attitudes have changed, or that this sample was in some sense unrepresentative. These differences would be important to the argument, since it seems to rely heavily on the fact that such attitudes are sufficiently widespread.

⁶¹ Mathison, E., & Davis, J. (2017). Is there a right to the death of the foetus?. *Bioethics*, 31(4), p. 315.

⁶² Ivi, p. 315.

⁶³ Ivi, p. 315.

⁶⁴ I. G. Cohen. The Right Not to Be a Genetic Parent. *South Calif Law Rev* 2008; 81: 1115–11965

parent as though she still has the same moral obligations to the child as a custodial parent, even when the legal system has absolved her of such obligations⁶⁵

Despite this, Stratman replies several times to these types of considerations by arguing that a trauma, or more in general a situation similar to the one mentioned above, are likely to occur only in the case of adoption following nine months of pregnancy and not in the case of ectogestation⁶⁶. Leaving aside the consideration that the decision to terminate a pregnancy is always a difficult choice for a person, and that it is not commensurable to her months of pregnancy; the problem with this kind of argument is that it always underlies the aforementioned ideal conception that the practice of ectogestation is available from the very first weeks of pregnancy, which is currently not possible. I have raised this point to demonstrate how, in many cases, adoption as ectogestation, could be understood by people as an "irresponsible abdication of their maternal responsibilities"⁶⁷. This means that even without the right to the death of the fetus, the possibility of ectogestation is unlikely to affect women's decision-making if adoption is perceived as being psychologically distressing⁶⁸. Stratman's position appears to be very similar to the one suggested by Singer and Wells when they argue that ectogenesis will cause anti-abortion and pro-choice advocates to "embrace in happy harmony"⁶⁹. Ectogestation in this case would represent a "non-lethal" substitute for voluntary abortion, condensing the will and ideologies of both people in favor of abortion and people who are against it.

If the feminist argument for abortion takes its stand on the right of women to control their own bodies, feminists at least should not object. Freedom to choose what is to happen to one's body is one thing; freedom to insist on the death of a being that is capable of living outside one's body is another.⁷⁰

⁶⁵ Mathison, E., & Davis, J. (2017). Is there a right to the death of the foetus?. *Bioethics*, 31(4), p. 315.

⁶⁶ Stratman, C. M. (2021). Replies to Kaczor and Rodger. *Philosophy & Technology*, 34(4), 1941-1944.

⁶⁷ Cannold, L. (1995). Women, ectogenesis and ethical theory. *Journal of applied philosophy*, 12(1), 55-64.

⁶⁸ Rodger D., Why Ectogestation is unlikely to transform the abortion debate: a Discussion of "Ectogestation and the problem of Abortion", *Philosophy and Technology*, 2020, p. 3.

⁶⁹ Singer, P., & Wells, D. (1984). *The reproduction revolution: new ways of making babies*. Oxford University Press, p. 135.

⁷⁰ Ivi, p. 135.

In this way Singer and Wells, but in my opinion also Stratman, place the conception (and rights) of the woman on the same level as those of the mother. Abortion, from a feminist point of view, cannot be reduced to a woman's right to terminate the pregnancy. As argued by Sarah Langford, termination of pregnancy is but a means to an end and the end is preventing motherhood⁷¹. In this way, despite the fact that the woman has the right to the death of the fetus or not, the focus shifts to the reasons that lead the first to decide to terminate the pregnancy. Are these arguments (namely the decision to not be a mother and not simply the act "of moving" the fetus from the womb) which I consider fundamental in response to the vision of Stratman.

Another important argument, in line with the thesis according to which there is a right to biological non-parenthood, is that of the property and genetic heritage connected to the fetus.

The argument in this case proceeds as follows:

1. The fetus is property of the genetic parents.
2. People can destroy their property.
3. Therefore, genetic parents can destroy their fetus.⁷²

The attempt in this case is again to show how the obligatory use of the artificial uterus and partial ectogenesis is morally unjustified to replace the voluntary interruption of pregnancy. Recently, William Simkulet drew attention to the above argument by showing how shifting the focus to whether the fetus belongs to the parents is not only problematic, but also useless. I share some of his view. Defining the fetus as 'property' might seem like a completely immoral or illegitimate assumption. It could be argued in many possible ways that nowadays the idea that children do not belong to parents who are only, from a legal point of view, guardians of the subject, is normalized and accepted within most Western societies.

At the same time, however, it is necessary to underline how, especially in the case of minors, the 'power' of choice of the parents is of fundamental importance. Consider the following two

⁷¹ Langford, S. (2008, July). An end to abortion? A feminist critique of the 'ectogenetic solution' to abortion. In *Women's Studies International Forum*, Vol. 31, No. 4, p. 226.

⁷² Rasanen Räsänen, J. (2017). Ectogenesis, abortion and a right to the death of the fetus. *Bioethics*, 31(9), 697-702.

situations. In the first case, a couple decides to freeze their embryos in order to implant and use them later. In this case, when the collection of gametes takes place and consequently the production of embryos that will then be preserved. A very large amount of embryos are generally produced, sufficient to have not only a margin of choice, but also a margin of error. Subsequently, frozen and unused embryos can be destroyed under the will of the couple, i.e. the owners. In the second case, however, consider the situation in which a couple discovers that they have a fetus affected by some type of serious malformation that would affect the quality of their future life. In this case, according to most legislations, parents have the right to terminate the pregnancy as 'owners' and liable to the fetus itself.

In the first case it would be possible to counter by showing how the fetus and the embryo are not ontologically the same thing and that, therefore, they do not have the same moral relevance within the question or even the same moral status. Similarly, in the second case, the argument would proceed in the direction of establishing what is the moral status of the fetus concerned and, in particular, what could be the potential and life expectancy of the future subject who would come to birth.

The point of this type of argument is that it is based more or less explicitly on the determination of the moral status of the fetus. In fact, as Simkulet showed at the end, it all depends on what moral conception we have of the fetus and the moment of the beginning of life. The property rights argument stands or falls on the moral status of the fetus. If we assume fetuses lack moral status, there is little reasonable opposition to their destruction –whether in the womb, cryopreserved outside the womb, or during ectogenesis⁷³.

In the light of these arguments, it is not necessary to deal in particular with the question of the moral status of the fetus. In the next chapter I will analyze specifically this issue, underlining however how, the role of the pregnant person always remains central in order to defend and maintain the right to abortion.

⁷³ Simkulet, W. (2022). Ectogenesis and the Moral Status of the Fetus. *De Ethica*, 7(1), 3-18.

2 Issues related to total ectogenesis and the radical feminist position.

In the previous paragraph I addressed and analyzed one of the two main visions regarding the artificial uterus and the ectogestation intended as a 'solution' to the debate on abortion.

In this second part I would like to expose and analyze from a critical point of view the position taken by Anna Smajdor. I decided to address this issue because I find it relevant to emphasize that the feminist position is anything but monolithic in addressing the issue of the artificial uterus. In general, Smajdor is placed within the debate in a radical way by arguing that the evolution of the artificial uterus and, in particular, of the process of total ectogenesis is not only completely urgent and necessary, but also a moral imperative⁷⁴.

The author starts from two different considerations. The first is the idea that, nowadays, pregnancy is a completely barbaric act imposed on women⁷⁵. From this point of view, medical and technological research has failed in recent years because it has not considered pregnancy, and all the physical and psychological risks connected to it, as a matter that needs to be solved and 'cured'. From his point of view, as research is striving to find not only cures to extremely serious diseases and pathologies, but he is also working in the direction of reducing the risks and side effects associated with many procedures. Within this process of modernization and technological development, the process of childbirth and pregnancy in general has not undergone major improvements in recent decades⁷⁶. As the author states, even today thousands of people die or live with permanent damage related to childbirth or pregnancy. Fifteen percent of all pregnant women develop potentially life-threatening complications.¹⁸ Over the years 2000–2002, the overall maternal mortality rate in the United Kingdom was 13.1 maternal deaths per 100,000 maternities.¹⁹ Pregnant women are likely to suffer health problems including back pain, exhaustion, bowel problems, and urinary incontinence extending for 6 months after delivery and beyond. The prevalence in particular of fecal incontinence following childbirth is something that has only just

⁷⁴ Smajdor, A. (2007). The moral imperative for ectogenesis. *Cambridge Quarterly of Healthcare Ethics*, 16(3), 336-345.

⁷⁵ Ivi, p. 341.

⁷⁶ However, it must be considered that childbirth and pregnancy in general has undergone improvements. Of course, over time medical and technological knowledge has increased, but despite this the scientific world has never moved in the direction of trying to eliminate any problem connected to childbirth.

begun to be recognized, and it has been suggested that for this reason alone, "natural" birth should be something for which women give informed consent based on a full understanding of these risks⁷⁷. The general idea, which I partly share, is how a kind of romanticization of pregnancy and childbirth has been formed over time, which has contributed in part to neglecting possible technological improvements in this field.

I will come back to this question shortly. The second question that is presented within Smajdor's theory is that according to which eliminating the process of pregnancy would allow to definitively implement the process of liberation of women from the patriarchal system and power in which she is inserted within society⁷⁸. From this point of view, the artificial uterus and total ectogenesis would represent a true revolutionary act to which the liberation of women from the sphere of reproduction and care would inevitably follow. If we were able to completely 'move' pregnancy outside the human womb we would be able to free women from their generative social role and at the same time make pregnancy an entirely social issue.

As mentioned, I partly agree with the arguments put forward by the author. On the one hand, I fully share the idea that for too long the idea of pregnancy has been extremely romanticized on a social level. The result is that sometimes it is possible to justify, especially during natural childbirth, completely extreme conditions – although not risky for both the mother and the newborn – which could be remedied by the aid of painkillers or surgical delivery. This is not the place to specifically analyze the reality of obstetric abuse of women, but it is still necessary to emphasize that these still represent a significant reality within the narrative of pregnancy and that they need to be brought to light and resolved⁷⁹. At the same time, however, I do not agree in general with the idea of eliminating pregnancy as a solution to all these kinds of problems. Let me explain, the issues raised by Smajdor are extremely important and fundamental for the bioethical and feminist debate, but at the same time I do not believe that these are solely rooted within pregnancy. This

⁷⁷ The Moral Imperative for Ectogenesis p.5

⁷⁸ Ivi, p.1.

⁷⁹ Lukasse, M., Schroll, A. M., Karro, H., Schei, B., Steingrimsdottir, T., Van Parys, A. S., ... & Bidens Study Group. (2015). Prevalence of experienced abuse in healthcare and associated obstetric characteristics in six European countries. *Acta obstetricia et gynecologica Scandinavica*, 94(5), 508-517.

type of vision, taken to the extreme, could be discriminating against people who wish to have a natural pregnancy and birth. In other words, it seems that a position is being taken according to which the 'liberation' of women can only take place through the elimination of their reproductive function. The oppression of women and their 'reduction' to productive agents is not directly caused by the process of pregnancy but, on the contrary, the fulcrum and roots of these problems must be sought in external social paradigms that would not be solved automatically by total ectogenesis.

'Moving' the place where pregnancy occurs is not the solution to the gender discrimination suffered by women within society. Moreover, this view does not seem to take into account the fact that even if total ectogenesis were possible from a technical point of view, it would probably not be accessible in a non-discriminatory way within society. It makes sense to think about the process of ectogenesis – both partial and total – in line with the other types of reproductive technologies currently available. The latter, such as artificial insemination or medically assisted procreation, have become a reality within our society which, however, mainly due to the high costs, are far from accessible to everyone.

CHAPTER 3

In the previous chapter we dealt with demonstrating how it is not possible and or desirable to consider the artificial uterus as the end point and the solution to the debate on the voluntary interruption of pregnancy. In this third and final chapter, which will constitute the pars construens of my argument, I will instead deal with analyzing how the artificial uterus and ectogenesis could shape and influence other issues concerning pregnancy. In particular, I will analyze the complex question concerning the concept of viability and moral status of the fetus in relation to theories of reproductive freedom.

1 Ectogestation and the construct of viability

The concept of Viability in recent decades has been extremely important not only at the ethical level within the debate on the moral status of the fetus, but also and above all at the legal and legislative level. Viability can be described as the ability of the fetus or infant to survive

independently from the support of the mother⁸⁰. It is necessary to underline how this concept, however, is not without problems and indeed, is the subject of various criticisms⁸¹. These are based on the awareness of the impossibility of establishing, in a safe and above all absolute way, the exact moment in which the fetus is able to survive autonomously outside the woman's body. In addition to this, it is necessary to consider how once the medical experience reported cases of fetuses that survived a premature birth only if this occurred in the last weeks of pregnancy; with the advent of new technologies, on the other hand, we are witnessing, more and more frequently, the birth and survival of fetuses already at the twentieth week, thus making the concept of viability extremely relative. In particular, it must be considered that the survival of the fetus does not depend solely on medical-technological development in general, but also and above all on medical development and the availability of tools and equipment specific to each area and geographical area. In fact, as Peter Singer notes, "A fetus has a better chance of surviving at the twentieth week of gestation in a Melbourne hospital than one in Alice Springs⁸²."

In general, the basic idea behind the concept of viability is that prior to a certain point in pregnancy fetuses are not yet viable as they would not survive if they were delivered. However, beyond the point of viability, fetuses may be liveborn and may survive⁸³.

Beyond these considerations, the concept of viability has been important to define the limit of

⁸⁰ Ectogestation ethics: The implications of artificially extending gestation for viability, Newborn resuscitation and abortion

⁸¹ Foster, No., Chudwin, D., & Wikler, D. (1980). The limited moral significance of 'fetal viability'. *Hastings Center Report*, 10(6), 10–13. <https://doi.org/10.2307/3560289>; Gert, H. J. (1995). Viability. *International Journal of Philosophical Studies*, 3(1), 133–142. <https://doi.org/10.1080/09672559508570807>; Gillon, R. (2001). Is there a 'new ethics of abortion'? *Journal of Medical Ethics*, 27(Extra 2), ii5; Glass, H. C., Costarino (Italy), A. T., Stayer, S. A., Brett, C. M., Cladis, F., & Davis, P. J. (2015). Outcomes for extremely premature infants. *Anesthesia & Analgesia*, 120(6), 1337–1351. <https://doi.org/10.1213/ANE.0000000000000705>; Jensen, D. (2015). Birth, meaningful viability and abortion. *Journal of Medical Ethics*, 41(6), 460–463; Erdman, J. N. (2017). Theorizing time in abortion law and human rights. *Health and Human Rights*, 19(1), 29–40; Pignotti (Italy), M. S. (2010). The definition of human viability: A historical perspective. *Acta Paediatrica*, 99(1), 33–36. <https://doi.org/10.1111/j.1651-2227.2009.01524.x>; Viability appears to be distinct from the question of whether the fetus is a "person." We will discuss in Section 3 the possibility that viability confers moral status; however, for the most part in this paper we will set aside questions relating to fetal personhood.

⁸² Singer, P. (1996). *Rethinking life and death: The collapse of our traditional ethics*. Macmillan. P. 102 - Both Australian cities, the first decidedly technologically advanced, the second not.

⁸³ Di Stefano, L., Mills, C., Watkins, A., & Wilkinson, D. (2020). Ectogestation ethics: The implications of artificially extending gestation for viability, newborn resuscitation and abortion. *Bioethics*, 34(4), 371–384.

some issues such as the voluntary interruption of pregnancy or the duty to intervene on premature fetuses. In the first case, in fact, viability serves to protect the woman in continuing with her free choice in wanting to terminate the pregnancy but, at the same time, protects the fetus that can survive autonomously outside the maternal body. The second case, on the other hand, is that which concerns the duty to resuscitation and intensive care of the newborn. At the moment when the moment of viability of the fetus is reached, the medical personnel are obliged to try to medically save the fetus.

In this regard, I find it interesting to analyze how the changes that ectogestation brings to the concept of viability can influence the debate on termination of pregnancy.

As already said, ectogestation was ideated with the aim of implementing the survival of preterm fetuses. The lower threshold in developed countries is usually placed between 22 and 24 weeks⁸⁴. It would seem plausible, according to some studies, that ectogestation represents a valid opportunity to increase this threshold and allow some newborns to survive even if born in some earlier stages of pregnancy.

In general, viability determines two different thresholds. The lower threshold is the moment when, although the baby is born, it would still be completely unreasonable to try to apply any medical therapy on the latter since the chances of survival would be practically nil at that point. The upper threshold, on the other hand, represents the limit in which, on the contrary, it would be completely unreasonable not to try to resuscitate or in any case apply medical therapies to try to save the newborn even if premature⁸⁵. In this sense, the advent of the ectogestation could change the limit of viability, but only the upper limit and not the lower one. To better grasp this concept we must refer to the issue that I addressed in the previous chapter about caesarean section. As mentioned above, to begin the process of ectogenesis and to 'move' the fetus from the maternal uterus to the artificial uterus, it is necessary that the person undergoes a birth by caesarean section. Again, as seen earlier, this requires the person to give their consent to the practice. This limitation rooted in personal freedom and in the person's right to autonomy, makes sure that the consent of the person

⁸⁴ By Stefano L., Mills C., Watkins A., Wilkinson D., Ectogestation ethics: The implications of artificially extending gestation for viability, *Newborn resuscitation and abortion*, *Bioethics*, 2020, No. 34, p. 380.

⁸⁵ Edmonds, D. (Ed.). (2021). *Future Morality*. Oxford University Press.

concerned is also crucial to ensure that ectogenesis takes place⁸⁶. In general, to try to understand how ectogenesis, the concept of viability and abortion are connected to each other we must consider the following situation. Let's imagine a line on which the different positions on the morality of abortion are divided. At the two extremes we will find the most radical positions of the pro-life and pro-choice respectively. In both cases although, as mentioned, the positions are totally opposite, it is possible to show how the evolution and application of a technology such as that of the artificial uterus and ectogenesis would not lead to any significant change for either vision. In fact, in the case of pro-life abortion is morally incorrect in any case and the artificial uterus would only act as a reinforcing in support of their vision. In the case of pro-choice positions, on the other hand, the right to abortion lies solely in the person's right to choose and disregards, in most cases, also the moral status of the fetus and the medical technologies available for its sustenance. In light of this, it would seem that the advent of this new technology does not significantly change, or at least from a moral point of view, the debate inherent in the legitimacy of the voluntary interruption of pregnancy. The problem, however, arises when, considering again the line mentioned earlier, the intermediate positions are analyzed. In the middle we find the position that perhaps turns out to be more relevant from a practical and social point of view, or the position taken at the legislative level by the states that decide to liberalize the voluntary interruption of pregnancy. The 'problem' related to these types of positions is that they make extensive use of the concept of viability to determine the limit below which it is possible or not for a person to decide to voluntarily terminate the pregnancy. From this point of view⁸⁷, the person has the right to exercise his right to choice but, at the same time, given that abortion is more ethically problematic for a 'viable' fetus⁸⁸, the right to choice is applicable only up to a certain point of pregnancy⁸⁹. In such a context, therefore, the fact that the existence of the artificial uterus can

⁸⁶ Ivi, p.

⁸⁷ That is the view taken by most Western democracies on the issue of abortion. These include the UK, most European countries and even the United States before the decision a few months ago that made abortion within the country unconstitutional.

⁸⁸ Edmonds, D. (Ed.). (2021). *Future Morality*. Oxford University Press.

⁸⁹ Or around the 24th week of gestation.

modify even the lower threshold of viability constitutes a problem for the right to terminate pregnancy. As pointed out by Wilkinson and Di Stefano, however, this risk depends very much both on the fact that it is not possible to clearly define what is meant by viability, but also on the fact that gradually moving the lower limit would create a profound inconsistency between neonatal care and obstetric care (including therefore the right to terminate pregnancy)⁹⁰. This would mean that, all things being equal, two fetuses that are at the same stage of development and could be 'kept alive' through the use of the artificial uterus could have two totally different fates. This creates inconsistency on an ethical level and could turn into the limitation of the time available to the person to decide to terminate their pregnancy. The question of viability, as shown, is far from linear and above all depends on a very wide set of factors including the determination of the moral status of the fetus which in this case, is extremely relevant. In light of all this, I believe that more than talking about the concept of viability it is more correct and exempt to speak of the social construct of viability. Let me explain, based on what has been shown so far, it seems to be sensible to say that viability totally depends on the level of technological medical development specific to a certain area or a certain hospital. It is not possible, therefore, in my opinion, to make the determination of the moral status of the fetus coincide with a concept such as viability whose definition depends totally on some socially and historically determined characteristics.

2 The moral status of the fetus

2.1 Liberal position

As argued in the previous chapter, the question of the possible ethical consequences that the artificial uterus could assume at the social level is inevitably connected with the moral status of the fetus. Although my idea is to emphasize the importance of placing the woman at the center within the narrative on pregnancy and abortion, it is still necessary to address the question of the moral

⁹⁰ Edmonds, D. (Ed.). (2021). *Future Morality*. Oxford University Press.

status of the fetus. This debate generates a dichotomous division between pro-life and pro-choice positions, that is, between those who oppose the morality of abortion and those who support it. This division can also be understood more generally with a conservative or liberal stance towards abortion. I now take care of analyzing in detail the most important bioethical arguments in support of the two conceptions. The conservative position bases its theses on the following syllogism:

First premise: It is wrong to kill an innocent human being.

Second premise: From conception the embryo is an innocent human being.

Conclusion: It is wrong to kill an embryo or fetus⁹¹

As Peter Singer points out, logically, the syllogism is valid. If one claims that the fetus⁹² is a person, then one is obliged to support not only the absolute immorality of abortion, but also to consider it as a real murder. Consequently, the liberal thesis puts forward arguments aimed at denying the minor premise of the syllogism to get to show how the fetus can in no way be considered a person, showing, consequently, how the interruption of pregnancy within certain terms is morally licit⁹³. Several authors develop this type of demonstration in a more or less radical way. Michael Tooley argues in this sense that the fetus cannot be considered a person since it does not hold the fundamental requirement to have a serious moral right to life⁹⁴. The right to life in fact does not constitute the right to continue to exist by a mere biological entity. The right to life implies in a necessary way not only self-recognition by the biological entity as a real subject, but also the desire of the subject himself to continue to exist as such. In other words, in order to be recognized as a moral subject, that is, as a person, the fetus must have the concept of itself as the subject of a conscious life. Consequently, according to Tooley, even a newborn does not possess in this sense

⁹¹ Singer, P. (1996). *Rethinking life and death: The collapse of our traditional ethics*. Macmillan, p. 100.

⁹² For simplicity from this moment I will use the term "fetus" to also refer to the embryo.

⁹³ In this text I do not go into a sufficiently deep and exhaustive analysis of all the internal facets of the liberal position, I limit myself to exposing the most relevant theses and arguments to be able to underline the main critical issues.

⁹⁴ Tooley, M. (1972). Abortion and infanticide. *Philosophy & Public Affairs*, p. 49.

a serious moral right to life since he does not possess a concept of himself as a subject of conscious life. In this way Tooley's thesis fits into the context of the debate on abortion in a decidedly radical way, coming to morally justify not only late abortion, but also infanticide. Less extreme are the theses proposed by Maurizio Mori. His argument starts from a linguistic observation. Mori points out that the distinction between "human being" and "person" is highly relevant to the debate. In the West, the (natural) person is an entity that enjoys special protections and rights. This situation of "privilege" is justified by the fact that the person seems to have some very peculiar properties that it is difficult to explain analytically [...] In other words, the person seems to have characteristics such as to make us believe that, in some sense, he *transcends* the physical-organic nature by placing himself above the mere natural world⁹⁵. The discourse about the terminological difference is useful to underline how, although at conception the formation of a new human being⁹⁶ actually takes place, we cannot affirm, through the use of biological data, that the person is also formed. The correct use of scientific data underlines a fallacy in the argument that the fetus is a person from conception. What follows in the first hours after conception is a new biological system as it is equipped with a new chromosomal kit. This, however, is nothing more than a sequence of DNA covered with proteins. If one wants to continue to affirm the "transcendence" of the person, one must recognize that during the reproductive process important substantial changes take place because the seed is something merely material and radically different from the person. Nor does it seem plausible to believe that such a transformation occurs *immediately* upon fertilization when the new "biological system"⁹⁷ is formed. Through several gradual changes, what is initially mere matter evolves to become a person. That is why it seems senseless to consider abortion a murder, given that the person does not exist from the beginning. It is relevant, at this point in the argument, to define more precisely what is meant by the term person. According to Mori, any entity that possesses individuality and rationality is considered a person. From a scientific point of view, it is demonstrated that fertilization does not take place immediately when the sperm meets the egg, but

⁹⁵ Mori, M. (2008). Aborto e morale. Per capire un nuovo diritto., p. 40.

⁹⁶ "To be human" is used as "human life" meaning the life of organisms belonging to the species *Homo Sapiens*.

⁹⁷ Mori, M. (2008). Aborto e morale. Per capire un nuovo diritto. p. 46.

takes several hours. I do not dwell here to retrace the whole process of fertilization; it is however useful to emphasize, as from the moment in which the contact between the two gametes takes place, for a long time it is impossible to define the result of this union as an individuality. The cells created by fertilization are initially totipotent, that is, they possess the ability to transform themselves both into cells of the human body and into cells intended for the formation of the placenta. In addition, it must be remembered that, until about the fourteenth day, the embryo has the ability to twin, or there is the possibility that it is divided by creating two different fetuses. Therefore, it seems reasonable to conclude that, at least in the first two weeks, the embryo does not meet the characteristic of individuality required to be considered a person. The question of rationality raises more intricate questions than the possibility of establishing a precise and sure beginning of it. In this case Mori, like other liberals, supports the theory of the formation of the cerebral cortex. When the latter is fully developed, it is presumable that there is, even if not yet in place, the capacity for the exercise of rationality⁹⁸. Biological data seem to agree that the total development of the cerebral cortex does not occur before the third trimester. In this way, at least within these first months, the fetus does not even hold the second indispensable characteristic to be considered a person, namely rationality. In this regard, a criterion based on the development of brain activity creates a symmetry with the definition of death established by the Harvard Brain Death Committee⁹⁹. The foundation of liberal arguments is focused on demonstrating the moral status of the fetus to come to the conclusion that this cannot be considered a person. This type of argument, although it represents part of the foundations of the debate, today no longer seems to be able to exhaust it and above all to solve the great set of problems connected to it. The defense of abortion cannot be limited simply to the debate on the status of the fetus, leaving other relevant issues in the background, such as the role of women, access to practice or contraception. The experience gained in recent years clearly shows that the only result obtained by the liberal debate is the legalization of the practice through the birth of the various legislations. These events

⁹⁸ Mori, M. (2008). *Aborto e morale. Per capire un nuovo diritto*. P. 56.

⁹⁹ Fr. Singer, *Rethinking Life and Death*, p. 103; Cf. Hans-Martin Sass, *The Moral Significance of Brain-Life Criteria*, in F. K. Beller and R. F. Weir, *The Beginning of Human Life*, Kluwer Academic Publishers, Dordrecht, 1994, pp. 57-70.

underline how sometimes, even if there is a law that protects the practice, the interruption of pregnancy is not practiced in a sufficient and uniform way on the territory. This kind of difficulty can be caused by the decrease in the structures in which abortion is practiced, by the increase in the number of objecting doctors and, not least, by the stigmatization that still weighs on the woman who decides to end the pregnancy.

It is also crucial at this point to consider what the consequences that the artificial uterus could assume could be within this issue. It must be remembered that nowadays reproductive technologies, although existing, represent an option not always accessible to everyone. It would be unthinkable to argue that the artificial uterus would be an exception to this situation. Moreover, the existence of a technology like this, no longer used only for therapeutic purposes, but as a 'solution' or alternative option to abortion, would risk fueling the already present stigmatization of women who decide to voluntarily terminate their pregnancy. Therefore, in my opinion it is totally senseless to seek a solution to abortion because the solutions proposed so far would only contribute indirectly not to the elimination of the phenomenon of abortion, but would only help to increase the stigma and dangers related to the practice.

I maintain that all these problems, which are still strongly present today, cannot be solved by the use of the liberal paradigm alone. It is necessary to broaden the debate which, as it has been developed to date, neglects fundamental aspects related to abortion. The existence of a technology such as that of the artificial uterus cannot compromise the right to choice, which is in turn rooted in the right to reproductive freedom of every person. It is for these reasons that, in my opinion, the liberal debate defines an abstract normativity regarding abortion. Reducing the question to the ontology of the fetus alone abstracts from the concrete moral experience of the woman. The experiences and needs of the latter, but also the balance of forces inherent within society, are not integrated into the debate, thus making it insufficient in terms of liberalization and destigmatization of the practice.

2.2 Feminist position

The feminist position is placed from the beginning in defense of the free choice of the woman on her own body. "The uterus is mine and I manage it" says one of the most famous slogans that filled the European squares in the years of the pro-abortion feminist protest. An apparently strong ideal, that of autonomy, at the base of which there is the idea that, in order to finally reach a society free of gender inequalities, it is necessary for women to control sexuality and reproduction. It was 1971 when Judith Thomson published her famous article "A defense of abortion". The intent is

the same embodied by the liberal position, it is the methodology that changes. Thomson creates an ideal situation to show how abortion would still be morally acceptable even if the fetus were considered a person. The argument aims to shift the focus of the debate from the question of the moral status of the fetus to the experience of women.

One morning you wake up lying next to a violinist. [...] They kidnapped you, and the night before the violinist's circulatory system was connected to yours, so that your kidneys can purify his blood. The director of the hospital tells you: "Look we are sorry that they did this to you, we would never have allowed it if we had known. However, it has been done and there is no need to worry since it will only last for nine months. By then he will be healed and you can detach yourself without problems."¹⁰⁰

In this case, what would the person who, without his will, wake up connected to the violinist be required to do? Is there a serious categorical duty on the part of the person in question not to detach himself from the violinist? The question could also be asked in the following terms: is there a serious categorical duty to be a good Samaritan towards one's neighbor? The example is useful since it is possible to replace the fetus to the violinist. Both have the right to life as persons, but to exercise it they need the use of a body of others. No legislation requires people to be good Samaritans. Although at all times there are people who need a donation of blood, organs or marrow to survive, no one is required to donate any of these things. Even if a close relative of mine needs any of the above things, is it my moral obligation to give them to him. This principle seems to apply incontrovertibly to everyone, except the woman who decides to terminate a pregnancy. This is the central idea behind Thomson's argument that the right to life implies the only negative duty not to kill and not the positive duty to help another live in case he cannot do it independently¹⁰¹. Of course, this argument, however strong and fundamental, is not enough. It was emphasized that the situation of the violinist can actually be equated with that of the fetus

¹⁰⁰ Thomson, J. J. (1976). A defense of abortion. In *Biomedical ethics and the law* (pp. 39-54). Springer, Boston, MA. P. 2.

¹⁰¹ Mori, M. (2008). Aborto e morale. Per capire un nuovo diritto. P. 68.

only in the case of a sexual assault suffered by the woman since, in all other cases, there is the awareness of being able to get pregnant despite the precautions taken in advance. This kind of criticism based on the responsibility of women given the awareness of the possible fallibility of contraceptive methods remains, in my opinion, very weak. Given the non-existence of a 100% safe contraceptive method, the only possible option to overcome the problem seems to be the total abstention of the woman from sexual intercourse except for explicit reproductive purposes. All this, in addition to being inappropriate for the purposes of my argument, also seems to me to be senseless. The excessive responsibility attributed to the woman in the case of pregnancy seems to overshadow the fact that procreation needs not only the woman, but also the man. This conception generates a sort of paradigm of guilt for which if the woman becomes pregnant involuntarily and decides to have an abortion she is first blamed because she is responsible because of the awareness of the act and then stigmatized because she decides to terminate the pregnancy and therefore the life that would derive from it. Susan Sherwin, one of the leading exponents of feminist bioethics, problematizes this position in an interesting way. It explains how those who are against abortion do not question all the issues and motivations that revolve around the woman's pregnancy. It can happen that the woman is the victim of rape and not just at the hands of a stranger. Violence can also occur at the hands of one's employer, partner or husband. Sexual intercourse in these cases is used as a means of submission and coercion although it may not be immediately recognized as such.

Women are educated to be complacent and accommodating, sensitive to the emotions of others, and frightened by physical power; men are educated to take advantage of every situation to start sexual intercourse and use sex as an expression of dominance and power. In light of these circumstances, it is difficult to argue that a woman can simply "choose" to avoid having sexual intercourse.¹⁰²

¹⁰² Sherwin, S. (1991). Abortion through a feminist ethics lens. *Dialogue: Canadian Philosophical Review/Revue Canadienne De Philosophie*, 30(3), 327-342.

It is also not possible for the woman to completely rely on the use of contraceptive. Consider how contraceptive methods, even if they can be considered luxury goods because of their cost, in many countries¹⁰³ are not provided to women either free of charge or through facilities of any kind. In addition, as previously mentioned, to date there is no 100% safe method of contraception. The safest is the use of a barrier method used together with a spermicide. Excluding the above-mentioned cost discourse, the latter method may still be difficult for a woman, especially if she is young, to apply. Sexual health information about early intercourse is still insufficient, and young women are often not encouraged to inquire about how sexual intercourse actually takes place in a non-stereotyped way. Moreover, it is necessary to take into account all men who explicitly or not explicitly¹⁰⁴ require their partner not to use an a barrier method of contraception. Reconnecting with the liberal debate, Sherwin also returns to talk about the fetus. Given the relationship that is formed during pregnancy, the fetus has a moral value, but the latter is only relational and not absolute. In this way it is argued that it is impossible to attribute to the fetus a value according to an abstract metaphysical criterion of person¹⁰⁵. In this perspective, the value of the fetus varies depending on the value that the woman decides to attribute to it. In this way, Sherwin is completely connected to a specific feminist landscape that seems to want to defend abortion simply by giving the woman an abstract generative power that would allow her to establish what is entitled or not to continue its development. Although I consider, in general, Sherwin's arguments to be of central importance, I also believe that today the latter thesis is weak and insufficient. As Laura Palazzani argues, "relationship is a dimension of subjectivity, but it does not constitute it in an original way. If we talk about recognition, it means that the value is already there"¹⁰⁶. Supporting the criticism of liberal principles is Sally Markowitz, who observes that the liberal position, through the use of

¹⁰³ The case is that of countries such as Italy and Spain. Cf. European Parliamentary Forum on Population and Development, *Tracking access to modern contraception across Europe*, 2017.

¹⁰⁴ This is the case of the *stealthbing*, a practice in which the man takes off the condom without the partner's knowledge. This practice is now considered illegal in Great Britain and sexual harassment in Switzerland. Cf. A. Brodsky *Rape-adjacent": imagining legal responses to non-consensual condom removal*, *Columbia Journal of Gender and Law*, Vol. 32, No. 2, 2017, pp. 183-210.

¹⁰⁵ Sherwin, S. (1991). Abortion through a feminist ethics lens. *Dialogue: Canadian Philosophical Review/Revue Canadienne De Philosophie*, 30(3), p. 334.

¹⁰⁶ Palazzani, L. (2008), *Abortion in feminist and female thought*, *Studia Bioethica*, Vol. 1, No. 2, p. 163.

the concept of *privacy*, discusses social problems such as abortion without making any mention of gender issues¹⁰⁷. The concept of autonomy does no better. It deals with ensuring the well-being of the individual without any specific reference to the status of women within a society based on gender inequality. Autonomy and *privacy* are *gender-neutral* rights, which belong indiscriminately to all citizens and seem to ignore the gender differences present within society. Catharine MacKinnon defines the concept of privacy in these terms:

The problem is that while the private represents a refuge for some, it is for others a hell, often at the same time. In gender light, privacy represents a sphere of sanctified isolation, impunity, and irresponsibility. It surrounds the individual in his habitat. It belongs to the individual who has the power. Women have been granted neither individuality nor power. Everyone is implicitly the same in there. If the woman needs something - let's say, equality - to make these assumptions real, the privacy law does nothing for her, and also ideologically undermines the state intervention that could provide the conditions for its significant exercise.¹⁰⁸

The liberal paradigm seems to reduce the set of social problems that are inexorably linked to women and reproduction by binding them to a merely private sphere and not of public interest, sometimes feeding the set of economic and social inequalities. Privacy allows the individual woman to terminate the pregnancy, but it certainly does not solve all the problems that are upstream. Reducing the issue of abortion solely to the recognition of the individual freedom of women leads to a de-accountability of both the state and the civil community. Free and equitable access to abortion must remain a public responsibility¹⁰⁹, although the choice remains bound to the decision of the individual woman. A model based on the autonomy of control over her own body by the woman, or merely on her *privacy*, is inadequate in the same way that a debate focused only on the moral status of the fetus is inadequate. I agree with Markowitz that we need to find new arguments

¹⁰⁷ .Markowitz, S. (1990). Abortion and feminism. *Social Theory and Practice*, 16(1), PP. 2-3.

¹⁰⁸ MacKinnon, C. A. (1991). Reflections on sex equality under law. *Yale Law Journal*, P. 1311.

¹⁰⁹ Jaggar, A. M. (1997). Regendering the US abortion debate. *Journal of social philosophy*, 28(1), P. 133.

that can both reflect the awareness of women's oppression and help resolve it. The aim is always to show how there is a correlation between reproductive freedom and the oppression of women within society.¹¹⁰

3. A political reformulation of the debate

The question, reduced to a minimum, always remains that of establishing under what conditions abortion is morally correct or incorrect. The point is that defining this thing in an incontrovertible way seems to be extremely complex since both the concepts of viability and moral status depend in turn on characteristics and situations that are sometimes completely arbitrary.

This should show how the issue of abortion and consequently the development of the artificial uterus need to be rooted not only on these two concepts but, mainly, on a public and social debate. As explained repeatedly in the course of this text, the artificial uterus represents an extremely relevant technological advancement within not only the medical field and scientific research, but also from the point of view of reproductive ethics. The latter would in fact represent a very important tool in the hands of doctors to allow to successfully carry out a large number of pregnancies – desired – that for problems related to or the development of the fetus, but also to health problems of the mother is forced to interrupt.

At the same time, however, the broad debate that has arisen around the possibility that this tool could put an end to the moral justification of abortion must serve as a warning, not only for the feminist debate, for the possible negative consequences that this could entail. Since research on the artificial uterus is developing in recent years, it is necessary to open a debate that can detect not only its potential, but also its limitations.

Quoting Horn again, how social scientists frame these concerns, and how we pursue redressing them, is of vital significance to the impact of this technology.¹¹¹

¹¹⁰ Markowitz, S. (1990). Abortion and feminism. *Social Theory and Practice*, 16(1), P. 4.

¹¹¹ Horn, C. (2022). Ectogenesis, inequality, and coercion: a reproductive justice-informed analysis of the impact of artificial wombs. *BioSocieties*.

At this point it is necessary to 'put the pieces together' to realize how in light of the continuous limitations that are imposed on women in their reproductive freedom, the artificial uterus, if not accompanied by a solid battle for the defense of rights, could represent a serious threat. In fact, what I want to emphasize, which is the fulcrum of this thesis, is the extreme importance of determining and situating from the historical and social point of view the great changes and discoveries made in the scientific field.

There are many examples that could be given to demonstrate the fact that, sometimes, new technological discoveries have led to more or less problematic consequences in the ethical field.

It could be mentioned that the continuous developments and improvements in the field of fetal ultrasound have helped to root the idea that the fetus, from the very first weeks, is considered a person¹¹². Of course, the possibility of collecting and having increasingly quality images from the very first weeks of pregnancy allows to detect in a timely manner some problems that, if not resolved, could lead the fetus to have irreversible physical and health consequences. At the same time, however, early fetal imaging helps to create an extremely anthropomorphized view of the fetus that, if born in the very first months of gestation, would not be able to survive. But the fact of being able to see and observe the humans' faces, limbs, etc. may lead viewers to perceive them as "more human" than previously thought—and thus more natural objects of empathy and possible attachment. Second, the effect of the images on viewers' ethical judgments may be mediated by (or perhaps dispel) various cognitive and empathic biases.¹¹³ I would like to stress once again that this is not a valid argument to argue that technologies of this kind are 'dangerous' for women's rights and for the voluntary termination of pregnancy in general. The aim is always to emphasize the need for a critical and social evaluation when a new technology is inserted into the medical landscape because, inevitably, this will result in consequences from a social point of view.

So, what should be the task and purpose of a feminist bioethical debate in this case? Should we

¹¹² Giebel, H. M. (2020). Ultrasound Viewers' Attribution of Moral Status to Fetal Humans: A Case for Presumptive Rationality. *Diametros*, 17(64), 22-35.

¹¹³ Ivi, p. 25.

feel satisfied with imposing restrictions that protect our rights? Most of the feminist voices that have recently spoken on this issue say no and I totally share their position¹¹⁴. We have to go further than pushing to regulate for 'positive' uses of artificial wombs (improving care in reproduction) and against negative ones (coercive uses and/or increasing stratification). The bigger question here is for what purpose, and for whom, reproductive technologies should be created¹¹⁵.

It is necessary that at this moment apolitical and situated debate be developed that is able to bring back and relocate reproductive technologies not only at the academic level in the field of bioethics, but also and above all at the practical level from the feminist political point of view.

Conclusions

It is estimated that within five years it will finally be possible to test the artificial uterus through clinical trials using human fetuses and no longer just animals.

Consequently, this is the right time to deepen the debate about the possible ethical and social consequences that the artificial uterus and the ectogestation could generate.

Through this thesis I have tried to bring this question to light and underline its importance especially in the light of recent events and the continuous limitations that the right to voluntary interruption of pregnancy is undergoing in the world.

I have tried to show how it is necessary to recognize the neutrality of new technologies in medical and reproductive clothing and, at the same time, to highlight the possible negative implications that these could assume if inserted within a problematic and discriminatory context.

The risk could be to make a technology of this type, created and developed with the sole therapeutic intent within the neonatal therapies, a tool of coercion and limitation for the freedom of choice of women.

¹¹⁴ Romanis, E. C. (2020). Partial ectogenesis: freedom, equality and political perspective. *Journal of Medical Ethics*, 46(2), 89-90.

¹¹⁵ Chloe Romanis, E., & Horn, C. (2020). Artificial wombs and the ectogenesis conversation: A misplaced focus? Technology, abortion, and reproductive freedom. *IJFAB: International Journal of Feminist Approaches to Bioethics*, 13(2), 174-194.

In this regard, I have tried to refute one of the main, and most risky, arguments, namely the idea that the artificial uterus, by moving pregnancy outside the mother's uterus, would be able to put an end to the phenomenon of abortion.

I showed how, adhering to this kind of vision, it is possible to counter by showing how there is a real moral right on the part of the people involved in pregnancy not to want to be parents neither biological nor social. However, this is not enough. It is not enough for arguments of this kind to show that there is in an essential way a general misunderstanding of the right to abortion.

Considering pregnancy – and its narration – as a question solely focused on the fetus and the place of its development contributes to feeding a vision not only discriminating of the woman, but also to reducing it to a mere incubator whose primary purpose is that of physical and social reproduction. Consequently, thinking of solving the issue of abortion by 'moving' the place of development of the fetus further demonstrates how it is necessary to return to talking about abortion and the motivations related to justice and reproductive ethics that accompany this choice. At the same time, focusing political attention on this new instrument may give us the opportunity not to return to a thorough discussion of reproductive rights. Since the right to voluntary termination of pregnancy is not a matter that needs to be resolved, but it is a right that requires to be defended.

Bibliography

- Appleby, J. B., & Bredenoord, A. L. (2018). Should the 14-day rule for embryo research become the 28-day rule?. *EMBO molecular medicine*, 10(9), e9437.
- Bertoli, P., Grembi, V., Hesse, C. L., & Castelló, J. V. (2020). The effect of budget cuts on C-section rates and birth outcomes: Evidence from Spain. *Social Science & Medicine*, 265, 113419.
- Blackshaw, B. P., & Rodger, D. (2019). Ectogenesis and the case against the right to the death of the foetus. *Bioethics*, 33(1), 76-81.
- Bobei, TI, Haj Hamoud, B., Sima, RM, Gorecki, GP, Poenaru, MO, Oлару, OG, & Ples, L. (2022). The Impact of SARS-CoV-2 Infection on Premature Birth—Our Experience as COVID Center. *Medicina*, 58(5), 587.
- Bonito, V. 2019. Multimillion grant brings artificial womb one step closer. Eindhoven University of Technology, October 8; <https://bit.ly/3fio37S>.
- Cannold, L. (1995). Women, ectogenesis and ethical theory. *Journal of applied philosophy*, 12(1), 55-64.
- Chloe Romanis, E., & Horn, C. (2020). Artificial wombs and the ectogenesis conversation: A misplaced focus? Technology, abortion, and reproductive freedom. *IJFAB: International Journal of Feminist Approaches to Bioethics*, 13(2), 174-194.
- Di Simone, V. (2014). Il dibattito attorno all'ectogenesi: un'analisi quantitativa e qualitativa degli auspici e timori della comunità scientifica. *Revista de Direito Econômico e Socioambiental*, 5(1), 19-52.
- Di Stefano, L., Mills, C., Watkins, A., & Wilkinson, D. (2020). Ectogestation ethics: The implications of artificially extending gestation for viability, newborn resuscitation and abortion. *Bioethics*, 34(4), 371-384.
- Di Stefano, L., Mills, C., Watkins, A., & Wilkinson, D. (2020). Ectogestation ethics: The implications of artificially extending gestation for viability, newborn resuscitation and abortion. *Bioethics*, 34(4), 371-384.
- Edmonds, D. (Ed.). (2021). *Future Morality*. Oxford University Press.
- Elder, K., & Dale, B. (2020). In-vitro fertilization.
- Engelhardt Jr, H. T. (1996). *The foundations of bioethics*. Oxford University Press.
- Firestone, S. (2015). *The dialectic of sex: The case for feminist revolution*. Verso Books.
- Fishel, S. (2018). First in vitro fertilization baby—this is how it happened. *Fertility and sterility*, 110(1), 5-11.
- Giebel, H. M. (2020). Ultrasound Viewers' Attribution of Moral Status to Fetal Humans: A Case for Presumptive Rationality. *Diametros*, 17(64), 22-35.
- Haldane, Charlotte. 1926. *Man's World*. London: Chatto and Windu.
- Haldane, J.B.S. 1923. "Daedalus, or, Science and the Future." In *Heretics*, Cambridge, 1–23. <https://www.marxists.org/archive/haldane/works/1920s/daedalus>

- Held, V. (1995). *Justice and care: Essential readings in feminist ethics*. Routledge.
- Horn, C. (2020). Ectogenesis is for Feminists: Reclaiming Artificial Wombs from Antiabortion Discourse. *Catalyst: Feminism, Theory, Technoscience*, 6(1).
- Hornick, M. A., Davey, M. G., Partridge, E. A., Mejaddam, A. Y., McGovern, P. E., Olive, A. M., ... & Flake, A. W. (2018). Umbilical cannulation optimizes circuit flows in premature lambs supported by the EXTra-uterine Environment for Neonatal Development (EXTEND). *The Journal of Physiology*, 596(9), 1575-1585.
- Hughes, J. (2021). Artificial womb: a short history. *Orbis Idearum*, 9(2).
- Jaggard, A. M. (1997). Regendering the US abortion debate. *Journal of social philosophy*, 28(1), 127-140.
- Kaczor, C. (2005). Could artificial wombs end the abortion debate?. *The Edge of Life: Human Dignity and Contemporary Bioethics*, 105-121.
- Kirane, A. G., Gaikwad, N. B., Bhingare, P. E., & Mule, V. D. (2015). "Informed" consent: an audit of informed consent of cesarean section evaluating patient education and awareness. *The Journal of Obstetrics and Gynecology of India*, 65(6), 382-385.
- Langford, S. (2008, July). An end to abortion? A feminist critique of the 'ectogenetic solution' to abortion. In *Women's Studies International Forum* (Vol. 31, No. 4, pp. 263-269). Pergamon.
- Little, M. O. (1996). Why a feminist approach to bioethics?. *Kennedy Institute of Ethics Journal*, 6, 1-18.
- Lukasse, M., Schroll, A. M., Karro, H., Schei, B., Steingrimsdottir, T., Van Parys, A. S., ... & Bidens Study Group. (2015). Prevalence of experienced abuse in healthcare and associated obstetric characteristics in six European countries. *Acta obstetrica et gynecologica Scandinavica*, 94(5), 508-517.
- MacKinnon, C. A. (1991). Reflections on sex equality under law. *Yale Law Journal*, 1281-1328.
- March of Dimes. (2021). March of dimes 2021 report card reveals slight drop in preterm birth rate. <https://www.marchofdimes.org/news/march-of-dimes-2021-report-card.aspx#:~:text=March%20of%20Dimes%2C%20the%20nation's,nation%20keeping%20it's%20C%2D%20grade.>
- Markowitz, S. (1990). Abortion and feminism. *Social Theory and Practice*, 16(1), 1-17.
- Mathison, E., & Davis, J. (2017). Is there a right to the death of the foetus?. *Bioethics*, 31(4), 313-320.
- Mercurio, M. R. (2018). The EXTEND system for extrauterine support of extremely premature neonates: opportunity and caution. *Pediatric Research*, 84(6), 795-796.
- Miura, Y., Saito, M., Usuda, H., Woodward, E., Rittenschöber-Böhm, J., Kannan, P. S., ... & Kemp, M. W. (2015). Ex-vivo uterine environment (EVE) therapy induced limited fetal inflammation in a premature lamb model. *PLoS one*, 10(10), e0140701.
- MO Little, *Why a Feminist Approach to Bioethics ?*, Johns Hopkins University Press, Vol.6, No. 1, 1996, p. 1.

- Mori, M. (2008). Aborto e morale. Per capire un nuovo diritto.
- Palazzani, L. (2008), *Abortion in feminist and female thought*, Studia Bioethica, Vol. 1, No. 2.
- Partridge, E. A., Davey, M. G., Hornick, M. A., McGovern, P. E., Mejaddam, A. Y., Vrecenak, J. D., ... & Flake, A. W. (2017). An extra-uterine system to physiologically support the extreme premature lamb. *Nature communications*, 8(1), 1-16.
- Pera, M. F. (2017). Human embryo research and the 14-day rule. *Development*, 144(11), 1923-1925.
- Prasad, Aarthi. 2017. "How Artificial Wombs Will Change Gender, Family and Equality." *The Guardian*, May 1, 2017
- Räsänen, J. (2017). Ectogenesis, abortion and a right to the death of the fetus. *Bioethics*, 31(9), 697-702.
- Räsänen, J., & Smajdor, A. (2020). The ethics of ectogenesis. *Bioethics*, 34(4).
- Rodger, D. (2021). Why ectogestation is unlikely to transform the abortion debate: a discussion of 'Ectogestation and the Problem of Abortion'. *Philosophy & Technology*, 34(4), 1929-1935.
- Rodger, D. (2021). Why ectogestation is unlikely to transform the abortion debate: a discussion of 'Ectogestation and the Problem of Abortion'. *Philosophy & Technology*, 34(4), 1929-1935.
- Romanis, E. C. (2020). Partial ectogenesis: freedom, equality and political perspective. *Journal of Medical Ethics*, 46(2), 89-90.
- Sherwin, S. (1991). Abortion through a feminist ethics lens. *Dialogue: Canadian Philosophical Review/Revue Canadienne De Philosophie*, 30(3), 327-342.
- Sherwin, S. (1992). *No longer patient: Feminist ethics and health care*. Temple University Press. V. Held, *Feminist ethics. Transformations of Consciousness and the Post-Patriarchal Family*, p. 88.
- Sherwin, S. (2008). Whither bioethics? How feminism can help reorient bioethics. *IJFAB: International Journal of Feminist Approaches to Bioethics*, 1(1), 7-27.
- Simkulet, W. (2022). Ectogenesis and the Moral Status of the Fetus. *De Ethica*, 7(1), 3-18.
- Singer, P. (1996). *Rethinking life and death: The collapse of our traditional ethics*. Macmillan.
- Singer, P., & Wells, D. (1984). *The reproduction revolution: new ways of making babies*. Oxford University Press.
- Smajdor, A. (2007). The moral imperative for ectogenesis. *Cambridge Quarterly of Healthcare Ethics*, 16(3), 336-345.
- Solerte, M. L. (2020). Artificial uterus-research background to improve survival and outcome of extremely low birth weight newborns. *Journal of Gynecological Research and Obstetrics*, 6(3), 067-071.
- Stratman, C. M. (2021). Ectogestation and the problem of abortion. *Philosophy & Technology*, 34(4), 683-700.
- Stratman, C. M. (2021). Ectogestation and the problem of abortion. *Philosophy & Technology*, 34(4), 683-700.
- Stratman, C. M. (2021). Replies to Kaczor and Rodger. *Philosophy & Technology*, 34(4), 1941-1944.

Thomson, J. J. (1976). A defense of abortion. In *Biomedical ethics and the law* (pp. 39-54). Springer, Boston, MA.

Tooley, M. (1972). Abortion and infanticide. *Philosophy & Public Affairs*, 37-65

