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Ectogenesis Is For Feminists: Reclaiming Artificial Wombs from Anti-abortion Discourse

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Abstract

In this article, I call for interdisciplinary feminist research to reclaim the subject of artificial womb technology from anti-abortion discourse. In 2017, scientists announced the successful animal trials of a highly advanced incubator that replicates the conditions of the uterus and was used to gestate lamb fetuses from the equivalent of approximately 22–24 weeks human gestation through to term in good health. This technology, now being prepared for human trials, has generated a new wave of research on ectogenesis, the process of gestating a pregnancy outside the body. But while ectogenesis raises many pressing ethical concerns, the discourse has frequently reverted to one claim: that by allowing the fetus to be removed from the pregnant person's body without causing its death, ectogenesis will "solve" abortion. I argue that authors who make these claims fail to understand why feminists fight for abortion rights, take a narrow approach to reproductive freedom, neglect the social construction of "viability", and fail to acknowledge the dependency of the fetus on care. Finally, I identify areas for future feminist intervention.

Introduction

Recent developments in embryology and neonatology have drawn renewed scholarly attention to ectogenesis: the process of gestation occurring outside the body. In 2016 scientists in the United States and England cultivated embryos in culture up to thirteen days, ending this experiment only due to the contemporary

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legal limit of fourteen days (Shabazi et al., 2016). While it had long been assumed that embryos needed to implant in the uterus after seven days in order to grow, these studies demonstrated that embryos are capable of self-organizing without maternal input in the very early stages of development.

In 2017 a research team based at Children's Hospital of Philadelphia announced the success of an advanced incubation technology called "the biobag," in which premature lamb fetuses were gestated from the equivalent of twenty-two to twenty-four weeks in a human through to term (Partridge et al., 2017). Later that year researchers collaborating across the University of Western Australia and Tohoku University in Japan reported promising results in animal trials using a similar model (Usuda et al, 2017). Both research teams have since run additional trials (Hornick et al., 2019; Usuda et al., 2019), and as of October 2019, a group based at Máxima Medical Center and the Eindhoven University of Technology in the Netherlands has received substantial funding to develop a prototype artificial womb building on earlier studies. While there are variations in each group's design, the unique intervention made by these researchers is to treat "extremely preterm infants…as fetuses, rather than as small babies" (Usuda et al., 2019, p. 69. e22). Most innovative here is that rather than simply acting as emergency life support, this treatment will allow the fetus to continue to develop outside of the pregnant person's body (Romanis, 2019).[1] A closed system, the technology replicates the environment of the womb by suspending the fetus in artificial amniotic fluid. An oxygenator circuit, connected via catheters that mimic the umbilical cord, allows for nutrients and oxygen to enter and for waste to be pumped out, propelled by the fetus's own heartbeat. Attention has also been paid to facilitating less tangible elements of gestation, with the biobag researchers including "a darkfield camera allowing real-time visualization of the fetus within its darkened environment and the ability to play maternal heart and abdominal sounds to the fetus" (Partridge et al., 2017, p.9). A new wave of research that takes up the ethical implications of artificial wombs has followed in the wake of these breakthroughs. Scholars have argued that the gap between growing embryos in culture and sustaining preterm fetuses will one day close, resulting in full ectogenesis.

Though the intention of researchers who work on advanced incubation technology is to improve health outcomes for preterm babies, scholarly engagement has frequently returned to one claim: that artificial wombs foretell the "end" of abortion. Often presented as novel, this thought experiment first emerged after the United States Supreme Court's landmark *Roe v. Wade* decision

in 1973. The court ruled that forcing a woman to remain pregnant against her will was a violation of her right to privacy. It further held that states had competing interests in upholding this privacy right and in the life of the fetus throughout pregnancy, with the latter interest increasing as the fetus developed. Legal and bioethical scholars (Abel, 1974; Favole, 1979; Goldstein, 1978) argued that artificial wombs would allow both interests to be satisfied. Privacy rights could be upheld by extracting the unwanted fetus from the woman's body (thus ending her pregnancy), and interest in fetal life could be protected by implanting it to grow through ectogenesis instead of being terminated.

Blackshaw and Rodger (2019), Mathison and Davis (2017), and Kaczor (2018), among others, have rekindled this claim, responding to the biobag breakthrough with articles titled in variations of "Is There a Right to the Death of the Foetus?," and broadly concluding that pregnant people would be morally compelled to use an artificial womb rather than seeking termination. Media coverage has been similarly directed, with the *New York Times* leading lesser-known newspapers in publishing opinion pieces such as "The Abortion Debate Is Stuck: Are Artificial Wombs the Answer?" (Istvan, 2019). These proposals are particularly prolific in the United States, where Donald Trump's governance has reinvigorated state-level efforts (successful thus far in Georgia and Alabama) to pass near-total abortion bans, and where legal, structural, and social barriers remain in place (including the federal Hyde Amendment),[2] which have long made it extremely difficult for people from low-income communities, Indigenous women, women of color, new immigrants, and LGBTQ people to secure abortion care in practice.

Partially ectogenetic technologies currently in development have important implications for the survival of premature babies and the health of pregnant people who face complications late in term. As I argue elsewhere (Romanis & Horn, in press), given extreme disparities in maternal morbidity and mortality as well as preterm birth both globally and within jurisdictions across racialized and classed lines,[3] artificial wombs raise pressing questions about distribution, design, and access. But the discourse needs to be reclaimed from the direction in which it is headed. Steered by the voices of conservative bioethicists and doctrinal legal scholars, discussion of ectogenesis frequently reverts to a focus on the morality of abortion. While I approach this issue as a critical legal scholar,[4] I argue that feminist analysis of the artificial womb should not be left to law alone. I will briefly make a case against claims that ectogenesis could "replace" abortion, and present a call for feminist-led, intersectional, and interdisciplinary research that explores the uses and ethics of this technology.

Reproductive Freedom Beyond Severance Theory

The authors of recent articles that proclaim that artificial wombs foretell the end of abortion rights (including Blackshaw & Rodger, 2019; Mathison & Davis, 2017), like their predecessors (Singer & Wells 2006; Kaczor 2005) return to moral philosopher Judith Jarvis Thomson's 1971 paper, "A Defense of Abortion." Thomson compared unwanted pregnancy to the experience of one's body being overtaken as a life support system for a famous violinist. She sought to show that even if we accept that the fetus has a right to life, this does not extend to a right to infringe on the body of another person. Blackshaw and Rodger (2019) write, "according to Thomson's reasoning, there is no right to the death of the foetus, and so if ectogenesis is available, we are morally obliged to utilize it for unwanted pregnancies rather than aborting the foetus" (p. 78). Similarly, Mathison and Davis (2017) proclaim that according to the logic of "pro-choice advocates," a pregnant person has only a protected right to bodily autonomy, and once the fetus can be severed from her body without killing it, she will have no right to its death. These claims neglect the strategic nature of Thomson's reasoning. Writing in 1971, Thomson spoke from a context in which abortion was illegal in her home nation of the United States, in which a bare majority in support of reproductive rights had not been won. Between 1971 and 2019, decades of ethical, philosophical, and legal debate over abortion have transpired.

So too has the technology of abortion changed since 1971. While dilation and curettage (a minor surgical procedure) was standard practice in the 1970s, since the mid-2000s the majority of abortions involve the ingestion of two pills (Sheldon, 2016). The argument that extracting a fetus to an artificial womb would provide an alternative to termination that would preserve both the life of the fetus and the pregnant person's bodily autonomy is hopelessly anachronistic. The consumption of two pills is not analogous to a procedure designed to remove a fetus intact without causing it harm. The biobag currently in development is intended for use with fetuses from twenty-two to twenty-four weeks gestation. There is a clear contrast between ingesting abortifacients in the early stages of pregnancy and being made to carry a fetus for twenty-two weeks until it could survive in an artificial womb, whereupon it would need to be removed via surgical procedure or induced delivery (Alghrani, 2008). Yet, even if removing a fetus to an artificial womb could one day be made physically equivalent to consuming a pill, it is grossly reductive to imagine that feminists would accept artificial wombs as a forced alternative to abortion. Strategies within feminism(s) for protecting reproductive care, including abortion, have never been a monolith, and feminist

discourse as to why abortion must be protected is not reducible to choice-based justifications focused solely on protecting a right to end a pregnancy.

The reproductive justice movement, founded by Black feminist grassroots activists in the US, was formulated precisely in response to the limitations of the strategies employed by the mainstream movement for reproductive rights. In taking a narrow focus in pursuit of a legal right to end a pregnancy, concessions were continually made when it came to protecting positive rights to access abortion and other forms of reproductive care, leaving many women of color and low-income women without the means to exercise this "choice" in practice. Reproductive justice organizers identified that for African American, Latina, and Indigenous women, for people with disabilities, and for working-class communities, freedom from sterilization abuse and reproductive coercion, access to healthcare and support throughout pregnancy, and freedom from environmental harms, structural discrimination, and violence, were frequently more pressing than protecting a narrow legal right to end a pregnancy. As Ross et al. (2017) emphasize, "the right not to have children using safe birth control, abortion, or abstinence; the right to have children under the conditions we choose, and the right to parent the children we have in safe and healthy environments" (p. 14) are the holistic aims of reproductive justice. Abortion rights remain vital here, but they are "contextuali[zed] within a larger matrix of oppression" (Ross et al., 2017, p. 15). Beyond fighting for a legal right to choice, then, strategizing for abortion rights that is informed by a reproductive justice framework mobilizes human rights discourse to "treat abortion and other reproductive health services as akin to the resources all human beings are entitled to—such as health care, education, housing, and food" (Roberts, 2015).

Critical and relational feminist legal theorists, too, articulate the need for abortion beyond a right to end a pregnancy. In the jurisdictions of the United Kingdom in which the Abortion Act 1967 is in effect, coverage under the National Health Service and broad support from the medical community mean that access to reproductive health services are widely more available than in the US. Yet the Abortion Act 1967 retains abortion as a criminal offense with exceptions, requiring two physicians to agree that a pregnant person meets one of these exceptions in order to secure the procedure. As Sheldon (1997, 2016) has emphasized, understanding abortion through a feminist lens means affirming abortion as healthcare, and rejecting its criminalization and the paternalistic assumption that a person's reasons for seeking abortion require outside justification. Kaposy and Downie (2009) argue within the context of Canada (where despite the absence of

criminal law regulating abortion and the presence of universal healthcare, significant barriers to access remain) abortion must be articulated within the pursuit of a comprehensive campaign for access to safe and local reproductive care, proceeding with a "relational conception of autonomy" that understands "the exercise of reproductive choice within an environment of positive and negative interpersonal, institutional, and social forces" (p. 99).

These examples are, of course, not at all exhaustive. But my aim here is to show that reducing the justification for abortion to a singular liberal feminist articulation of reproductive rights dismisses the ways that feminisms have articulated reproductive freedom beyond severance theory. On this point, I want to turn to the problems of how "autonomy" is understood in claims that ectogenesis will end the need for abortion.

Autonomy Remains Implicated

Disentangled from a justification of abortion rooted solely in a right to end a pregnancy, arguments that extracting the fetus into an artificial womb could still satisfy the pregnant person's bodily autonomy crumble. Ross et al. (2017) argue that beyond the "right to make personal decisions about one's life," a robust protection to autonomy would entail "the obligation of government and society to ensure that the conditions are suitable for implementing one's decisions" (p. 14). Bodily autonomy is essential, but on its own it is insufficient. Given the likely cost of creating and operating artificial womb technology, if introduced into the contemporary United States, the requirement that pregnant people end unwanted pregnancies by undergoing a fetal extraction would not only fail to protect reproductive freedom by inhibiting people from ending unplanned pregnancies on their own terms. It would also continue the ongoing criminalization of the many pregnant people (disproportionately, low-income women of color) who are already unable to access reproductive care within legal means.

Autonomy can only be enacted if it is enabled by a relational framework of positive resources that would allow a person to end or to carry on with a pregnancy, and to be provided with resources for support in either instance. As Jackson (2000) writes, the autonomy sought in the abortion decision is not just "a right to be free from unwanted intrusion, but…the idea that individuals should be able to pursue their own goals according to their own values, beliefs, and desires" (p. 469). A robust, feminist understanding of autonomy in abortion, then, rejects the "solution" of ectogenesis, which in no way protects the enabling resources

with which to make decisions according to one's own "values, beliefs, and desires" (Jackson, 2000, p. 469). In framings of artificial wombs as an alternative to abortion, a requirement that pregnant people have fetuses extracted to an artificial womb instead of *being* terminated could one day redress the physical burden of unwanted pregnancy, but where it was presented as the only option, it could never protect autonomy.

Fetal Viability Is a Legal Fiction

Key to the argument that abortion after ectogenesis will no longer be permissible is the understanding that artificial womb technology will slowly lower the point at which a fetus can be considered "viable." In medicine, "viability" is the point at which, taking account of the fetus's gestational age and weight among other factors, a fetus is judged to have a chance of survival outside the womb. In some nations (including the US and England, Scotland, and Wales), viability has been translated into law as the point at which abortion can be more heavily regulated or banned, due to the perception that this is the stage at which the fetus need no longer infringe on the pregnant person's body in order to live.

The artificial womb technology currently in development could lower medical viability from approximately twenty-four to twenty-six weeks to twenty-three weeks (Partridge et al., 2017). Some scholars propose that this point could be slowly reduced over time, eventually meaning that abortion at any stage of pregnancy would be "killing a viable human being possessing some moral status" (Blackshaw & Rodger, 2019, p.78). In jurisdictions where the law uses a gestational limit to mark the point at which abortion is a criminal offense, or where it is extremely difficult to secure an abortion after this point, it is true that the technology could pose a challenge, or rather, that it could further the ends of the long-pursued campaign for fetal personhood that has already resulted in the criminalization of low-income pregnant people. In the US, the 1992 Supreme Court decision in *Planned Parenthood v. Casey* affirmed viability as the point at which states could significantly restrict or ban abortion, regardless of whether technological advancement lowered this point over time. The construction of abortion rights as a continual balance between the pregnant person's privacy and fetal life has meant that significant structural, financial, and legal barriers have inhibited access and criminalized pregnant people for seeking abortion well prior to viability. But by suggesting that the inevitable consequence of a reduction in medical viability is a requisite reduction to abortion rights, legal scholars have presented viability as a self-evident determinative limit to reproductive rights. In so doing, they fail to acknowledge the socially contingent and fictive nature of

viability applied in law.

In jurisdictions such as Canada, in which abortion is decriminalized and there is no gestational limit at the federal level, artificial wombs are unlikely to challenge existing abortion jurisprudence. In Canadian law, the potential of the fetus to survive outside the womb has not been constructed as the limit to a pregnant person's right to bodily autonomy. Rather than accepting that with ectogenesis, abortion rights will be rightfully infringed upon, then, or proposing strategies to maintain the untenable status quo of abortion rights without resources, we should be focused on removing the false association of a perceived chance of fetal survival with a pregnant person's self-determination, and addressing continued inequities in access to safe and culturally appropriate resources in reproductive care across the life course. Petchesky (1987) asks, "what does it mean to speak of viability in a society that has no intention of providing care for the children of working mothers, much less aborted fetuses?" (p. 346). In other words, even if we accepted the version of events in which abortion was refused after ectogenesis, what exactly do these scholars anticipate will happen to the fetuses extracted from the wombs of pregnant people who do not wish to care for them?

The Fetus Remains Dependent

In the recurring claim that ectogenetic technology will end the need for abortion by allowing the fetus to be transferred into an artificial womb instead of being terminated, the relational entanglements that emerge from and around gestation frequently go unremarked. No provision is made for who will ultimately be responsible for the dependency of the fetus and the resulting infant decanted to an artificial womb. Failing to acknowledge that "regardless of where or by whom the fetus is gestated, it remains dependent upon someone" (Langford, 2008, p. 267), scholars belie their ignorance of the care, normally provided by a human, required to keep a fetus alive. As Lewis (2019) demonstrates, the extreme demands a fetus places upon a person's body make human pregnancy unique among animals. A distinction must be made here between gestation, which an artificial womb might one day be able to do in part or in full, and human pregnancy, which is a particular mammalian activity. Aristarkhova (2012), too, emphasizes that while an ectogenetic machine may facilitate gestation, human care will be required to allow it to run.

Some scholars do acknowledge that in the absence of the pregnant person, there will be a need to find a new caretaker for the fetus. Kaczor (2005) and Reiber (2010) each suggest that a woman who does not wish to continue her pregnancy

could transfer gestational responsibility to another progenitor by having the fetus extracted to an artificial womb. Yet these scholars do not address the way this alternative could produce a continued connection between the pregnant person and another progenitor with whom they may not wish to be in relation, or between this person and the fetus. Where scholars address these continued relations, they often do so through the language of shared property rights to the fetus held by the progenitors, or through referencing a right to avoid the purported harms of unwanted genetic relatedness (Räsänen, 2017; Schultz, 2010). These approaches reduce the relationships that may be produced through gestation to a singular contractual model tied to biological contribution, foreclosing the multiple possible relations that may emerge through gestation.

Also often neglected or considered only as an afterthought is the question of who will care for the ectogenetic fetus (and how this care may be funded) in instances in which both progenitors ultimately reject responsibility. Coleman (2004) and James (1987) discuss the distribution of responsibility for an ectogenetic fetus unwanted by both progenitors following its "birth," but each concludes that this scenario would be problematic primarily because it would result in a surplus of ectogenetic babies for adoption. This is certainly an important legal and ethical consideration. But equally pressing issues to address here are the question of the fetus's dependency on care while (and not simply after) it is gestating, and the inevitable and complex relationships produced between the fetus and caretakers, and between and amongst these caretakers as this ectogenetic gestation occurs. Finally, to return to Petchesky's (1987) query about viability, leaving the question of who will care for the ectogenetic fetus unanswered (and with this silence, implicating that providing resources to this end can be presumed as a social good) is an unacceptable outcome in a world in which "the children of working mothers" (p. 346), the children of migrants, of Black and Indigenous parents, are at best denied resources for care and at worst, targeted with violence.

A New Feminist Approach to Ectogenesis

Notably, feminist scholarship has uniformly held that state-mandated use of ectogenesis as an alternative to abortion would be self-evidently antifeminist (Jackson, 2008; Langford, 2008; Overall, 2015). But as conservative bioethicists and doctrinal legal scholars direct discourse on artificial womb technologies in the interest of anti-abortion sentiment, it is important not only that feminist scholars engage to redirect this discussion, but that this engagement rejects the tactic of reiterating a narrow focus on protecting or enhancing choice. When it comes to strategizing to protect abortion rights against a possible legal challenge posed by

ectogenesis, for instance, I argue that this means refusing legal strategies that already fail to sufficiently protect access to abortion in practice. While redefining viability in law to refer to an advanced stage of fetal development or the point at which the fetus can survive without medical intervention (Schultz, 2010; Steiger, 2010), or continuing to use a bodily-autonomy-based protection if the fetal extraction procedure remained invasive (Alghrani, 2008; James, 1987) hold strategic legal appeal, the energy of feminist legal scholars should be turned toward another strategy that would protect abortion rights against technological challenges: fighting for full decriminalization and free, safe, local, informed access.

Roberts (1999) writes that analyses that focus on the capacity of reproductive technologies to increase choice "for women" centralize a subject for whom access to healthcare and freedom from structural oppression are presumed stable. She argues that this tendency "operates like blinders that obscure issues of social power that determine the significance of reproductive freedom and control…not by ignoring them altogether, but by claiming to achieve individual freedom without the need to rectify social inequalities" (p. 298). Feminist considerations of artificial womb technology, then, must remain informed by analyses of social power and inequality. I also argue that they should be contextually specific. Partial artificial womb technologies like the biobag are currently being developed in the US, Australia, the Netherlands, and Japan, and present a number of areas of urgent inquiry: What specific issues related to cost, distribution of healthcare, and systemic inequality need to be considered in each of these locales? Given historical and ongoing sterilization abuses against Black women, Indigenous communities, people of color, people with disabilities, and queer and trans people, what contemporary laws, policies, and practices need to be addressed in specific jurisdictions to ensure coercive use of this technology would be prohibited? What materials are being used to design the artificial womb? Are they easily sourced? How much do they cost? Should the question of adaptability to different environments and/or future use by non-specialists be considered in its development? As Murphy (2012) writes, "the same bit of technology could—by being animated in different assemblages of technique, discourses, and subject positions—be meaningfully said to be two different things" (p. 152). In its current iteration, the artificial womb is set to be costly and limited to use in a medical setting. But in what other assemblages might the artificial womb be animated?

With the exception of a 1995 study by Cannold, in which she gathered small focus groups of women, and a 2009 study by Simonstein and Mashiach-Eizenberg,

there is very little scholarship that explores peoples' opinions of artificial womb technology and how it should be used. Attitudes toward the artificial womb will not be monolithic; expectations of what it could mean or do will be informed by racialized, gendered, and classed experiences of reproduction and reproductive technologies. Feminist intervention ensuring that diverse voices inform the direction of research and use are crucial.

As Cavaliere (2019) has argued, full ectogenesis might be engaged as a feminist political provocation: a demand for a future in which care labor is collectivized, and the health of pregnant people is taken seriously as a worthy social goal. Exploring these aims against the contemporary injustices that make them (productive?) imaginaries requires a refusal both of anti-abortion claims that would negate the use of artificial wombs to benefit pregnant people, and of a feminist engagement that would seek more choice "without the need to rectify social inequalities" (Roberts, 1999, p. 298). Unlike the partial artificial womb, full ectogenesis, as yet, remains speculative. To open it to possible feminist uses, we must disentangle the discourse from the limitations of the world as it is now, and redirect it toward the work to be done in seeking the other worlds that could be.

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Notes

[1] I use *pregnant person* and *pregnant people* because trans men, transmasculine, and non-binary people also need access to reproductive health services, including abortion, and must be included in conversations about the impact of artificial wombs.

[2] The Hyde Amendment bans the use of federal funds for abortion except in cases of rape or incest or where the pregnant person's life is at risk, effectively prohibiting people reliant on Medicaid from accessing funds for abortion care.

[3] For example, in both the United States and United Kingdom, rates of maternal morbidity and mortality remain significantly higher for Black women, even where studies have controlled for factors such as socioeconomic status (Smalls, Allen, & Brown, 2018; Novoa & Taylor 2018). Importantly, studies indicate that this

disparity is not primarily linked to unavailability of expert care or technology, but to discriminatory practices and to maternal stress exacerbated by structural racism.

[4] I draw on examples throughout from the United States, United Kingdom, where the Abortion Act 1967 is in effect, and Canada, as these are the jurisdictions with which my research is engaged

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