NAVIGATING THE LEGAL AND ETHICAL IMPLICATIONS OF ARTIFICIAL WOMB TECHNOLOGY

ANNA KETCHUM

ABSTRACT

Artificial Womb Technology (AWT) marks a profound turning point in the field of reproductive science, enabling the possibility of entirely extra-uterine fetal development. As this once-impossible technology shifts from speculative fiction to the medical realm, it raises important legal and ethical considerations. This paper considers how AWT challenges conventional notions of viability, legal personhood, parental rights, and reproductive autonomy in light of the Dobbs v. Jackson Women's Health Organization *decision in 2022. It examines the implications of redefining the point of viability to an earlier stage in gestation, the complexities of classifying ex utero fetuses within existing personhood frameworks, and the potential for AWT to reshape legal definitions of parenthood and bodily autonomy. This paper will also reflect on AWT's potential to intensify reproductive inequality, facilitate state coercion, and the commodification of reproduction, in the case that access and regulation are shaped by the market. Furthermore, this paper will contend that while AWT presents transformative ways of increasing reproductive freedom and diminishing gender inequality, it is also a technique that could exacerbate structural inequities in the absence of strong legal safeguards. Ultimately, this paper will argue for a regulatory structure that is both proactive and protective, combining the freedom of innovation with individual autonomy, fairness of access, freedom from coercive practices, and reimagining legal understandings of parenthood and personhood in the era of artificial gestation.*

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I. Background

The rapid development of Artificial Womb Technology ("AWT") represents a transformative shift in the field of reproductive medicine. AWT allows fetuses to develop in a controlled ex utero environment, replicating every aspect of each of the physiological processes that occur during a traditional pregnancy in a biological womb. Once an idea exclusive to science fiction, AWT is now approaching clinical reality as animal studies are yielding promising results, and researchers have actively begun to explore human applications. This technology confronts fundamental biological and cultural notions of pregnancy, gestation, and birth.

Historically, reproduction has been tightly bound to the maternal body. The womb has been both the biological and symbolic center of human development. AWT completely differentiates reproduction from the body, forming a spectrum of actions ranging from life-saving neonatal care all the way to full ectogenesis. As this transformation unfolds, it is more than just a technological advancement—it is a multifaceted innovation with extensive legal, societal, and ethical implications.[1] AWT will challenge our definitions of parenthood, fetal rights, autonomy, and reproductive choice, and require our legal systems to adapt as new realities emerge.

[1] Glenn I. Cohen, *Bioethics, Reproduction, and Extending Life*, Law and the 100 Year Life (Jan. 23, 2024), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4703196.

II. Viability and the Constitution

One of the most immediate and profound legal implications of AWT relates to fetal viability. Viability refers to the point at which a fetus can survive outside the womb.[2] The concept of viability has been the key threshold for balancing state interest with reproductive rights in American constitutional law. In *Roe v. Wade* (1973) (*"Roe"*), the court held that before fetal viability, the state had a limited power to interfere with a pregnant person's choice to end a pregnancy.[3] In *Planned Parenthood v. Casey* (1992) (*"Casey"*), this framework was reaffirmed, further emphasizing that states could not impose an "undue burden" on abortion access prior to viability.[4] Hence, these decisions made viability both a legal and scientific marker that occurred around 24 weeks of gestation.

Nevertheless, AWT could revolutionize this calculation by preserving fetal life significantly earlier than traditional neonatal care currently can. If AWT allows viability to shift from the current 24 to just 20 weeks, the states can attempt to protect fetal life at a much earlier stage of

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[2] Mary Chris Jaklevic, *What to Know About Fetal Viability — and Why Some Advocates Want It Out of Abortion Law*, Ass'n of Health Care Journalists (Oct. 16, 2023), https://healthjournalism.org/blog/2023/10/what-to-know-about-fetal-viability-and-why-some-advocates-want-it-out-of-abortion-law/.

[3] Roe v. Wade, 410 U.S. 113, 114 (1973).

[4] Planned Parenthood v. Casey, 505 U.S. 833, 834 (1992).

gestation, further restricting access to abortion. After *Dobbs v. Jackson Women's Health Organization* (2022) ("Dobbs"), which repelled *Roe* and *Casey*, states now have broad discretion to regulate abortion.[5] AWT can therefore be the basis of a ban on abortion altogether, under the argument that ex utero gestation is a non-lethal alternative.

Therefore, this development poses a significant setback for abortion rights and reproductive autonomy. The viability standard has never been solely about the survival of the fetus, but also served as an acknowledgment of the profound burdens that gestation imposes on the pregnant individual.[6] States that attempt to require fetal displacement to human-analogous gestation pods as an alternative to abortion may be in violation of the constitutional protections against the imposition of fetal bodies on their hosts. Although *Dobbs* eliminated federal protection for abortion, it did not directly overturn the wider doctrine of privacy and personal liberty anchored in the Fourteenth Amendment.[7] Thus, it is possible that the state may lack the constitutional authority to force an

[5] Dobbs v. Jackson Women's Health Organization, 597 U.S. 215, 1 (2022).
[6] Jessica H. Schultz, *Development of Ectogenesis: How Will Artificial Wombs Affect the Legal Status of a Fetus or Embryo?*, 84 CHI.-KENT L. REV. 877 (2010), https://scholarship.kentlaw.iit.edu/cklawreview/vol84/iss3/14/.
[7] U.S. CONST. amend. XIV.

individual to undergo a surgical operation or medical intervention to maintain fetal life—even one made technologically feasible due to AWT.

III. The Ex Utero Fetus and Legal Personhood

Another fundamental legal question that is raised by AWT is that of the definition of a person. In most jurisdictions, personhood is initiated at birth.[8] Born alive infants—those who have been gestated in the womb—are entitled to the same legal rights, protections, and recognition under the law as all other humans.[9] AWT introduces a scenario whereby the fetus can survive independent of the pregnant person, but was not born in a traditional way. In other words, an artificially gestated fetus occupies a liminal legal status — functionally viable, but not yet legally a person.[10]

How to treat or handle an ex utero fetus as compared to one developing in utero poses a complex legal issue. Harm to an artificially gestated fetus could be classified as a crime, a case of medical malpractice, or lead to the creation of a new category of legal wrong altogether. The Born-Alive Infants Protection Act (2002) ("BAIPA") grants full legal rights

[8] Andrew Crocker, *Are We Legally Ready for Artificial Wombs?*, FindLaw (March 21, 2019), https://www.findlaw.com/legalblogs/law-and-life/are-we-legally-ready-for-artificial-wombs/.
[9] Gonzales v. Carhart, 550 U.S. 124, 1 (2007).
[10] James E. Brown, *How Viable is Viability? Artificial Womb Technology and the Threat to Abortion Access*, 31 Mich. J. Gender & L. 1 (2024), https://repository.law.umich.edu/cgi/viewcontent.cgi?article=1313&context=mjgl.

to any infant "born alive" at any point in development, including those who survive attempted abortions.[11] Yet it is far from clear if the process of artificially extracting a fetus and putting it into an artificial womb constitutes a "birth" under the statute's current legal definition.[12]

That said, legal scholars have suggested a new categorization referred to as "fetonate", in order to classify artificially gestated fetuses that are continuing to grow outside of a human womb but have not been delivered in the traditional sense. If courts or legislatures were to adopt this classification, it would entail considerable changes to existing fetal protection laws.[13] For instance, the status of the "fetonate" may necessitate changes to existing laws about wrongful death, prenatal injury, or abortion.[14] These changes are not just semantic—they will decide whether hospitals, doctors, or even parents face legal liability for any harm done to artificially gestated fetuses.

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[11] Elizabeth Chloe Romanis, *Challenging the "Born Alive" Threshold: Fetal Surgery, Artificial Wombs, and the Limits of Legal Personhood*, 28 MED. L. REV. 93 (2020).
[12] *Id.*
[13] Felix R. De Bie et al., *Ethics Considerations Regarding Artificial Womb Technology for the Fetonate*, 5 AM. J. BIOETHICS 67 (2022).
[14] Bertha Alvarez Manninen, *A Critical Analysis of Dobbs v. Jackson Women's Health Organization and the Consequences of Fetal Personhood*, 32 Cambridge Q. Healthcare Ethics 357 (2023), https://doi.org/10.1017/S0963180122000809.

IV. Custodial Complexity and Parental Rights

AWT also calls into question the foundational bases of legal parenthood. Under the current system, both parental rights and obligations are set based on three important aspects of an individual's role in a child's life—their biological link to that child, their gestational link to that child, and their intent with respect to that child.[15] In surrogacy cases, courts have largely focused on intent, as the California Supreme Court found in *Johnson v. Calvert* (1993) (*"Johnson"*) when it ruled that the intended parents, not the gestational surrogate, were the legal parents.[16] The Uniform Parentage Act (UPA) further provides the process of determining legal parentage within cases of assisted reproduction.[17]

AWT challenges traditional boundaries that define parenthood. In cases where there is no human gestation, intent may be the primary legal standard. Throughout gestation, authority may be delegated to the genetic parents, medical professionals, or state-hired guardians. Custody disputes could arise in divorce cases or disagreement over whether to continue to

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[15] Elizabeth Chloe Romanis, *Abortion & 'Artificial Wombs': Would 'Artificial Womb' Technology Legally Empower Non-Gestating Genetic Progenitors to Participate in Decisions About How to Terminate Pregnancy in England and Wales?*, 8 J.L. & Biosciences (2021), https://academic.oup.com/jlb/article/8/1/lsab011/6279500.

[16] *Johnson v. Calvert*, 5 Cal. 4th 84, 93-94 (1993).

[17] Unif. Parentage Act § 101 (Unif. Law Comm'n 2017).

gestate, requiring courts to navigate uncharted legal problems in the absence of gestational precedent.

Furthermore, AWT may create a false sense of distance from pregnancy, persuading some people that they can "opt out" of parental obligations with greater ease. This would require that legal systems still assign financial or custodial responsibility according to genetics or pre-implantation agreements. As these complexities multiply, courts will face unprecedented decisions that current family law doctrines cannot yet sufficiently resolve.

V. Reproductive Freedom and State Coercive Power

Throughout the rapid development of AWT, one of the most urgent concerns is the use of AWT as an instrument of state control. While AWT could be used to expand reproductive possibilities, states could use its innovation and existence as a rationale for banning abortion.[18] In an extreme scenario, governments could require the extraction of the fetus and the artificial gestation of the fetus under the guise of protecting life. Historical precedents, such as the One-Child Policy in China, which involved forced abortions and reproductive surveillance, serve as an

[18] Cohen, *supra* note 1.

example that demonstrates how state interests can exploit reproductive technologies.[19]

Therefore, if AWT becomes viewed as the "less burdensome" option, people—especially populations that are marginalized—may be pressured and coerced into accepting artificial gestation. Without strong legal protections, AWT risks invading bodily autonomy and transferring decision-making power from people to institutions.

VI. Equity, Access, and Structural Inequity

While AWT offers clear medical benefits and options—including improving outcomes for premature infants and widening parenthood for people who cannot carry a pregnancy—its availability may be scarce. As with most emerging medical technologies, AWT will likely emerge as an expensive option that is only available for those who can afford it. This could further exacerbate reproductive inequality as wealthy individuals will have access to safer alternatives while others will remain reliant on traditional birthing techniques that carry higher risks. In the absence of legal mandates, AWT threatens to establish a two-tiered reproductive

[19] Regulations on the Administration of Family Planning, art. 3 (State Council, 1981) (China).

system, where bodily gestation will disproportionately fall onto marginalized populations of people.

VII. Scope and Purpose Of This Article

This paper will examine how AWT challenges the fundamental pillars upon which reproductive law and bioethics rest. By blurring the lines of fetal viability, complicating the definition of legal personhood, and altering parental rights and reproductive autonomy, AWT leaves existing legal frameworks to reconsider and realign with these new realities.[20] This article will contend that whether AWT is used as an instrument of governance that advances empowerment or coercion will largely depend on how lawmakers, courts, and scholars interpret and regulate its use. In the following sections, I will deeply explore the legal and ethical implications of AWT—analyzing its convergence with abortion rights, family law, constitutional protections, and bioethical frameworks.[21] This analysis is ultimately aimed at laying the groundwork that balances both personal autonomy and technological innovation during this revolutionary technological shift.

[20] Romanis, *supra* note 15.
[21] Crocker, *supra* note 8.

VIII. Medical and Scientific Foundations of AWT

AWT has evolved after decades of research into neonatal medicine that sought to advance survival rates for extremely premature infants. One of the first and most notable cases is the 1996 Extrauterine Fetal Incubation (EUFI) experiment that laid the groundwork for our understanding of how to maintain gestation outside of the maternal body.[22] A significant advancement came in 2017, with the invention of the Biobag—a fluid-filled, extracorporeal environment that was able to sustain premature lamb fetuses for up to one month.[23] This device replicates the essential functions of the uterus, such as amniotic fluid replacement, targeted oxygenation, and nutrient transport across a synthetic placental interface.

AWT innovation soon led to the creation of the Ex-vivo Uterine Environment (EVE) platform in 2019, marking the second iteration of the technology with three important advances: improved gas exchange, biomimetic membranes that can continuously filter waste and balance electrolytes, and fetal heart rate monitoring.[24] These advances have made

[22] Elle Zhan Wei, *1996 – First Artificial Womb Experimented*, Next Nature Network (Aug. 2, 2017), https://nextnature.org/en/magazine/story/2017/1996-extrauterine-fetal-incubation.
[23] Emily A. Partridge et al., *An Extra-Uterine System to Physiologically Support the Extreme Premature Lamb*, Nat. Commun. 8, 15112 (2017).
[24] Haruo Usuda et al., *Successful Use of an Artificial Placenta–Based Life Support System To Treat Extremely Preterm Ovine Fetuses Compromised by Intrauterine Inflammation*, 223 Am. J. Obstet. Gynecol. 775 (2020), https://pubmed.ncbi.nlm.nih.gov/32380175/.

the introduction of partial ectogenesis—whereby AWT assists in the development of preterm infants—nearing close to clinical application. Yet, complete ectogenesis—meaning the full developmental process of a human embryo outside the human body through maternal output—is biologically and ethically unknown.

One of the main barriers to fully achieving ectogenesis at present primarily lies in the limitation of recreating the placental interface. In addition to its role in nutrient and oxygen transfer, the placenta regulates hormone production, immunological compatibility, and maternal-fetal signaling—functions that remain technically elusive. Furthermore, pulmonary development presents challenges as the transition from intrauterine liquid respiration to extrauterine air breathing has not yet been successfully recreated in an artificial domain.

Alongside these biomedical restrictions, AWT raises a variety of development and ethical issues. Gestation in an artificial environment cuts off the sensory, hormonal, and physiological flows that normally happen between mother and fetus throughout pregnancy. This raises concerns about the long-term impacts on neurodevelopment, immune function, and

psychosocial health.[25] However, the current lack of longitudinal human data prevents more definitive conclusions about these outcomes.

Nonetheless, this area of research continues to develop at a rapid pace. Trials with 3D-printed placental tissues, stem cell-derived umbilical structures, and microfluidic systems to emulate gas exchange are under development—indicating rapidly advancing sophistication of artificial gestational platforms.[26] If implemented successfully, AWT could revolutionize neonatal care and open up reproduction to people who are unable to carry a pregnancy. However, unless regulations are prioritized, the potential for commercialization, inequitable access, and coercive use will evolve to become a serious concern.[27]

Thus, the ethical and legal dimensions of AWT will need to be addressed in unison with its scientific development. Ensuing regulatory frameworks for AWT must prioritize equitable access, reproductive autonomy, and informed consent in order to ensure that AWT becomes a tool of empowerment, not of control.

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[25] Wei, *supra* note 22.
[26] Emma S. Gargus et al., *Engineered Reproductive Tissues*, Nat. Biomed. Eng. 4, 381–393 (2020).
[27] Claire Horn, *Abortion Rights After Artificial Wombs: Why Decriminalisation Is Needed Ahead of Ectogenesis*, 29 MED. L. REV. 80 (2021), https://pubmed.ncbi.nlm.nih.gov/34370037/.

IX. Personhood, Legal Definitions, and the Consequences of Artificial Womb Technology

Traditional legal definitions of personhood in the United States have long been anchored in birth, a moment in time when an individual is recognized to have full legal standing and protection under the Constitution.[28] This interpretation was further reinforced by *Roe* in 1973—when the Supreme Court ruled that the term "person" in the Fourteenth Amendment does not include the unborn.[29] According to *Casey*, viability is the critical threshold for fetal rights.[30] However, *Dobbs* overturned both *Roe* and *Casey*, removing the federal constitutional right to abortion and leaving the right to abortion access to each individual state.[31] This post-Dobbs legal landscape may conflict with the implications of AWT in ways that existing doctrines of personhood cannot adequately address.

AWT allows for fetal development to occur outside of the maternal body and thus disrupts the binary between fetal and neonatal life. An artificially gestated fetus may be viable but not "born" in the historically traditional way. States may perceive this technological advancement as a

[28] Crocker, *supra* note 8.
[29] *Roe*, 410 U.S. at 158.
[30] *Casey*, 505 U.S. at 836.
[31] *Dobbs*, 597 U.S. at 2.

rationale for restricting or eliminating abortion access as AWT expands the range of viability.[32] One might then say that termination would be unnecessary, as a fetus could simply be transferred to an artificial womb. Such a claim raises profound constitutional questions. While *Dobbs* removed federal protections for abortion, it didn't remove people's broader liberty rights under the Due Process Clause.[33] Requiring a fetus to be transferred instead of terminating it may infringe upon bodily autonomy and an individual's right to refuse medical treatment.

A critical legal question arises regarding whether fetuses implanted in an artificial womb should be afforded personhood protections prior to birth, or if a new category of legal status is required.[34] Some scholars have even suggested neologisms such as "fetonate" to describe these entities—beings that exist ex utero but have not yet fully formed. This category could also fill a gap in fetal protection laws that currently assume intrauterine gestation.[35] Otherwise, damage to an artificially gestated

[32] Julia Dalzell, *The Impact of Artificial Womb Technology on Abortion Jurisprudence*, 25 Wm. & Mary J. Race, Gender, & Soc. Just. 327 (2019), https://scholarship.law.wm.edu/wmjowl/vol25/iss2/4/.
[33] U.S. Const. amend. XIV.
[34] Crocker, *supra* note 8.
[35] Jessica H. Schultz, *How Will Artificial Wombs Affect the Legal Status of a Fetus or Embryo?*, 89 Chi-Kent L. Rev. 421 (2020).

fetus—whether by negligence, system failure, or by purpose—could not be prosecutable under existing laws related to wrongful death or fetal injury.[36]

The BAIPA grants legal rights to infants who show signs of life after being born, yet assumes separation from a maternal body. If AWT allows the fetus to be viable outside the womb long before what is traditionally considered birth, some states might stretch the definition of "born alive" so that it includes artificially gestated fetuses.[37] However, such changes would likely be unevenly implemented. States such as Alabama have previously enacted broad fetal personhood laws,[38] potentially offering legal protections much earlier in gestation than states like California, which continue to rely on viability as the standard.[39] This discrepancy can lead to an uneven or confusing national framework filled with uncertainty.[40]

The Supreme Court's decision in *Gonzales v. Carhart* (2007), which upheld the constitutionality of bans on certain abortion methods once a fetus reaches viability, gains renewed significance when viewed through the lens of AWT.[41] If AWT caused viability to be reached sooner, courts may

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[36] De Bie et al., *supra* note 13.
[37] Romanis, *supra* note 11.
[38] Megan Messerly, *'Scratching their heads': State lawmakers take a closer look at personhood laws in wake of Alabama ruling*, Politico (2024).
[39] ACLU of N. Cal., *Know Your Rights: Abortion Access in California* (Oct. 2024), https://www.aclunc.org/our-work/know-your-rights/know-your-rights-abortion-access-california.
[40] Claire Horn, *Legal Frameworks for Artificial Wombs, Abortion, and Care* (2021) (Ph.D. thesis, Birkbeck College, Univ. of London).
[41] *Gonzales*, 550 U.S. at 2.

uphold stronger fetal protections. This evolution could weaken the legal underpinnings for abortion access by reinforcing the notion that a state interest in fetal life does not have to be weighed against maternal health interests if pregnancy is no longer physically necessary.

AWT also complicates the legal foundations of parental rights and responsibilities, well beyond personhood.[42] Historically, parental rights derive from genetic information, gestational connection, or contractual intent. In *Johnson*, intent was advanced as the key factor in defining familial relationships within surrogacy.[43] While *In re Baby M* (1988) cautioned against hastily conferring rights in novel reproductive arrangements, AWT completely severes the gestational connection, so intent may become the dominating factor in determining legal parenthood.[44] Courts may be confronted with questions of guardianship in cases of embryonic transfer, divorce, or differing opinions on the continuation of gestation.[45] While surrogacy precedents might give us some guidance here, those precedents were not drafted with ex utero gestation in mind.

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[42] Skinner v. Oklahoma, 316 U.S. 535, 536 (1942).
[43] *Johnson*, 5 Cal. 4th at 93, 102-103.
[44] In re Baby M, 109 N.J. 396, 411 (1988).
[45] Mennesson v. France, 65192/11 Eur. Ct. H.R. (2014).

Furthermore, issues of criminal and civil liability also arise with AWT. Moreover, if an AWT system malfunctions or fails—leading to injury or death—is the event medical malpractice, technological negligence, or wrongful death? In contrast to a traditional pregnancy—where biological factors specific to the individual may affect why a pregnancy will or will not work—AWT places all the blame on the doctors and biotechnological developers. Artificial gestation may also require novel categories of liability. Concepts are further complicated with intentional harm—whether by a practitioner, a third party, or a system developer. Current fetal protection laws utilize a maternal-fetal relationship to determine jurisdiction. Whereas in cases of artificial gestation, legal standing might transfer to the genetic parents, a court-appointed guardian, or the state. Such deficiencies in current legal frameworks emphasize the necessity of enacting laws that also consider non-gestational fetal developments.

X. International Context and Conflict of Law

The legal implications of AWT are not confined to the United States. Different countries have varying definitions regarding when fetal personhood begins.[46] In jurisdictions that are pro-life leaning—such as

[46] Bowlby v. Pippard, 1975 WL 293 (UK).

Poland or El Salvador—AWT may be used to justify even more expansive fetal rights earlier in gestation.[47] By contrast, countries with less restrictive abortion frameworks—such as Canada or the Netherlands—are likely to maintain birth as the defining moment.[48] Presented with diverging policies, these questions lead to critical concerns about reproductive tourism and cross-border legal conflict. Individuals seeking AWT procedures in countries with more permissive laws may encounter conflicts regarding fetal status, parental rights, or liability for harm incurred abroad. Moreover, artificially gestated individuals may also face significant challenges in securing citizenship, inheritance, or other rights under international law, as their mere existence in a jurisdiction may be contested without a cohesive legal framework governing their origins.

These legal ambiguities highlight the need for a revised regulatory paradigm that can reflect the unique status of artificially gestated life. As courts and legislatures begin to address the implications of AWT, it is equally important to consider how the law will define personhood and parenthood, alongside the ethical, social, and institutional frameworks necessary to facilitate AWT's integration. The following section will analyze

[47] Zuzanna Stawiska, *Poland's Abortion Reform Stalls as Coalition Politics Clash with Campaign Promises*, Health Policy Watch (2024).
[48] Ellen R. Wiebe et al., *Can We Safely Stop Testing for Rh Status and Immunizing Rh-Negative Women Having Early Abortions? A Comparison of Rh Alloimmunization in Canada and the Netherlands*, 1 Contracept. X 100001 (2018).

the regulatory and policy challenges involved in properly balancing reproductive autonomy, medical advancement, and equitable access to the same in a post-Dobbs world.

XI. AWT, Gender Equality, and Socioeconomic Access

The implications of AWT would be highly impactful to gender dynamics, as it would lessen the physical and medical burden placed on women throughout much of history due to pregnancy.[49] For women and people assigned female at birth, pregnancy has historically led to obstacles in career progression, physical autonomy, and health, all of which can contribute to wage gaps, workplace discrimination, and restrictions. By separating gestation from the body, AWT—especially in partial form—presents a medical solution that could allow individuals to avoid maternity-related leave, physical strain, and bias in hiring or promotion. It also offers reproductive options for people who have medical conditions, including cardiovascular disease or uterine anomalies, that make pregnancy unsafe or impossible.

Although AWT will advance reproductive freedom, it will also raise ethical and legal concerns regarding fair access. As with many new medical

[49] De Bie et al., *supra* note 13.

technologies, AWT will mostly begin as an expensive medical treatment that is primarily accessible to wealthier patients.[50] In this case, however, it could lead to a two-tiered reproductive system, where those who have the economic means opt for artificial gestation, at the same time lower-income groups satisfy traditional pregnancy, with assumed health and economic consequences. Legislative measures—such as insurance mandates, subsidies, or integration with public health—may be needed to grant equitable access and avoid AWT transforming into a reproductive luxury.

Furthermore, reproductive coercion is another concern that needs to be addressed. Although AWT might be shaped as empowering, it could also be coercively used by employers, the government, or institutions to steer reproductive decisions.[51] For instance, employers could subtly pressure their employees in high positions or competitive industries to prefer AWT over natural childbirth by referring to savings on maternity leave, healthcare expenditures, or workplace accommodation arrangements. Policymakers can promote AWT as a cost-control strategy in state-run systems on the basis of the assumption that maternal and neonatal outcomes will demonstrably change for the better, particularly in settings characterized by high maternal morbidity. Although

[50] *Id*.
[51] Romanis, *supra* note 15.

fully eliminating the burdens of gestation would require complete ectogenesis—a goal that is not yet available, in any case—states are likely to pursue it as a policy tool for narrower cases since *Dobbs* expanded the regulatory authority of states to oversee reproductive choices.[52]

Historical precedents underscore these concerns. Historical abuses, such as sterilization programs, biased use of contraceptives, and coerced medical experimentation, illustrate how reproductive technologies have been manipulated in order to control marginalized groups.[53] Without robust legal protections, AWT is vulnerable to becoming another instrument of this control, with policies potentially emerging that deny rights to natural pregnancy or limit access to artificial gestation for specific demographics, raising significant constitutional and human rights questions.

Additionally, AWT intersects with protections for gender equality under the Equal Protection Clause and anti-discrimination statutes. Existing workplace protections—such as Title IX of the Civil Rights Act ("Title IX") and the Pregnancy Discrimination Act ("PDA")—rest on the assumption that pregnancy is intrinsically female.[54] Therefore, if artificial

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[52] *Dobbs*, 597 U.S. at 2.
[53] Elizabeth Chloe Romanis, *Artificial Womb Technology and the Choice to Gestate Ex Utero: Is Partial Ectogenesis the Business of the Criminal Law?*, 28 MED. L. REV. 342 (2020), https://doi.org/10.1093/medlaw/fwz037.
[54] U.S. Equal Emp. Opportunity Comm'n, *Pregnancy Discrimination and Pregnancy-Related Disability Discrimination* (2024), https://www.eeoc.gov/pregnancy-discrimination.

gestation eventually becomes available to persons of any sex—including transgender and nonbinary people—there may need to be changes in current administrative structures to incorporate access to parental benefits, leave, and insurance coverage in an inclusive way.[55] An example of this is employers that offer accommodations only to physically pregnant employees could unwittingly deny AWT users comparable benefits, thereby introducing a new form of discrimination.[56] Likewise, courts may need to reconsider distinctions under the Americans with Disabilities Act (ADA) or state-level family leave laws, especially as AWT disputes binary definitions of sex, gender identity, and reproductive capacity.[57]

As AWT broadens the definition of biological parenthood and encompasses nontraditional family structures—such as same-sex couples, transgender individuals, and single parents—it may also reshape legal and cultural understandings of motherhood, fatherhood, and gestational roles. Nonetheless, these changes will probably lead to new legal arguments about custody, genetic parenthood, and decision-making authority. When gestation is able to occur completely independently of a human host, courts will need to establish standards for assigning parental rights and

[55] Romanis, *supra* note 15.
[56] *Id*.
[57] Americans with Disabilities Act of 1990, 42 U.S.C. §§ 12101 et seq. (2018), https://www.ada.gov/law-and-regs/ada/.

obligations. Traditional frameworks based on gestational or biological connections may no longer be sufficient.

Furthermore, revised inclusive family law reform is needed to address these challenges. Emerging definitions of parental rights must be shaped by the legal recognition of an array of family structures—especially ones where race, gender, and sexual orientation intersect. For instance, litigation may arise concerning custody issues involving anonymous gamete donors, disputes among same-sex parents, or decisions regarding the continuation of gestation in an AWT context.

Lawmakers who are committed to realizing the egalitarian potential of AWT should pursue targeted actions, including public subsidies, non-discriminatory employment policies, and revisions to Title IX, the PDA, and similar reproductive protections at the state level.[58] If left unregulated, AWT risks becoming a landscape of legal ambiguity and socioeconomic inequity, driven more by market forces and political agendas than by principles of equity and reproductive freedom.[59]

[58] Romanis, *supra* note 15.
[59] Horn, *supra* note 27.

XII. Legal, Psychological, and Social Implications of Artificial Womb Technology

AWT complicates prevailing legal understandings of reproduction and sex-based classifications. Furthermore, sex-based distinctions receive intermediate scrutiny under the Equal Protection Clause, as seen in *United States v. Virginia* (1996).[60] Laws such as Title IX and the PDA presume that gestation is female by default, yet AWT's perspective, which allows gestation to occur without female anatomy, accepts the possibility that gestation is possible without female anatomy.[61] Therefore, courts may soon need to reconsider whether those protections apply equally across sex and gender identities.

How AWT is classified in law, as assisted reproductive technology ("ART") or as neonatal care, will play a major role in the lawsuits involving AWT. As ART, it might resemble embryo custody cases such as *Hecht v. Superior Court* (1993), which brought into focus the issue of who was exercising parental rights over fetuses in utero.[62] If treated as neonatal care, hospitals and providers might face greater liability, forcing courts to determine who has medical authority. Although some scholars propose

[60] United States v. Virginia, 518 U.S. 515, 516 (1996).
[61] Romanis, *supra* note 15.
[62] Hecht v. Superior Court, 16 Cal. App. 4th 836, 837 (1993).

creating a new regulatory category, courts are more likely to adapt existing ART and neonatal doctrines to the AWT context.

Furthermore, AWT has the potential to raise debates beyond legal classifications, with questions about psychological and social outcomes for those gestated outside the body. Gestation normally involves intensive hormonal and sensory exchanges essential to both the development of the nervous system and the regulation of emotion. AWT removes these interactions, which may have unknown cognitive or emotional effects. While there are studies on premature infants and Neonatal Intensive Care Unit (NICU) environments that offer some understanding of early physical development, there's virtually no research on possible long-term psychological or social effects of artificial gestation. This lack of sufficient data presents legal and policy challenges to AWT-born individuals, particularly regarding the need for new educational, healthcare, and legal protections tailored to their unique circumstances.

Additionally, AWT is at risk of experiencing similar pushback from society to medical options such as In Vitro Fertilization (IVF) and surrogacy. Yet, the complete removal of human gestation may be even more contentious in cultural and legal matters. Fears of being seen as "engineered" or "unnatural" may result in discrimination or psychological

harm. Current case law in ART tends to favor intentional parenthood over gestational or genetic connections, making it important for AWT to also extend these precedents to nonbinary, transgender, or same-sex parents.[63]

Moreover, courts may need to rethink attachment-based parenting claims. Theories such as Bowlby's attachment model focus on initial bonding experiences, usually around pregnancy and birth.[64] In AWT, where physical gestation is nonexistent, the establishment of biological parenthood and associated legal responsibilities may have to follow new standards focused on emotional intent and caregiving, independent of whether a biological contribution has occurred.

The introduction of AWT is anticipated to elicit varied global responses.[65] Countries, including Canada and the Netherlands, might permit clinical tests. Whereas countries with stringent reproductive legislation might attempt to ban AWT entirely. These disparities could lead to cross-border reproductive tourism, where affluent individuals seek AWT services abroad, leaving economically disadvantaged populations behind. Such travel may create conflicts between citizenship and legal parentage

[63] In re Marriage of Buzzanca, 61 Cal. App. 4th 1410, 1425 (Cal. Ct. App. 1998).
[64] Saul McLeod, *Bowlby's Attachment Theory*, Simply Psychology (2023), https://www.simplypsychology.org/bowlby.html.
[65] Office of the U.N. High Commissioner for Human Rights, *OHCHR Report 2021* (2022), https://www.ohchr.org/sites/default/files/2022-06/OHCHR_Report_2021.pdf.

akin to those considered in *Mennesson v. France* (2014), in which the European Court of Human Rights ruled on recognition of children born via foreign surrogacy.[66] Therefore, without international treaties or agreements, AWT-born individuals may be at risk of finding legal recognition, nationality, or a parent.

XIII. Conclusion

AWT is not just a scientific innovation—it is a deep legal and ethical inflection point. By dividing gestation from the human body, AWT defies centuries-old assumptions about pregnancy, fetal viability, parental rights, and personhood.[67] In the current post-Dobbs society, in which federal abortion rights have been stripped away, AWT's advent risks further eroding constitutional understandings of bodily autonomy and reproductive freedom. States could attempt to rationalize new abortion restrictions by claiming that AWT offers a non-lethal alternative, thus redefining viability and moving the focus away from maternal burden.[68] At the same time, existing frameworks for parental rights—based on gestation, biology, or intent—are ill-suited to cases where no gestational

[66] *Mennesson*, 65192/11 Eur. Ct. H.R. (2014).
[67] Cohen, *supra* note 1.
[68] Brown, *supra* note 10.

parent exists. Adopting terms such as "fetonate" into legal language is indicative of how existing doctrines are inadequate to address the new moral complexities around legal status, liability, and guardianship.[69] Simultaneously, the long-term developmental, psychological, and social consequences of ex utero gestation are unknown, raising urgent questions about what forms of protection AWT-born individuals may need.

In order to ensure that AWT emerges as a tool of empowerment rather than exploitation, legal systems must be proactive. New legal categories must be specified by legislatures to differentiate partial from full ectogenesis—such as the determination of the boundaries of parental rights and responsibilities in case of partial ectogenesis—along with criminal and civil liability in environments of artificial gestation. Regulatory bodies must continue to guard against reproductive coercion, discriminatory access, and commercialization—as AWT threatens to exacerbate class and gender inequities.[70] Courts will need to navigate emerging conflicts regarding parenthood, consent, and bodily autonomy, taking a long-term perspective on safeguarding individual rights amidst scientific transformation. Additionally, on the international front, harmonization will be critical, as cross-border reproductive tourism

[69] De Bie et al., *supra* note 13.
[70] Romanis, *supra* note 15.

and disputes over citizenship will only continue to grow. Policymakers, legal scholars, bioethicists, and impacted communities must collaborate in order to adapt frameworks that advance autonomy and equity while upholding human dignity. The future of reproduction is advancing at a pace that surpasses the legal and ethical frameworks currently in place. The question that remains is whether AWT will expand reproductive justice—or whether it will become a tool of surveillance, control, and inequality. The choices and actions of the present will redefine reproduction as a liberatory frontier or plunge it into a new era of contested rights and structural inequity.