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ORIGINAL RESEARCH

Personhood Begins at Birth: The Rational Foundation for Abortion Policy in a Secular State

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Abstract The struggle over legal abortion access in the United States is a religious controversy, not a scientific debate. Religious activists who believe that meaningful individual life (i.e., "personhood") begins at a specific "moment-of-conception" are attempting to pass laws that force this view upon all pregnant persons, irrespective of their medical circumstances, individual preferences, or personal religious beliefs. This paper argues that such actions promote a constitutionally prohibited "establishment of religion." Abortion policy in a secular state must be based upon scientifically accurate biology, not unprovable theological presuppositions. The scientific facts regarding human pregnancy do not support the position that personhood begins with fertilization—at which point a pregnancy does not yet even exist. Abortion policy should regard the embryo/fetus as part of the pregnant individual's body until delivery. We argue that individual "personhood" only begins when the *latent* potentialities of the fetal nervous system are *actualized* in the newborn after delivery. The paper argues that instantiating non-scientific beliefs concerning embryonic/fetal "personhood" into the law as the basis for abortion policy establishes a state-sponsored religion. The protection of religious liberty requires that abortion be decriminalized. Abortion should be treated like any other medical procedure and regulated similarly. To protect both religious freedom and sound medical practice, individual legal personhood should be recognized as beginning only at birth.

Keywords Abortion · Abortion policy · Fetal personhood · Religious perspectives on the fetus · Religious liberty · "Moment of conception" · Genetic abnormalities · Church and state · Establishment of religion · Missouri · Ethics · Bioethics · Reproductive freedom

Personhood Begins at Birth: The Rational Foundation for Abortion Policy In A Secular State

The public policy debate on induced abortion in the United States is contentious because it is essentially a theological—not a scientific—debate (Greenhouse 2022). This paper addresses scientific and philosophical issues surrounding laws that outlaw abortion in parts of the United States. The details of these laws vary from jurisdiction to jurisdiction, but they all seek to prohibit abortion beyond some arbitrary gestational age (often before pregnancy is even clinically apparent).

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Anti-abortion campaigners promote a scientifically false, distorted picture of human reproductive biology in their relentless assault on women's healthcare and reproductive rights. This false biological narrative declares that a unique human individual is created at a "moment-of-conception" and that if left unmolested by external intervention, this entity will *inevitably* become a living child (Ratsinger and Bovone 1987). This scientifically erroneous narrative further maintains that there is a seamless biological continuum from zygote to embryo to fetus to child to mature adult. Those who hold this "continuity hypothesis" (Bermudez 1996) see no moral difference whatsoever between a newly fertilized egg and its developmental successors, which they see as having exactly the same moral status as all other "persons." Consequently, they believe these entities should therefore all be given the same legal protection. This is the official theological position of the Roman Catholic Church, as expressed in the document *Donum Vitae*: "The human being is to be respected and treated as a person from the moment of conception …" (Ratsinger and Bovone 1987).

Anti-abortion activists claim this view represents a generally accepted consensus among scientists studying reproductive biology. It does not. This opinion is neither a scientific conclusion, nor does it represent in any way the generally accepted view of specialists in reproductive biology: it is a religious dogma that advocates are attempting to instantiate into law under the false claim of its being a scientific truth. In reality, this view is little more than theological folk-biology, a mythological "pseudo-embryology" attempting to masquerade as science (Gilbert 2023).

The Abortion Debate Is Theological, Not Scientific

The advocates of the view that "life begins at the moment-of-conception" are actively working to incorporate their personal religious beliefs into law. They see the struggle to accomplish this as a holy war, sanctioned by their religious views (Miller 2014). In the words of Lawrence Tribe (1992), they see this as "a clash of absolutes" in which opposing metaphysical presuppositions about human life are in conflict with one another. The science of developmental biology cannot adjudicate this dispute because it is not about the interpretation of data or the nature of scientifically observed reality. It is a clash of incompatible worldviews.

Sociologist Kristen Luker reached precisely this conclusion in her pioneering study *Abortion and the Politics of Motherhood* (1984) which remains as relevant today as it was forty years ago. She wrote (1984, 158–159):

> … when pro-life and pro-choice activists think about abortion, abortion itself is merely "the tip of the iceberg." Different beliefs about the roles of the sexes, about the meaning of parenthood, and about human nature are all called into play when the issue is abortion. … At the same time, precisely because these values are so rarely discussed overtly, when they are called into question, as they are by the abortion debate, individuals feel that an entire world view is under assault. … By definition, those areas covered by a "world view" are those parts of life we take for granted, never imagine questioning, and cannot envision decent, moral people not sharing. … What is at odds is a fundamental view of reality. … In the course of our interviews, it became apparent that each side of the abortion debate has an internally coherent and mutually shared view of the world that is tacit, never fully articulated, and, most importantly, completely at odds with the world view held by their opposition.

In short, the dispute about abortion is a religious dispute, not a scientific one. The attempt to enshrine the scientifically false biological beliefs of the anti-abortion community into law is, at bottom, an attempt to establish a state-sponsored religion that imposes particular sectarian religious beliefs on all members of society. This coerces people with different beliefs to adhere to religious requirements that not only are not their own but which are unsupported by the known facts of human reproductive biology. In addition to being a bad foundation for public policy, it is also unconstitutional.

The Missouri Example

A paradigmatic example of legislators enshrining their personal theological viewpoints into law is the total ban on abortions found in Missouri House Bill

No. 126, which was passed and signed into law in 2019 (Blackmon v Missouri 2023).[1] This Missouri law contained "trigger provisions" that would automatically outlaw all abortions in the state should the Supreme Court overturn the right to abortion previously guaranteed by *Roe v Wade*. Only a few hours after the Supreme Court overturned *Roe* on June 24, 2022, in its decision in the case of *Dobbs v Jackson Women's Health Organization,* the Attorney General and Governor of Missouri issued opinions and proclamations stating that the total abortion ban was now immediately in effect. They took pride in thus making Missouri the first state to outlaw abortion in the United States.

During the debates on this legislation, its sponsors and supporters openly stated their goal was to enshrine their own particular religious beliefs into law, and they "ignored the testimony of clergy who warned that targeting [abortion] providers to limit abortion access impermissibly imposed one religious view on everyone else" (Blackmon v Missouri 2023, Complaint ¶9). The Missouri bans on abortion violate the religious freedom of those who have different views because the law is based on a single, narrow Christian sectarian interpretation of when meaningful individual human life begins, a non-medical interpretation of what abortion entails, and a specific theological definition of what constitutes a "person."

This law has been challenged by a group of thirteen Missouri clergy from a wide variety of religious traditions, eleven of whom claim the law infringes on their individual religious liberty, violates both the Missouri and the U.S. constitution, and creates an impermissible "establishment of religion." The plaintiffs include four ministers of the United Church of Christ, one United Methodist pastor, the Episcopal Bishop of Missouri, two clergy from the Unitarian Universalist Church, and four rabbis representing the Orthodox, Reform, and Conservative branches of Judaism (Blackmon v Missouri 2023). These clergy argue that "legislators have no right to ban abortion based on their view of when life begins, because when life begins is a religious question on which people of different faiths and no faith hold differing views" (Blackmon v Missouri 2023, Complaint ¶81). Their lawsuit clearly documents the extensive record of sponsoring legislators planning to give their personal religious dogma the force of Missouri law-.:

During the legislative debates over H.B. 126, Missouri legislators expressly stated their intent to impose on Missourians of all faiths a specifically conservative Christian, religious view about the beginning of life. The bill's sponsors and supporters made that intent plain again and again during floor debates over the bill in the Missouri House of Representatives on February 26–27 and May 15, 2019, and in the Missouri Senate on April 18 and May 15, 2019.

During these debates, members of the Missouri legislature explained the law in starkly religious terms.

For example, during the House floor debate on February 26, 2019, one of the H.B. 126's co-sponsors, Representative Ben Baker, urged support for H.B. 126 by exhorting his colleagues:

> "Ladies and gentlemen, from the one-cell stage at the moment of conception, you were already here. We just couldn't see you yet. And what makes you valuable is that you equally share the image of our Creator. You are His work of art. And the masterpiece of your life will only happen if you allow it to develop."

Another H.B. 126 co-sponsor, Representative Barry Hovis, similarly explained during the February 27, 2019, floor debate:

> "So I had to make a decision on when I believe that life was present. And being from the Biblical side of it, I've always believed that life does occur at the point of conception."

And the lead sponsor of H.B. 126, Representative Nick Schroer, emphasized the importance of having religious precepts, including that life begins at conception, written into the legislative findings of the bill. In an exchange with his co-sponsor Representative Hovis on May 17, 2019, Representative Schroer explained:

> 'I'll say this again, as a Catholic, I do believe life begins at conception, that is built into our legislative findings currently in law…'"

(Blackmon v Missouri 2023, Complaint ¶125–129)

[1] *Blackmon v Missouri* (Missouri Trial Court, 2322-CC00120, 17 March 2023) https://clearinghouse.net/case/43985/.

False Assertions About Human Reproductive Biology

We identify in this essay numerous false assertions about reproductive biology that religious advocates such as those in Missouri are using to advance their bogus embryological narrative. This narrative is part of a broader campaign of biological misinformation being undertaken to confuse the public in general—and pregnant women in particular—about the nature, risks, and complications of induced abortion. False assertions concerning these matters are found throughout the anti-abortion literature (Rowlands 2011). They form the basic texture of discourse at the thousands of so-called "crisis pregnancy centres" that falsely masquerade as clinics offering comprehensive reproductive healthcare but which are really evangelization centres that attempt to persuade pregnant women to adopt the theological beliefs and erroneous biological views of the sponsors of such centres (ACOG 2022; Polcyn et al. 2020; Montoya et al. 2022; Villarreal 2023). This deceptive misinformation campaign also permeates the Catholic healthcare system across the United States and denies appropriate medical care to many women with pregnancy complications (Guiahi 2018; Freedman and Stulberg 2013; Freedman et al. 2008; Raghavan 2007). The debate about access to abortion is not a debate over science; rather, it is a fight over whether or not religious zealots will be able to impose their own religious beliefs on American society under false scientific cover.

Determining When a "Person" Begins Is not a Scientific Question

The question "When does life begin?" is problematic. Scientists generally agree that the biological phenomenon of life on earth began approximately four billion years ago, when organic molecules suspended in a primordial ocean began organizing themselves into self-replicating structures (Miller 1953; Service 2019). (Whether or not a Divine Intelligence played a role in this process is beyond the purview of scientific inquiry.) The general question of how life on earth originated is, however, not of particular interest to the advocates of abortion prohibition; rather, their concern is to establish when a new legally protectable individual "person" begins. Anti-abortion advocates view "persons" as originating during a discrete and specific event they call "conception." But "conception" is actually a theological postulate, not a scientific observation. As bioethicist and theologian Ronald Green writes (2001, 35):

> In the Bible, the first human being, Adam, came into existence at the moment God breathed into the mud of creation. This idea carries over to the individual "creation" events that are believed to mark the start of each subsequent human life. At some moment God acts to form a soul from the pre-existing matrix of matter in the womb, with the result that a unique person comes into being.

The debate about when an individual human "person" begins, then, is mythological, theological, and philosophical in nature. It is not a question that can be answered using scientific methodology. Developmental biologists can look at individual cells or organisms under a microscope, making observations about the presence or absence of various phenomena or describing various biological processes—but nothing more. Any *significance* that might be attributed to those phenomena is based upon value judgements which themselves are based on prior notions of what characteristics are "significant." Before you can observe a "person" you must define the characteristics that constitute a "person"—and that is a philosophical or theological question, not a scientific one. Ronald Green lays this clarification out quite clearly when he writes (2001, 32):

> Determination of morally significant points within these processes inevitably involves choices and decisions. It is not just a matter of *discovering* important events in the entity that must dictate our judgment. Rather, identifying these events requires us to identify and apply the values that underlie our thinking. Drawing on those values, we must *decide* which events are most important to us among the range of alternatives.

Anti-abortion advocates seek a single criterion upon which to make their claims about embryonic and fetal "personhood," but the practical and philosophical issues cannot be reduced to a single criterion (Warren 2000). As Green eloquently writes (2001, 50):

> … efforts to define humanity in terms of a single intrinsic property, such as genetic identity, rationality, or self-awareness go awry. All these efforts begin by focusing on some feature normally present in beings that we acknowledge as deserving of moral protection. Working on the assumption that determining humanity in a moral sense is a matter of identifying that property, they then make this feature a necessary and sufficient condition for the possession of full moral protectedness. But this approach misses the fact that protectedness is established by the choice of a marker or event for which a variety of independent, intersecting, and compelling reasons exist.

Defining which characteristic(s) determine "personhood" is therefore an arbitrary choice, not an inherent property of biology, and thus it lies outside scientific methodology. Indeed, the search for a single characteristic or property that would determine what is and what is not a person has proven to be unhelpful, elusive, and morally problematic (Warren 2000).

Laws that impose a specific legal determination of when an individual human life begins are above all else the imposition of a philosophical or religious viewpoint upon the public. Many individuals hold other, diametrically opposed, views as to when an individual human life begins and of the moral and ethical obligations that these views require of them. To be forced by law to adopt a religious view imposed by the state is an unconscionable intrusion upon religious freedom. The imposition by the state of religious views upon those who do not hold them is a substantial and irreparable harm, prohibited by the United States Constitution.

"Fertilization" and "Conception" Are Not the Same Thing

"Fertilization" is a modern scientific term used in biology to refer to the formation of a zygote by the union of egg and sperm as it was first observed in the nineteenth century (Briggs and Wessel 2006). "Conception" is a much older theological term that means something quite different and implies the direct activity of God in producing pregnancy. For example, Francois Mauriceau, the leading obstetrician of seventeenth century France, wrote "Conception is nothing else, but an action of the womb, by which the prolific seeds of the man and woman are there received and retained, that an infant may be engendered and formed out of it" (Mauriceau 1673, 12). For Mauriceau "conception" was a total process directed by God's creative activity. This is theological biology, not science.

The belief that "conception" requires the direct creative activity of God has deep Biblical roots. Genesis 4:1–2 (Revised English Bible) says: "The man lay with his wife Eve, and she conceived and gave birth to Cain. She said 'With the help of the Lord I have brought into being a male child.'" The book of Ruth (4:13) states, "So Boaz took Ruth and she became his wife. When they had come together the Lord caused her to conceive, and she gave birth to a son." In the New Testament book of Luke, the angel of the Lord appears to Mary and announces (Luke 1:31): "'Do not be afraid, Mary, for God has been gracious to you; you will conceive and give birth to a son, and you are to give him the name Jesus.'" Such "conception" is not simply the union of male and female gametes—it is a theological process.

"Conception," as classically understood, is a kind of menage-a-trois involving sperm, egg, and the hand of God. As the *New Advent Catholic Encyclopedia* explains it (2023): "The person is truly conceived when the soul is created and infused into the body." Theologically defined "conception" involves ensoulment; biologically defined "fertilization" does not. They are entirely different entities. "Conception" is a theological idea that lies beyond the realm of scientific observation.

Abrahamic Religions Did Not Traditionally See Fertilization as the Beginning of Personhood

It is important to note that none of the Abrahamic religions (Judaism, Christianity, and Islam) traditionally endorsed a belief in "personhood begins at fertilization." "Moment-of-conception" personhood was officially promulgated by the Roman Catholic church as its official position only in the mid-nineteenth century as a convoluted solution to a specific theological problem: "the Immaculate Conception" of the Virgin Mary (Green 2001; Dombrowski and Deltete 2000).

This is a doctrinal problem in one Christian sect that has no basis whatsoever in scientific biology.

Prior to the promulgation of this specific Catholic dogma, Christian teaching held that personhood emerged gradually as the embryo/fetus acquired human form and shape, with final "ensoulment" only occurring at mid-pregnancy (as evidenced by "quickening," the first perceptible fetal movement). Early Christian thinkers adopted Aristotle's embryology (the prevailing science of the time), in which the embryo/fetus underwent a series of transformations, each associated with a particular kind of "soul." In the first stage, the developing embryo had a "vegetable soul;" that is, it was biologically alive, but had a moral status indistinguishable from a stalk of asparagus. As intra-uterine development proceeded further, the fetus developed an "animal soul," and was similar in nature to, say, a dog. Only after a fully developed human form was available to receive the postulated human "soul" could a true person come to inhabit that body. This process, posited by St. Thomas Aquinas, came to be called "dynamic hylomorphism" or "immediate animation and delayed hominization" (Dombrowski and Deltete 2000).

Roman Catholic theologians produced "moment-of-conception" ensoulment to solve a theological conundrum created by other church doctrines. The Catholic Church viewed Jesus of Nazareth as the literal Son of God, the product of a "spiritual" interaction (never explicitly described) between God and Mary, who was said to be a virgin at the time Jesus was conceived. But if Mary was human, then she was also irrevocably tainted by Original Sin since she was descended from the mythological *ur*-parents of humanity, Adam and Eve. If Jesus was born of a Divine Father but a human mother, he himself would be similarly tainted by Original Sin through his maternal ancestry. This conclusion was theologically unacceptable.

The way the Catholic Church got around this conundrum was by the declaration of Pope Pius IX in 1854 that Mary herself had been untainted by sin at the time she herself was conceived. Mary's "ensoulment" was said to have occurred at that "moment-of-conception" (the biology of which was never specified) and thus, by extension, so too were all human persons thus ensouled at the "moment" of their conception—even an ectopic pregnancy (Dombrowski and Deltete 2000). This was a purely theological conclusion completely ungrounded in biological reality and unsupported by any scientific observations.

"Moment-of-conception" personhood is therefore a very late theological doctrine in Roman Catholic Christianity, a doctrine grounded in a particular theological perspective, and not based upon any deep understanding of the science of human reproduction (which, frankly, did not yet exist in 1854). Church historian David Badham (1987) has concluded "the view that personhood dates from conception, has virtually no significant support in the [Christian] tradition prior to the teaching of Pius IX."

Like traditional Christianity, Islam also holds the belief that individual human beings achieve personhood through a process of gradual development. Full human personhood is attained gradually, not at a postulated "moment-of-conception." Both the Qur'an and the traditions (*hadith*) of the Prophet Muhammed clearly describe a gradual process of intra-uterine embryonic development from its beginnings as an extract of clay, then as a drop of fluid lodged securely in the uterus, gradually turning into a clinging mass of formed and unformed blood and tissue, finally becoming a being with bones clothed in flesh (Qur'an 22:5; 23:12–14; 40:67; 75:37–38). Allah is then believed finally to instill in this creation the soul that transforms it into a human person.

Daar and Al-Khitamy summarize the Muslim understanding this way (2001): "The general Islamic view is that, although there is some form of life after conception, full human life, with its attendant rights, begins only after ensoulment of the fetus. On the basis of interpretations of passages in the Qur'an and of the sayings of the Prophet, most Muslim scholars agree that ensoulment occurs at about 120 days (4 lunar months plus 10 days) after conception; other scholars, perhaps in the minority, hold that it occurs at about 40 days after conception."

Views of the moral status of the embryo and fetus in Jewish law (*halakha*) are clear and explicit, with a long tradition of scholarly religious commentary (*midrash* and *parshanut*). The Jewish position has held explicitly that the fetus is not an independent human being but is part of its mother until it is born—a view realistically grounded in human reproductive biology. The Talmudic phrase is that the fetus is *ubar yerekh imo*, literally "the fetus is the thigh of its mother" (Feldman 1995:253). Rabbi Susan

Grossman in her 2003 position paper for the Rabbinical Assembly stated,

> Abortion is a serious matter not to be entered into lightly, out of respect for the potential life vested in the fetus. Nevertheless, Jewish law considers the fetus part of the mother's body and not an independent being until birth. Therefore, while the fetus is to be cherished as potential life, the mother's life and well-being takes precedence over that of the fetus until birth.

The view of the fetus as part of its mother rather than as an independent person goes back thousands of years into the ancient Hebrew legal traditions from which modern Judaism sprang. Because an embryo or fetus was part of the pregnant woman rather than an independent entity, causing the loss of a pregnancy was not murder or even manslaughter (unless the woman herself died in the process). Embryonic or fetal loss was a property crime whose victim was not the pregnant woman but rather was her husband, who had lost part of his patrimony (Exodus 21:22–25). The Revised English Bible translates this passage from Exodus:

> When, in the course of a brawl, a man knocks against a pregnant woman so that she has a miscarriage but suffers no further injury, then the offender must pay whatever fine the woman's husband demands after assessment. But where injury [to the woman] occurs, you are to give life for life, eye for eye, tooth for tooth, hand for hand, foot for foot, burn for burn, bruise for bruise, wound for wound.

This did not mean inflicting the same physical injury on the guilty party, however; it referred to the payment of appropriate restitution based on the nature of the injury received by the pregnant woman herself.

Subsequent Rabbinic teaching in the Mishnah ("Oral Torah") maintained that the fetus becomes a full person (*nefesh*) only when the greater part of it is born, it begins to breathe the outside air, and it joins the human community in the extra-uterine world separate from its mother. Until that time, the embryo/fetus is part of its mother, and maternal life always takes precedence over fetal life, even up to the moment of birth. The Mishnaic passage in Oholoth 7:6 (as translated by Danby 1933) clearly articulates this rule, stating "If a woman was in hard travail [that is, she is in "obstructed labor" and thus unable to deliver the fetus because of a constriction in her birth canal], the child must be cut up while it is in the womb and brought out member by member, since the life of the mother has priority over the life of the child" Later Rabbinic commentaries on this passage even declare that there is a positive duty to sacrifice the life of the fetus in order to save that of the mother, should it be necessary. As the Talmudic scholar Rabbi Chayim Ozer Grodzinsky said, "Of course one is obligated to sever a limb in order to save the life of the whole body …" (Schiff 2002, 120–121).

The subordination of fetal life to maternal life is also explicitly acknowledged in another passage in the Mishnah (Arakin 1:4), which deals with the case of a pregnant woman who has been convicted of a capital crime and as a result is sentenced to death. Since the fetus is regarded as part of the mother and not as an independent person, the execution is to be carried out forthwith, even though it causes the death of the fetus. No "person" other than the pregnant woman is harmed because the fetus is not regarded as an independent being. The only "person" affected is the condemned woman.

A *nefesh*—a person—is a living, breathing individual outside of and therefore separate from the body of its mother. The Jewish understanding of life requires the onset of breathing. Just as in Hebrew mythology when God breathed life into Adam and so caused him to live, so too must the fetus begin to breathe as a newborn in order to become a person. Indeed, *nefesh* means "the breath of life" (and is also sometimes translated as "soul"). It is only when the greater part of the fetus emerges from the mother's body into the air and takes in the breath of life does it become a newborn person (Grossman 2003), until then, it is regarded as "like its mother's thigh," a part of her body.

Individual Life Does Not Begin at a Discrete Moment

The belief that "life begins at the moment-of-conception" is a fundamental tenet of the religiously motivated anti-abortion movement. This is the (recent) dogmatic assertion of the Roman Catholic Church, not a generally accepted scientific truth. Neither

"conception" nor "fertilization" are acknowledged by the scientific community as marking the beginning of individual life. The distinguished developmental biologist Scott Gilbert, author of one of the most widely used textbooks in the field, declares unequivocally, "… I can say very few things with absolute certainty. However, one thing I can say with absolute and total certainty is this: There is no consensus among biologists as to when independent human life begins" (Gilbert 2023).

Ronald Green notes that the belief in a discrete "moment-of-conception" is rooted in Hebrew mythology, not developmental biology. This mythology is grounded in anthropomorphism: that is, in the attribution of human personality and characteristics to cellular or subcellular phenomena. The folk-biological narrative embraced by abortion opponents describes the subjugation of a passive ovulated (female) egg that is penetrated by an active (male) spermatozoon in a manner similar to that of a human male penetrating a vagina with his penis during sexual intercourse (Beldecos et al. 1988; Martin 1991). While this view may be a seductive legislative fantasy, it is far removed from what actually happens at the cellular level during fertilization.

The merger of the egg and sperm in fertilization does not involve the sudden forceful entry of the spermatozoon into the egg, nor does it happen immediately after intercourse at a single "moment-of-fertilization." Sperm must live for many hours within the female reproductive tract before they attain the capacity to fertilize an egg, and fertilization thereafter occurs only gradually after a period in which the male and female gametes "spoon" together side by side as their cellular membranes dissolve. As Gilbert notes (2008), "… there is no 'moment of fertilization,' but rather a lengthy process that can take days to complete."

There is likewise no obvious biological marker that definitively delineates the completion of fertilization. As Green summarizes the problem (2001, xiii):

> "When does human life begin?" Many people who oppose abortion quickly reply, "At the moment of conception." But in response to this familiar answer, biological research raises a new question: "What do you mean by 'the moment of conception?'" Research shows that conception (fertilization) involves a "complex sequence of coordinated events" stretching over hours or even days. At what point in this sequence can we say that something morally or spiritually decisive has happened? How can we find bright moral lines when nature offers only continuous biological processes? Our increasing ability to study every step in early development of the embryo sharpens these questions. Those unwilling to be challenged by them retreat to more comforting answers from the past. No longer an answer to a question, the statement "Life begins at conception" becomes a refusal to consider the question at all.

The so-called "moment-of-conception" is incomprehensibly vague and completely unsuited for use as a meaningful legal concept applicable to twenty-first century cell biology and high-technology reproductive science. Vaguely written laws passed by legislators ignorant of the molecular and subcellular processes involved in fertilization will wreak havoc in the fields of biotechnology, stem cell research, infertility care, and clinical practice, especially when such laws are enforced by scientifically ignorant but politically ambitious district attorneys. The comforting theological platitudes of centuries past will not serve as adequate foundations upon which to construct reliable legal guidelines for modern reproductive technology.

The "Human Soul" Is Not Made of DNA

A major reason that "moment-of-conception" mythology is popular with conservative religious dogmatists is that it resonates with their belief that there is a specific moment of human "ensoulment" (aka "conception") after which the now-ensouled entity becomes a human person (Green 2001; Dombrowski and Deltete 2000). The belief that "ensoulment" occurs at the time of fertilization is actually *not* the traditional view of any of the Abrahamic religions (Judaism, Christianity, or Islam); nonetheless, in their attempt to find a discrete uni-criterial marker for the establishment of individual personhood, modern advocates of forced birth argue that the creation of an individual genome is the moral equivalent of "ensoulment" (Ratsinger and Bovone 1987). Thus John Noonan writes (1970, 57):

> The positive argument for conception as the decisive moment of humanization is that at conception the new being receives the genetic code. It is this genetic information which determines his characteristics, which is the biological carrier of the possibility of human wisdom, which makes him a self-evolving being. A being with a human genetic code is man.

This is a clever (but ultimately unsuccessful) attempt to replace the postulated mythical soul with a chemical surrogate: deoxyribonucleic acid (DNA); but DNA is only a complex biochemical molecule, not a mysterious spiritual essence. As sociologists Dorothy Nelkin and M. Susan Lindee wrote in *The DNA Mystique: The Gene as a Cultural Icon*, "… this idea of genetic essentialism has been readily adopted in popular forums where DNA—the invisible, eternal, and fundamental basis of human identity—has acquired many of the powers once granted to the immortal soul" (2004, 57).

The theological sleight-of-hand involved in substituting "a human genetic code" for "a soul" to make it seem "scientific" begs the question of what actually constitutes a "human genetic code"? What are its components and detailed characteristics? How do you determine what is "human" DNA and what is not? Such specific questions are becoming more and more problematic as our understanding of the detailed structure and variations of human genes increases. Detailed analyses of ancient DNA have shown that the DNA of anatomically modern humans is mixed with DNA from Neanderthal and Denisovian ancestors (Slon et al. 2018; Villanea and Schraiber 2019; Wielgus et al. 2023). The genomes of humans, chimpanzees, and bonobos are remarkably similar (Prufer et al. 2012; Suntsova and Buzdin 2020)—in fact, they are nearly 98% identical (Marks 2002). Some humans lack a full set of chromosomes (45 X,O or "Turner's Syndrome") while others have more chromosomes than normal (Trisomy 21 or "Down Syndrome"; or 47,XYY males). Are these individuals "human," or are they something else? How much of a "human genetic code" do you need to be "human?"

Not only is genetic determinism politically dangerous (viz. the history of the German Third Reich), but it is also completely at odds with current scientific understandings of the interactions between heredity, the environment, and the factors that influence gene expression (Gibney and Nolan 2010; Barker 1998; Gibson 2008). How genes are ultimately expressed in a specific biological organism and what that individual organism ultimately becomes are not predestined by chromosomal DNA; rather, how those genes are expressed is quite variable, the result of a complex interplay between genes, circumstance, and the environment (Gibson 2008).

A Fertilized Ovum Is Not a "Unique Individual"

The new combination of DNA that exists when a zygote is formed does not, in fact, result in a unique individual entity until much later in biological development. Each division of a zygote's daughter cells produces a new group of totipotent blastomeres, each of which can become a separate biological entity under the right conditions. This happens relatively commonly when the developing cell mass splits to form identical twins or triplets. As Ronald Green has eloquently remarked (2001, 29):

> If biological humanness starts with the appearance of a unique diploid genome, twins and triplets are living evidence that the early embryo is not yet one human being, but a community of possibly different individuals held together by a gelatinous membrane.

The replicating mass of cells that forms the blastocyst does not become a single discrete biological entity until after gastrulation, some fourteen days after fertilization, at which time the blastomeres lose their totipotentiality and start to form the discrete layers of the trilaminar germ disk that will eventually differentiate into specific organ systems (Tyser and Srinivas 2022). Therefore, it is unequivocally true that a unique biological individual is *not* formed at fertilization. This is a scientific death blow to the belief that unique biological "individuals" exist from the "moment of conception."

Fertilization Does Not Mark the Beginning of a Pregnancy

The scientifically false biological narrative promoted by anti-abortion advocates also ignores the crucial distinction between fertilization and pregnancy.

A pregnancy does not begin until the blastocyst implants. In normal pregnancies, implantation takes place in the progesterone-primed endometrial lining of the uterus. Thereafter a unique bidirectional communication system develops between an embryo-fetus and the woman in whom it develops, creating a complex, interlocking fetal-maternal system that regulates pregnancy (Cunningham et al. 1993). The woman whose ova have been extracted by laparoscopy, fertilized artificially in a laboratory, then frozen and stored for possible future implantation, is not *herself* pregnant; her fertilized eggs reside outside of her body. Pregnancy begins with the implantation of the blastocyst. This definition is even enshrined in the code of Federal regulations relating to the protection of human subjects in research.[2] An abortion therefore occurs when the implanted blastocyst is disrupted, whether such disruption occurs spontaneously (i.e., a miscarriage) or is induced. The anti-abortion laws as currently written would allow the prosecution of individuals who knowingly or accidentally destroy a fertilized egg, *even though no pregnancy yet exists*. Whatever the death of a fertilized egg prior to implantation may be—whether this occurs inside the female reproductive tract, in a clinical laboratory, or somewhere else—it is not an "abortion" because a pregnancy does not exist prior to implantation. Even more important is the understanding that only a very small number of fertilized eggs ever produce ongoing pregnancies.

Enormous Embryo Wastage Characterizes Normal Human Reproduction

Perhaps the most important single fact about human reproduction is the enormous wastage of fertilized eggs that occurs under normal circumstances every day. A fertilized egg has, at best, about a 20 per cent chance of progressing to a term pregnancy. To suggest that a fertilized egg has the same moral status as an adult human being is simply preposterous.

Nearly fifty years ago, in a landmark article titled "Where have all the conceptions gone?," Roberts and Lowe (1975) showed that nearly 80 per cent of all fertilization events in England and Wales aborted spontaneously. The enormous wastage of fertilized eggs that takes place prior to implantation and during early pregnancy has become ever more clearly documented in the years since this pioneering paper (Macklon et al. 2002; Chard 1991; Buss et al. 2006; Gray and Wu 2000; Niakan et al. 2012). Figure 1 graphically illustrates the enormous wastage of fertilized ova during early human reproduction, primarily because of lethal genetic defects.

This fundamental biological truth about human reproduction has still not yet penetrated public consciousness, due to the continuous assertion of biological falsehoods by anti-abortion campaigners. This enormous natural wastage of fertilized eggs has stunning implications for public policy. As Roberts and Lowe noted (1975), "If Nature resorts to abortion to maintain genetic stability by discarding as many as 3 in every 4 conceptions, it will be difficult for anti-abortionists to oppose abortion on moral and ethical grounds." Ronald Green (2001, 37) concurs, wisely asking "In view of this high rate of embryonic loss, do we truly want to bestow much moral significance on an entity with which nature is so wasteful?" Church historian David Badham wrote about the implications of this enormous loss of fertilized ova: "Yet if belief in the universal salvific will of God is joined to a belief that every single fertilised ovum is a human person, then Christians would have to postulate a heaven populated largely by unformed zygotes!" (Badham 1987).

If we were to take seriously the supposed moral equivalence of the zygote and the adult human—and no society in human history has ever done so in actual practice—it would require the complete reorganization of our healthcare system because the number of fertilized-but-dying eggs greatly exceeds the number of deaths from other causes (Wall and Brown 2006; Sandel 2006). To grant fertilized eggs moral status equivalent to adults would require shunting vast amounts of money and resources away from current clinical priorities into the care of the dying embryos that are being discarded every day by the natural genetic winnowing of human reproduction. Reallocating medical resources in such a way would not only be biologically preposterous, it would also be politically suicidal for anyone who seriously tried to do so. As Wall and Brown wrote (2006):

[2] Code of Federal Regulations. Title 45, Part 46, 46.202 Definitions. https://www.ecfr.gov/current/title-45/subtitle-A/subchapter-A/part-46/subpart-B/section-46.202.

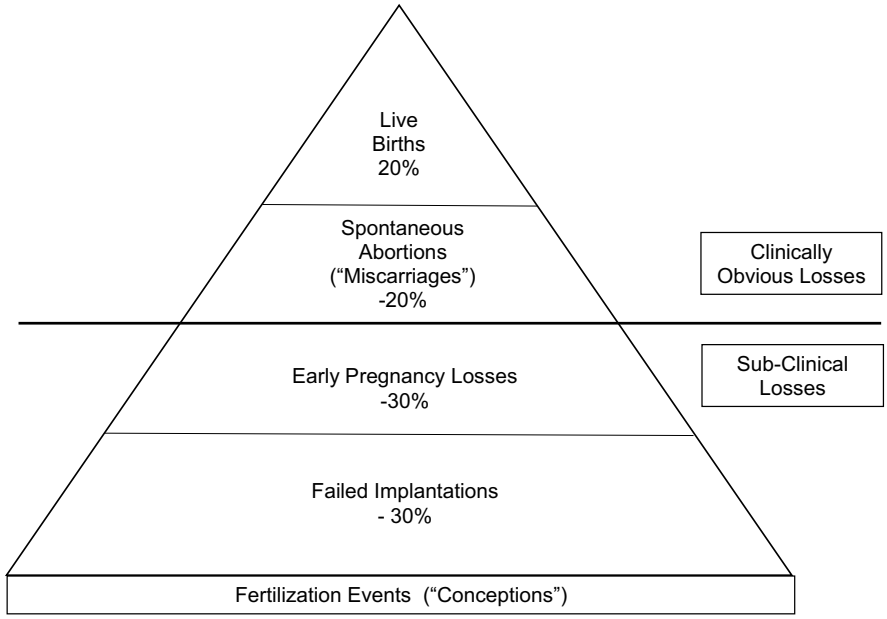

Fig. 1 The "fertilization-loss iceberg," showing the high rates of pre-implantation embryonic death and early pregnancy loss, most of which occur before clinical awareness of the pregnancy has occurred. Redrawn based on Macklon et al. (2002) with additional date from Roberts and Lowe 1975; Chard 1991; Buss et al. 2006; Gray and Wu 2000; and Niakan et al. 2012. Copyright by L. Lewis Wall, used by permission

If each of these lost fertilizations has the same moral status as an adult human being, the economic, social, and political consequences that logically follow from this premise would require a cataclysmic reorganization of health care services. … On simple utilitarian grounds alone, if we accord the newly conceived zygote the same moral status as a child or an adult, taking this position mandates a massive redistribution of health care resources in the United States. If we accept the personhood of a newly fertilized ovum, then the zygote, the morula, the fragile blastocyst, and the newly implanted embryo should become the central focus of our national health care system, and the rest of us must step to the back of the line. To do otherwise would be both hypocritical and morally indefensible—if zygotes have the same moral status as the rest of us.

The Moral Significance of Birth

A familiar trope from forced-birth advocates is that there is no essential difference between a late-gestational fetus in the uterus and a newborn infant of the same gestational age. This idea is called "the continuity hypothesis" (Bermudez 1996), but although rhetorically resonant, it is scientifically unconvincing. There is an almost incomprehensively vast difference between a fetus in its mother's uterus late in gestation and the same newborn in its mother's arms following birth. The neonate possesses morally relevant properties that the fetus simply does not have. As Kingma notes, the fetus is "inside the maternal organism, and directly involved in its physiological processes." Birth, therefore "is not a mere change of location, but a substantial change. … Birth marks the beginning of the human, and any other mammalian, organism" (Kingma 2020).

The fetus in utero is completely dependent upon the pregnant woman for every vital function. It is not an independent biological entity until after it is born. In utero, its sustenance comes entirely from its mother, its nutrients transferred across the placenta into the fetal circulation. Fetal respiration is a maternal pulmonary function, not a fetal one. The fetal lungs are incapable of gas exchange as they are filled with liquid while in the uterus. Oxygen inhaled into the pregnant woman's lungs is transferred to her blood, then transported across the placenta into the fetal circulation. Likewise, the carbon dioxide produced by fetal cellular respiration is transferred from the fetal circulation across the placenta to the maternal bloodstream, where it is carried to her lungs to be expelled from her body. The placenta also removes the excretory waste, which is why a fetus that develops without kidneys (bilateral renal agenesis) can survive until delivery, only to die thereafter from renal failure. Separation of the placenta from the uterus terminates the fetal life-support system and creates an independent entity.

Birth requires the fetus to transition abruptly from a physiologically dependent organism supported by the placenta into a self-sustaining, physiologically independent being. If the newborn does not take over the vital bodily functions that were previously performed by the placenta, it will die. As the newborn attempts to take its first breath, enormous physiological changes are required for a successful transition to the extra-uterine environment. Sharma and colleagues (2014) have called this the "period of the most dramatic and rapid physiological changes seen in humans." Failure to make these changes is lethal.

The most immediate life-critical change required is the transition to pulmonary respiration. As Del Negro and colleagues write (2018): "Despite the deceptive simplicity of breathing—the essential elements of which develop in utero—it requires a sophisticated motor program to ventilate the lungs and respond appropriately to physiological challenges and changing environmental conditions." This is no easy task. In utero, the fetal lungs are filled with fluid, which must be resorbed for oxygenation to occur across the pulmonary alveoli. This fluid resorption starts with a catecholamine surge at the onset of labour. The pulmonary lymphatic system must immediately be engaged to move this lung fluid into the interstitial space and away from the alveoli so that gas exchange can begin (Fu et al. 2023). Additional fluid is removed from the lungs by compression as the fetus is squeezed through the birth canal. After the head and chest emerge, the neonate must take its first breath to kick-start the respiratory system.

As Sharma and colleagues write (2014), "The coordinated first breath is initiated centrally due to arousal from sound, temperature changes and touch associated with delivery" as the fetus emerges into the air of the external environment. The neuromodulatory chemoreceptor neurons of the retrotrapezoid nucleus of the brainstem seem to control the life-critical rhythms of breathing. These neurons must switch on after delivery to keep respiration going and prevent sudden death (Shi et al. 2021). The ingress of air into the previously sterile alveoli also exposes the newborn lungs to a host of hostile environmental pathogens, potential bacterial infection, and harmful inflammatory responses. The first breath must activate the alveolar macrophage cells of the pulmonary immune system to control this environment (Saluzzo et al. 2017).

As the lungs expand, pulmonary vascular resistance falls, requiring vast compensatory changes in the circulatory system. Because oxygenation takes place through the placenta and not the lungs, the fetal circulatory system is completely different from that of an extra-uterine adult (Tan and Lewandowski 2020). Oxygenated blood entering the fetal circulation from the placenta passes through the umbilical vein, into liver and the ductus venosus, then into the inferior vena cava. Part of this blood crosses through the foramen ovale from the right atrium into the left atrium and then into the left ventricle, from which it is pumped by the heart into the head to oxygenate the fetal brain and the upper body. Less-well oxygenated blood returns to the right atrium and then to the right ventricle, which pumps it through the ductus arteriosus to the lower half of the fetal body and through the umbilical arteries to the placenta, where it is re-oxygenated. Only a small proportion (8–10 per cent) of the cardiac output goes through the lungs in the fetus. Thus, in the fetus there are two circulatory pathways running in parallel with the right ventricle providing 65 per cent of the cardiac output and the left ventricle supplying 35 per cent (Sharma et al. 2014). In the adult, the ventricles both carry the same workload.

At birth, the placenta is no longer available to oxygenate the blood, so there must be a radical shift in the

circulatory pathways (Tan and Lewandowski 2020). As the umbilical cord is clamped and the placenta separates, peripheral vascular resistance dramatically increases as the umbilical arteries shrink. The blood passing through the ductus venosus slows to a trickle as this shunt begins to constrict. The sudden expansion of lung volume as the fetus starts to breathe drops the resistance in the pulmonary circulation, and blood flow to the left atrium increases. This causes the foramen ovale to close almost immediately, while blood flow across the ductus arteriosus is reversed. Loss of vasodilators from the placenta (prostaglandin E_2) facilitates closure of the ductus arteriosus. These changes all result in a shift from the intra-uterine fetal circulatory pattern to the extra-uterine adult circulatory pattern. Failure to accomplish the transition to the extra-uterine adult circulatory pattern can be fatal. Not only is there a huge change in the circulatory pattern of the cardiovascular system at birth, there is also a qualitative change in the heart muscle itself. The fetal heart has a fixed stroke-volume and in order to pump more blood during times of stress, the heart rate must increase. At delivery the muscle cells of the heart must change to a pattern of hypertrophic growth to allow increases in cardiac stroke-volume (Tan and Lewandowski 2020).

Other major mandatory physiological transitions required for extra-uterine life include a shift from the production of fetal haemoglobin to adult haemoglobin (critical for oxygen transport), taking over the regulation of body temperature (in utero thermoregulation is largely controlled by the amniotic fluid and the maternal environment), and the critical need to utilize the newborn's own kidneys to filter waste and excrete it. The shift from placental nutrition to nutrition exclusively by oral intake is also required. After delivery, the gastrointestinal tract must now function in a way that was never necessary during fetal life. The fetus must undergo extraordinary physiological transformations to shift from being an appendage of the pregnant body to becoming an independently functioning extra-uterine physiological individual.

But the most profound changes that occur in the newborn occur in its nervous system, where birth sets off an explosion of neurological activity as the fetus exits the womb and enters the brave new world of the extra-uterine environment. Consciousness occurs at birth, and this is when meaningful extra-uterine existence begins.

During fetal life the nervous system develops incrementally. Consciousness and sentience arise in the cerebral cortex, and prior to the full development of the cerebral cortex and its interconnectivity with other parts of the brain, sentience and consciousness are not possible. These neural interconnections develop late in gestation (Lee et al. 2005; Salomons and Iannetti 2022) but are not activated until after delivery. Mammalian fetuses (including humans) are maintained in utero

> … in sleep-like states by several endogenous neuro-inhibitory mechanisms involving adenosine (a potent neuro-inhibitory and sleep-inducing agent), allopregnanolone and pregnanolone (two nonsteroidal anaesthetics), prostaglandin D2 (a potent sleep-inducing hormone), a placental neural inhibitor, warmth, buoyancy and cushioned tactile stimulus. (Mellor and Diesch 2006).

The fetus in utero is neither sentient nor conscious. It is only when it is jarred awake by entry into the extra-uterine environment, "exposed to air, gravity, hard surfaces, unlimited space and, usually, to cold challenge for the first time" and by the withdrawal of neuro-inhibitory substances when the placenta separates that the fetus is aroused from its intrauterine stupor (Mellor and Diesch 2006; Mellor et al. 2005). The working party on fetal awareness of the Royal College of Obstetricians and Gynaecologists in Great Britain concluded (RCOG 2010):

> Sedation of the fetus and suppression of cortical arousal in times of stress imply that the cortex in utero responds differently from the neonatal cortex and that it is only after birth, with the separation of the baby from the uterus and the umbilical cord, that wakefulness truly begins.

The fetus does not become an actual individual organism until it has separated from its mother (Kingma 2020), and it does not become an *actual* person until the awakening of consciousness begins to occur after delivery.

We grant moral status on the basis of *actual* conditions, not on the basis of theoretical or *potential* circumstances. Roman Catholic theologians Thomas Shannon and Allan Wolter have asked (1990) "given the standard definition of personhood used in Catholic moral theology—an individual substance of a rational

nature—questions are raised about the rational nature. When might one consider such a rational nature to be present?" Our answer to this question is that meaningful rational nature is not present until after birth when the fetal neuropsychological system is "activated" by entry into the outside world. To use a more traditional theological concept, *this* is when "ensoulment" occurs.

The Proper Foundation for Abortion Policy Is "Personhood Begins at Birth"

For something to have "moral status" means merely that it should be considered (to some degree) when ethical decisions are made (Warren 2000). Moral status is not absolute; it exists in degrees. Moral status is best evaluated using multiple interconnecting criteria rather than a single catch-all criterion such as a mythical but non-existent "moment-of-conception" (Warren 2000).

The value of embryonic and fetal life is relative, not absolute. Every decision as to whether or not a pregnancy should be aborted—or terminated by premature delivery—is unique. Each case must be decided in light of its individual context, not on the basis of an arbitrary theological presupposition that it "possesses a soul from the moment of its conception." To unjustly privilege a particular sectarian theological viewpoint and to force others to regulate their lives and reproductive decision-making according to it is offensive to the principles of equality before the law, freedom of religious expression, and the mandate that the state shall not favour one sectarian religious viewpoint over another. To instantiate into law the dogma that personhood begins at the "moment-of-conception" (a philosophical/theological postulate, not a scientific fact) is to establish a state religion in the matter of abortion. That must not be permitted.

If we acknowledge that the question of "when does an individual life begin?" is not one that can be answered through scientific observation, how do we formulate a satisfactory foundation for public abortion policy? Such a foundation must protect both individual religious liberty and individual bodily autonomy (a prerequisite for ethical medical decision-making). We maintain that the most compelling position is to regard individual human personhood as only beginning at birth. This view does not require pregnant persons who hold a "moment-of-conception" viewpoint to change their opinions or behaviours with respect to their own pregnancies or force such individuals to violate their own religious beliefs in making difficult pregnancy decisions. However, forcing those who do not accept "moment-of-conception" personhood theology to continue pregnancies that they wish to abort for personal and/or medical reasons is a serious infringement on both their personal bodily autonomy and on their religious liberty.

The "personhood only begins at birth" position also has substantial consequentialist advantages. "Personhood only begins at birth" avoids the major social, legal, and political problems that inevitably follow adoption of an absolutist "moment-of-conception" theology.

First, by recognizing the embryo/fetus as part of the body of the pregnant woman, the obtuse philosophical conundrum of how two distinct and morally equivalent persons can occupy the same physical body is removed. They can't and they don't. The fetus is part of the person who is pregnant until they are separated at delivery (Kingma 2020).

Second, recognizing birth as the beginning of meaningful individual human personhood eliminates most of the outlandishly dangerous consequences of "moment-of-conception" theology. These include:

- the assertion that a frozen fertilized ovum stored in a container of liquid nitrogen has exactly the same moral status as a living adult;
- the possibility of charging a surgeon with murder for removing a fallopian tube in which a life-threatening ectopic pregnancy has developed—something that happens in approximately 2 per cent of all implanted pregnancies (Tonick and Conageski 2022);
- the possibility of charging a surgeon with murder for treating a patient in whom the "moment of fertilization" has resulted in the development of a tumour (molar pregnancy) or even an aggressive cancer (choriocarcinoma) instead of a normal pregnancy (Hoffner and Surti 2012; Candelier 2016; Horowitz et al. 2021; Soper 2021);
- the logical necessity of restructuring the entire healthcare system to place the "interests" of pre-implantation and very early embryos ahead of those of children and adults because 80 per cent of

fertilized eggs die from lethal genetic abnormalities;

- the senseless cruelty of forcing someone to continue carrying to delivery a fetus diagnosed with a lethal disorder, thereby forcing her to risk serious obstetric complications—including major surgery or even death—for a fruitless outcome;
- the dangerous policy of requiring a woman with rupture of the membranes before fetal viability to await the onset of life-threatening sepsis before delivery is permitted simply because a fetal heartbeat can still be detected (Abrahami et al. 2022; Linehan et al. 2016; Wall 2022; Sklar et al. 2022; Gordon et al. 2022);
- the likely creation of Reproductive Health Police empowered to investigate intrusively (including the use of involuntary pelvic examinations) any woman undergoing a spontaneous abortion under suspicion that she might somehow be involved in the murder of a "pre-embryonic person;"
- the censorious legal scrutiny of every woman's behaviour during pregnancy to detect cases of possible "intra-uterine child abuse and neglect" because she fails to follow medical advice or if she happens to succumb to the use of illegal or deleterious substances during pregnancy while battling a substance-abuse disorder (Roth 2002; Goodwin 2020);
- the creation of an Orwellian army of informer-vigilantes who are rewarded by the state for monitoring women's menstrual cycles and contraceptive practices to catch possible abortion-facilitators or abortion-offenders (a chilling reality in 1980s Romania under the dictator Ceaucescu and an emerging reality in Texas today (Stephenson et al. 1992; Tsai and Ziegler 2021; Charo 2021).

In all of these cases, the brunt of the legal consequences of forced birth arising from "moment-of-conception" personhood will fall upon the poor, the disadvantaged, the less well-educated, the less well-connected, the socially marginalized, groups with differing theological viewpoints, and/or members of ethnic minority groups disfavoured by the elites who control the political process (Gordon et al. 2022; Foster 2020; Kimport 2022).

Third, by recognizing that personhood only begins at birth, legally mandated gestational term-limits on induced abortion can be replaced by individualized medical judgements made on a case-by-case basis. Decisions regarding the termination of a pregnancy should be decriminalized, removed from the realm of politics, and returned to the domain of clinical decision-making where they belong (De Meyer 2021). Ethical decisions in these matters are not always easy, but they certainly should not be made in a state legislature, in the media, or by public officials playing to a political grandstand.

Decisions about whether or not to terminate a pregnancy (and how to carry out that termination if it is done) should be made in the medical, not the legal or political, system. Clinical decisions regarding pregnancies and the management of pregnancy complications should be made by patients in partnership with their physicians, with appropriate input from family members and trusted personal advisors, just as is done with other difficult medical matters, free from meddling theologians. To critics who say that this would allow people to make decisions that they themselves would not make, the proper response is that we allow people to make decisions all the time with which we would personally disagree. The attempt to legislate a legally enforced nationwide prohibition of religiously disapproved behaviours ends in disaster, as the attempt to outlaw the production and sale of alcoholic beverages between 1920 and 1933 in the United States demonstrated.

Legislators cannot possibly write laws to cover every imaginable clinical scenario in which the decision to abort a pregnancy is an appropriate, reasonable, well-considered, and humane medical decision. Restrictive legislation intended to buttress a particular theological viewpoint concerning abortion inevitably means that laws will be written in obstetrical ignorance by medically untrained and biologically ill-educated religious zealots whose primary intent is to force society to adopt their personal religious viewpoints. The decision to perform an abortion or to undertake a premature delivery in any set of circumstances should be a medical decision best left to the judgement of specialist clinical caregivers and their patients. Laws regarding abortion should be written to protect this process, not to undermine it.

The vast majority of induced abortions in the United States occur early in pregnancy. Induced abortion in the United States in the first trimester is markedly safer than childbirth (Schummers et. al. 2022). The risk of dying in childbirth is fourteen times

higher than undergoing a legal induced abortion under medical supervision (Raymond and Grimes 2012). In 2020, over 80 per cent of abortions took place at or below nine weeks' gestational age, and over 93 per cent occurred at or below thirteen weeks' gestational age (Kortsmit et al. 2022). Less than 1 per cent of induced abortions occurred at or beyond twenty-one weeks' gestational age (Kortsmit et al. 2022). Six American states (Alaska, Colorado, New Jersey, New Mexico, Oregon, and Vermont) as well as Canada and Israel currently have no gestational age limits on abortion, leaving this matter to the judgement of patients in consultation with qualified, licenced medical practitioners. These policies have not led to massive numbers of abortions late in pregnancy. Abortions later in gestation are complex (Kimport 2022). The vast majority of third trimester abortions involve fetal structural and/or chromosomal anomalies incompatible with life (Bosma et al. 1997; Dommergues et al. 1999; Barel et al. 2009, Rosser et al. 2022). Very often these cases arise unexpectedly from a late diagnosis made in a *wanted* pregnancy, with couples struggling in agony to decide what is right to avoid unnecessary suffering. Their right to make such decisions free from religiously imposed state interference must be protected. Adopting the policy position that individual personhood only begins at birth protects such decisions. "Moment-of-conception" personhood does not.

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