The Snow Children:
Human Life from Zygote to Zombie

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--- 1: Introduction ---

Science experiments on human embryos have cornered philosophy into difficult ethical positions and have left the artificially-conceived-and-cryopreserved persons in an ambiguous state of existence. The byproduct of in-vitro fertilization (IVF) has resulted in hundreds of thousands,[1] if not millions, of human embryos in cryostorage who are now in an indefinite state of preservation, kept as obsolete reserves once produced in case of failures in implantation and gestation procedures.

The current situation is not only how do we treat these frozen human embryos – these snow children – but also how do we recognize them as human persons? In their current cryopreserved condition, they remain in a limbo state of existence: they are alive but not living, they are zygotes but appear more like zombies, they are animate yet made inanimate (what exactly is the state of their souls?), they are in the act of being but their potentiality is on pause indefinitely, and some embryos have even been in storage longer than they would have lived if their right to birth had not been denied.

The closest analogy we have to understanding the status of the snow children is the personhood of a human being while asleep or awake, but what of these particular persons who have never slept, nor ever been awake? What of these persons forced to remain in the embryonic

[1] Eleonora Porcu, Patrizia Ciotti, and Stefano Venturoli, *Handbook of Human Oocyte Cryopreservation* (Cambridge: Cambridge University Press, 2012), p. 1.

state: deprived of life, yet not dead? Forbidden to live and also forbidden to die? How do we justify their continued preservation if there are no moral and dignified means to fulfill their birth? And what is our responsibility to these persons when resources to sustain their storage become overly burdensome and extraordinary in means of care?

In order to address these ethical questions, we must first discuss and clarify the metaphysical existence of these frozen entities and their personhood. This paper attempts to do such a thing, relating natural biological states with that of cryopreservation. Only after the metaphysical state of the embryonic person is clarified will the ethical ramifications be addressed.

--- 2: Personhood on Pause: Are Snow Children Really People? ---

The majority of the scientific community – even those in the fields of cloning, embryonic stem-cell research, fertility alternatives, abortion and artificial contraception – concurs that the ethical standard when working with humans is founded upon personhood: whether the human embryo is legally and socially recognized as a person or not.[2]

The focus of this section of the paper is the personhood of the human embryo conceived extracorporeally and apart from the conjugal act, i.e., conceived through *in vitro* (Latin for *in glass*, as in a laboratory petri dish) fertilization, and then subjected to cryopreservation (a process of storing the embryo in liquid nitrogen or other sufficient freezing agent). If not in a cryopreserved state, the embryo is growing, developing, acting as it ordinarily would. The life of the embryo, as nurtured by the mother (or laboratory technician), proceeds and is observable. There is no question that the zygote – the one-cell embryo that begins to exist with the fusion of

[2] Ibid., 1-3.

the sperm and the oocyte membranes[3] – is genetically unique[4] and possesses DNA that serves as an indication of the "new, complete and unique genome constituting an indisputable biological sign of the presence of a new human being/person."[5]

Biologically, the DNA serves as the constant of identity as the animal organism (human or otherwise) develops seamlessly from zygote, morula, blastocyst, gastrula, embryo, fetus, infant, child, adolescent, and finally adult. In philosophical terms, the DNA could be the physical sign of a living thing's "perduring *substance* that acts as the abiding center and reservoir of an entity's built in potentiality".[6] Otherwise, every developmental stage in an organism would be interpreted as a new unrelated being coming out from a previous unrelated being, but in fact it is only the butterfly metamorphosing from its larval stage, only the bullfrog maturing from its state as a tadpole, only a sequoia originating from its seed. The necessity and reality of this fact is demonstrable from ordinary life and even from environmental conservation efforts: a farmer expects kernels to sprout and grow into corn, and to destroy his supply of kernels is to deprive him of a corn crop and deny him a livelihood; a conservationist of wild pandas expects fertilized panda eggs to gestate, come to birth and mature into adult pandas, and to extract such embryos in utero (or deny them implantation) is to render great harm to the endangered panda population.

Yet, not only does an individual person's DNA stand as a constant in her physical identity, but the DNA also differentiates her from those most like her: from her parents, her siblings, other relatives and other human persons, and namely from her mother (all the while maintaining her membership in the human species). Though the embryo be within the body of

[3] Juan R. Velez, "Why Respect for the Human Embryo?" *Linacre Quarterly*, 4 (2002), pp.316-337 (319).
[4] Keith Moore, *Before We Are Born: Essentials of Embryology and Birth Defects*, (Philadelphia: W.B. Sunders, 1998), p. 39.
[5] Velez, "Why Respect for the Human Embryo?" p. 320.
[6] John R. Meyer, "Embryonic Personhood, Human Nature, and Rational Ensoulment," *Heythrop Journal*, XLVII (2006), pp. 206-225 (p. 211).

the mother and is reliant on her nourishment, the embryo is a distinct human person and not mere inferior biological material at the mercy of others. This is made especially clear when it is understood that the zygote at its conception "becomes active in the process of controlling the production of new proteins… and has a basic genetic and constitutional independence from its mother. It is another human being that expresses physiological signals to the mother's organism to continue pregnancy".[7]

However, the embryo of the human person stands apart from other animal and vegetative embryos in that not only does its DNA serve as a constant of its identity and as an individualizing principle, but its immortal and rational soul does also serve these roles, and perhaps even more so. According to John R. Meyer in "Embryonic Personhood and Rational Ensoulment":

> Empirical evidence cannot prove the existence of a person in the human zygote or embryo, and the same is probably true of intrinsic causal factors like human DNA. There must be a metaphysical cause or principle for inscribing and interpreting the genetic code, and the morphogenesis (development and growth) of an organism cannot be adequately explained by appealing to the genome alone. After all, even though each cell contains the same genetic code, not every gene is expressed in different organs.[8]

The moment of ensoulment, of *anima*tion (*anima* is Latin for *soul*), becomes then the moment a human person is fully individualized, present and distinguished from mere biological matter, from other members of its species, and even from its twins, if it should have any. But what and when exactly is this moment of animation? What exactly is this soul that provides the "something more than biological signs of individuality needed to convince people of the personhood of human embryos?"[9]

[7] Velez, "Why Respect for the Human Embryo?" p. 319.
[8] Meyer, "Embryonic Personhood, Human Nature, and Rational Ensoulment," p. 219-220.
[9] Ibid., 220.

The essence of a human being is not equal to a complete genetic code. The individuality of a particular whole organism depends not only on its genome but on its life principle which gives the genome life, the spiritual soul.[10] In other words, we are not our DNA; our worth is not in our genetic code, for if it were so, then each and every presence of our DNA would demand respect and protection, from our every strand of hair, flake of skin, crumb of scab, and even every cancerous cell – and this would be scrupulous, impossible, and absurd to our lived experience.[11]

Instead, the rational soul of a human organism acts as the person's formal cause; it drives the genome, activates, animates and rouses it from remaining as mere code into a self-determining and living out of its information and instructions for cellular organization, growth and development, ultimately allowing the person to live, learn, think, contemplate, choose, act and love.[12] "From the moment of the fusion of… the male and female pro-nuclei (when the sperm is engulfed by the oocyte) they become one unit, a new being that is 'intrinsically oriented and determined to a definite development.'"[13] In fact, without the soul driving the genome, the DNA would not only be unfulfilled and unrealized, but would not even exist at all; without the soul present to organize and conduct its activity, the DNA molecule would disintegrate into unintelligible and purposeless chemicals. The very fact that reanimation (revitalization) is impossible if the soul is forced from the genome (also known as *death*) further enforces the reality of the soul as a living thing's non-material life principle. The resuscitation of DNA is

[10] Velez, "Why Respect for the Human Embryo?" p. 320.
[11] For further discussion on this absurdity as related to induced pluripotent stem cell research, see: Thomas V. Cunningham, "Skepticism about the 'Convertibility' of Induced Pluripotent Stem Cells," *The American Journal of Bioethics*, 13, 1 (January, 2013), p. 40.
[12] For further discussion about how [harmonious embryonic cellular organization and differentiation] provides evidence of the individual soul, see: Jason Eberl, "A Thomistic Perspective on the Beginning of Personhood: Redux," *Bioethics*, 21, 5 (June, 2007), pp. 283-289 (284).
[13] Ibid., 321.

simply beyond our abilities and beyond nature because the soul is beyond our grasp to manipulate and is beyond medicine which can only treat the physiological, not the metaphysical.

It is important to discuss at this point the body-soul composite of the human person, about how the two are related. Meyer summarizes what Thomas Aquinas and Aristotle understood:

> A mind must be present for an embryo or fetus to be truly human, and 'the soul requires a body that actually has the relevant organs' [read: the relevant *organization* (the soul does not exist 'before the body's *organization*'.)] Significantly, Aristotle and Aquinas denied that the human soul has a specific bodily organ, precisely because the soul forms or organizes the entire body.[14]

And the organization of the body cannot exist if the body itself does not exist. At the same time, "the very possibility of conceptual thought points to an immaterial soul that could not have emerged from matter all by itself",[15] and so Patrick Lee and Robert George write:

> Since we are not consciousness inhabiting bodies but are physical organisms possessing from the beginning a human nature (i.e., rational nature)… it follows that we came to be when these physical organisms came to be. And the science of embryology does determine when that occurs—namely, conception.[16]

The result is that both the individual human soul and individual human body become present at the same moment: the moment of conception (and even arguably from the instant of fertilization when sperm enters ovum). In the process of embryonic cryopreservation then, it is a human *person* that is being frozen. With an embryonic body (DNA, cellular integrity, activity and replication) rendered immobile, unresponsive to the soul's promptings to develop, what then distinguishes this cryostatic state of existence from the state it most resembles, that of death? If an organism is made unable to act, if its biological, chemical and enzymatic activities are made to cease indefinitely (even with the intention for later rewarming/resuscitation/revitalization), how does the cryostatic organism remain different from a deceased organism?

[14] Meyer, "Embryonic Personhood, Human Nature, and Rational Ensoulment," p. 218.
[15] Ibid.
[16] Patrick Lee and Robert P. George, "Dualistic Illusions," *First Things* 150 (2005), pp. 5-7 (7).

Being that this question has not yet been thoroughly addressed in ethics or in metaphysics, information and reflection regarding the cryostatic embryo's state of life is not only elusive, but too important to assume answered and self-evident, especially in the current climate of affairs with the culture encouraging most scientific research to disregard human dignity.[17] This question may even shed light on the ethics about aspirations for the vitrification of human adults for interstellar space travel, longevity, or other prospects requiring the prolongation of life.

To engage this concern, four natural biological states comparable to that of a cryostatic embryo will be explored: death, sleep, hibernation, and freeze-tolerance. In the medical field, clinical death is defined largely according to the absence of cardiopulmonary activity, as in blood pressure, circulation and respiration. The lack of pupil dilation is also a frequent indication of death. However, applied to the cryopreserved embryo, these medical definitions of death would declare *every* zygote to be dead, much less the cryopreserved zygote; yet to recognize the embryo as dead seems counterintuitive despite the organism's inability to provide a heart reading. Thus, the zygote's natural lack of any blood and organs make irrelevant and obsolete any conventional medical definition of death. Put another way: it is impossible to call an octopus mute if it naturally possesses no means of vocalization, it is impossible to claim a tree is deaf if it naturally possesses no faculty of auditory sensation, and it is impossible to declare an embryo (cryostatic or not) dead if our definitions concerning expiration are dependent on the operation of bodily organs naturally absent in those earliest stages of life.

However, cryogenic technicians do indeed have a means of recognizing embryonic expiration: cell death, which is apparent in the ordinary zygote when cellular activities cease and its cellular structures disintegrate. In the cryopreserved embryo, cell death is caused by

[17] For a thorough teleological argument for human embryonic personhood, see: Tim Mosteller, "Teleology, Embryonic Personhood, and Stem Cell Research," *Ethics and Medicine: An International Journal of Bioethics*, 21, 1 (Spring 2011), pp. 43-50.

extracellular and intracellular ice formation, dehydration, and solution effects that occur during the freezing procedure (embryos that survive freezing successfully are viable for up to 1000 years if sufficient conditions remain in place).[18] Cell death here is recognized when healthy levels of cellular fluids are excessively low or the composition and concentrations of chemicals in such fluids have been irreparably altered by ice formation within and around the zygote; ice formation itself is the most common cause of fatal damage to cell membranes and other cellular structures.

Sleep and hibernation at first may appear most similar to cryopreservation, but closer comparison reveals a subtle difference in status that separates these conditions more than unites: aging. In sleep and hibernation, the organism's biological processes are reduced to a slow progression, which aids in decreasing the aging of the organism, and aids in moderating the organism's metabolism and need for sustenance. While the organism sleeps or hibernates, the biological systems continue, though at a significantly reduced rate, whereas in cryostasis, the organism's aging is paused entirely. Arguably, this pause in activity and motion deprives the organism of its proper and ordinary biological development, which in turn prevents its *anima*ting principle (its first act, its life principle, its soul) from producing second acts (anything the organism does just because it exists) through its body – its matter. But does this deprivation by means of pausing or cessation via cryogenics also deprive the organism – specifically the human embryo – of life, and thereby of personhood?

At this point, it is important to recognize that not only does the fact that cell death can even occur affirm the cryostatic zygote must be alive in order to actually die by ice formation, but that the adaptation of freeze-tolerance in particular species of animals – such as frogs, turtles,

[18] P. Mazur, "Freezing of Living Cells: Mechanisms and Implications," *American Journal of Physiology* 247, 3 Pt 1 (1984), pp. C125–42.

salamanders and snakes[19] – is a strong indication that cryopreserved organisms, including human embryos, are not definitively deceased but remain alive as a composite of body and soul, albeit in a strange temporary state that has precedents in nature.

Speculatively, freeze-tolerance is possible and survivable partly because, though cellular activity has paused, atomic activity has not. The actuality and potentiality of the organism to live persists in cryostasis, but persists only in its atomic structures. This presence of mere atomic activity apparently is adequate to maintaining the being of the organism, preventing it from slipping out of existence – but not from preventing death, for even deceased organisms (corpses) are composed of active atomic structures. However, if an organism were subjected to cryostasis at the coldest known threshold – that of absolute zero (-273`C) – would the organism (or any matter, for that matter) be preserved or would it lose its actuality altogether? If a real being is metaphysically understood as something that has action – that can act on its own[20] – then if action is ceased altogether (even atomic activity), would the being disintegrate into non-being? Arguably, just because atomic activity is ended, the action of subatomic particles could continue and thereby maintain a thing's existence, however, what if *all* action is paused? It seems unreasonable to conjecture that the being would *disappear*, yet what remains more puzzling is the rewarming process' effects on the being: how do stopped or significantly slowed subatomic particles resume action? With momentum ineffectual and inertia in force, what will occur when a being is brought out of absolute zero and be [reasonably] assumed to resume its action? If the being was snuffed out of active existence, then where did its matter go (can this be called a sort of death?)? If the being persists through absolute zero and resumes its actuality and potentiality,

[19] Jon P. Costanzo, Richard E. Lee, Michael F. Wright, "Glucose loading prevents freezing injury in rapidly cooled wood frogs," *American Journal of Physiology* (1991), pp. R1549–R1553 (R1549).
[20] W. Norris Clarke, *The One and the Many*, (Notre Dame: University of Notre Dame Press, 2001), p. 31.

then from what source (if not its soul) does it derive its restarted action? A tumbling stone that is stopped does not resume tumbling without the application of some external force.

Applied to the cryopreservation of human embryos, and since the rewarmed zygote indeed does resume its development and life processes, then it must be that its immaterial soul is reinvigorating its material being without ever having separated from the body. In other words, the human soul was perpetually present along with the successfully cryopreserved embryonic body; the soul merely required the body's rise from cryopreservation before the soul's life processes could be manifest once more, in sync with and in the flesh. It is important also to recognize that the soul relies on the embryonic body's integrity in order to remain present with the embryo; if the embryo is mortally wounded (i.e., by ice formation), the soul and body would separate as in usual death and the reinvigoration of the embryo would be impossible. This conclusion offers yet another sign of the soul's necessary existence in organisms: without an animating principle that is independent of the material body (and thus also unaffected by all manipulations forced upon the material), any change to the body would also alter the soul's agency. However, we see this cannot be the case since even if a body's entire collection of living processes cease in successful cryopreservation, its soul is most prompt at reanimating its living system upon the body's adequate thawing. If this were not the case, then successful cryogenics would be impossible and freeze-tolerance would be death-dealing.

Now, with the personhood of the cryopreserved embryo defended and defined as an unrepeatable human embryo under the suspended animation of a unique, rational human soul (the only soul fit for a human being, as only a gecko-soul is fit for a gecko-body), we can proceed in the direction of ethics toward the treatment and revitalization of these snow children.

--- 3: Personhood Unpaused: Saving the Snow Children ---

With the question of life and personhood for the human cryopreserved embryo now clarified, we move from the metaphysical discussion to that of ethics: how ought cryopreserved embryonic persons to be cared for in their state, and does there exist a dignified means to bring them out from their deprived condition into that of an ordinary human life experience?

In recent discussions regarding the rescue of cryopreserved embryos from their *absurd fate*,[21] two proposed solutions seem most promising, and one ethical factor appears to be overlooked. The factor of *ordinary means of care* and *extraordinary means of care* is frequently applied to moral decisions pertaining to those persons in extreme medical conditions and treatments such as life support, breathing assistance and persistent vegetative state. However, must this means-of-care factor be restricted only to such end-of-life cases? Can it not also be relevant to embryos in cryopreservation, which is arguably an extreme medical condition itself? Thus, not only is the cryogenic process dangerous to both technicians and embryos, but it is also laborious and expensive, and the long term maintenance of cryostorage facilities and equipment is even more so.[22]

As a whole, the cryopreservation process appears to easily qualify as extraordinary (or disproportionate) in means of care, by which "we mean all medicines, treatments, and operations, which cannot be obtained or used without excessive expense, pain or other inconvenience, or of which, if used would not offer a reasonable hope of benefit."[23] Yet, if the mere maintenance of

[21] D. Brian Scarnecchia, *Bioethics, Law, and Human Life Issues*, (Plymouth, United Kingdom: Scarecrow Press, 2010), p. 177.
[22] Standard requirements of successful cryopreservation, costs and the overview of the process can be found here: Eleonora Porcu, Patrizia Ciotti, and Stefano Venturoli, *Handbook of Human Oocyte Cryopreservation* (Cambridge: Cambridge University Press, 2012).
[23] Daniel A. Cronin, *Ordinary and Extraordinary Means of Conserving Life*, (National Catholic Bioethics Center, 2011), p. 159.

cryopreservation is deemed extraordinary – and thereby not ethically mandatory – how does the resultant death of the cryopreserved embryo differ from an abortion? One could explain that an abortion views the life of the unborn child as not worthwhile; however the ethics of means-of-care does indeed view all human life as worthwhile, but instead merely deems the extraordinary mean of care as not worthwhile, and thus not constituting murder even if the absence of such procedure is responsible for death.[24] In other words, abortion violates the moral obligation of those involved to care for the child because gestation, birthing, and nurturing are merely ordinary means of care, whereas the expiration of neglected cryopreserved embryos may not violate any ethics since the maintenance (and even the thawing, adoption and implantation) of the embryo can be deemed extraordinary in means of care. Furthermore, the present lack of an ethical, safe, and dignified means of bringing cryopreserved embryos out of storage and into a family seems to equate as a lack of reasonable hope of benefit, and thereby renders even the continued storage of frozen embryos as extraordinary. So, with the ethics of means-of-care applied to the cryopreserved embryo, it seems then that the disposal or eventual expiration of these embryos is justifiable and perhaps even necessary![25] Yet this conclusion is understandably disturbing, knowing that the embryos are indeed human persons. Therefore, more work must soon be done in ethics to define the difference of application regarding means-of-care to end-of-life issues and start-of-life issues. If no distinctions can be found and made, then we may eventually see the tragic discarding of many human persons.

Yet, if indeed distinctions are found, then according to D. Brian Scarnecchia, the most optimal proposed solution to rescue frozen embryos involves homologous embryo transfer: that

[24] Janet E. Smith and Christopher Kaczor, *Life Issues, Medical Choices: Questions and Answers for Catholics*, (Cincinnati: Servant Books, 2007), p. 110-111.
[25] William E. Stempsey, S.J., "Heterologous Embryo Transfer: Metaphor and Morality," in *The Ethics of Embryo Adoption and the Catholic Tradition*, vol. 6, eds. Sarah-Vaughn Brakman and Darlene Fozard Weaver (Springer Science, 2007), pp. 25-41 (39-40).

of implanting the thawed and prepared embryo into the womb of the embryo's own genetic mother. His conclusion is worth quoting at length:

> In attempting homologous embryo transfer spouses seek to save the life of the child they put in jeopardy while, at the same time, safeguarding their child's dignity by reuniting the genetic, gestational and rearing dimensions of its parentage. Embryo transfer that works no separation of genetic and gestational parentage does no further dishonor to the embryo or the spouses than has already occurred through in-vitro fertilization. The child who enters the womb through homologous embryo transfer commits no trespass, a child who in its flesh unites its parents as… procreators.[26]

> Although they [the parents] are not the instrumental cause of her [the woman's] pregnancy, the spouses remain the efficient material cause of the conception and birth of their child. At times the instrumental cause of birth or pregnancy may be transferred to third parties without offending the dignity of marriage as in the cases of caesarean birth, or the impregnation of a woman with her embryo transferred from the site of an ectopic pregnancy.[27]

However, there appears to be a lapse in judgment in the second paragraph where it states cases of licit transference of pregnancy by third parties. Scarnecchia's examples of caesarean birth and the correcting of an ectopic pregnancy involve cases during *ongoing* pregnancy, whereas embryo transfer itself of any kind (homologous or heterologous) *commences* pregnancy. What results are weak analogies to exemplify the ethical justification of homologous embryo transfer. Instead, the distinction must be acknowledged between medical procedures occurring *during* pregnancy from those that *initiate* pregnancy, and it must be argued that the extracorporeal in-vitro fertilization of the embryo itself had already begun the pregnancy process and established the motherhood and fatherhood of the couple, as it is indeed argued thoroughly by Elizabeth B. Rex:

> … impregnation and biological parenthood are genetically established at fertilization, not at implantation or following an embryo transfer.

> In other words, impregnation scientifically occurs at the moment the mother's ovum is fertilized by the father's sperm. Implantation, on the other hand, scientifically happens *after* impregnation, either naturally or following embryo transfer… Why is this distinction important? Because each and every human embryo is a child from its conception. A mother is "with child" not when the human embryo is transferred into the woman's womb, but when it is conceived, either in the fallopian tube or in vitro. In fact, a married couple who create twenty embryos in vitro are already parents "with child" (twenty children to be exact). If three of the embryos are transferred to the

[26] D. Brian Scarnecchia, *Bioethics, Law, and Human Life Issues*, p. 179.
[27] Ibid., 178.

> mother's womb and seventeen embryos are frozen, they are still the parents of twenty children. If none of the three transferred embryos implant, the parents will still have seventeen more embryonic children who are frozen and stored in liquid nitrogen.[28]

Furthermore, Rex continues and defines IVF and embryo transfer as not both immoral, that though the two acts are closely connected, the two procedures remain acts "entirely separate and distinct… [each] with its own morality."[29] Although in-vitro fertilization is intrinsically unethical,[30] embryo transfer itself and in isolation is – in that it concerns actual embryonic persons already conceived – merely a medical attempt to fulfill the moral obligations of adoptive parents (and I suppose of genetic parents also) toward their adopted (or genetic) child.[31] What is important to note here is that the adoption of the embryonic child by its non-genetic parents must occur *after* conception and not before, otherwise what may result is a case of surrogacy (which too is intrinsically unethical).[32]

Yet, Rex's moral distinctions between IVF and embryo transfer, and her clarification of the difference between impregnation and implantation, lead us to the justification of the next possible solution of rescuing cryopreserved embryos: heterologous embryo transfer (implanting the thawed and prepared embryo into the womb of a woman who is *not* the embryo's own genetic mother). To Rex, once the child is conceived, embryo adoption and transfer is then licit whether it be homologous or heterologous. Whereas some moralists (i.e., William E. May, Helen Watt, E. Christian Brugger, Robert George and Germain Grisez) concur, other bioethicists (i.e.,

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[28] Elizabeth B. Rex, "IVF, Embryo Transfer, and Embryo Adoption," *The National Catholic Bioethics Quarterly*, 14.2 (Summer 2014), pp. 227-234 (231).
[29] Ibid., 233.
[30] For further information regarding the practices surrounding IVF, please see these three documentaries:
Eggsploitation. DVD. Directed by Jason Baird and Jennifer Lahl. (Pleasant Hill, CA: Center for Bioethics and Culture, 2010).
Anonymous Father's Day. DVD. Directed by Jennifer Lahl and Matthew Eppinette. (Pleasant Hill, CA: Center for Bioethics and Culture, 2011).
Breeders: A Subclass of Women? DVD. Directed by Jennifer Lahl and Matthew Eppinette. (Pleasant Hill, CA: Center for Bioethics and Culture, 2014).
[31] Rex, "IVF, Embryo Transfer, and Embryo Adoption," p. 232.
[32] Ibid., 228.

William B. Smith, Edmund Pellegrino, Taduesz Pacholczyk and Nicholas Tonti-Filippini) disagree with Rex and claim that both homologous and heterologous embryo transfers are illicit. In this debate however, the main concerns against embryo transfer is the surrogacy[33] and marital infidelity involved.

Where Scarnecchia easily addresses and answers both concerns in his advocacy for *only* homologous embryo transfer (as discussed above), Rex's expansive advocacy for *both* homologous and heterologous embryo transfer (since she does not distinguish between the two), based on the distinction she details between impregnation and implantation, is in need of further qualification in regards to specifically heterologous transfer where:

> … both the impregnation and the legal adoption of the frozen embryo by the adoptive parents take place *prior* to the transfer of the adopted embryonic child into the womb of the adoptive mother. Therefore the adoptive parents are already the legally responsible parents of the legally adopted child(ren) *before* the embryo transfer takes place. Thus, embryo transfer is not ordered per se to "impregnation… outside of the bond of marriage," but rather to saving the life of a legally adopted child by the legally responsible adoptive parents within the sacred bond of their marriage and marital life.[34]

Rex's careful qualification for heterologous embryo transfer is thus not a clear case of marital infidelity or surrogacy because the mother has no intention or "pledge to surrender the baby once it is born to the party who commissioned or made the agreement for the pregnancy."[35] In sum, it seems that the only justification for heterologous embryo transfer is if:

1) the genetic mother (and genetic father?) of the embryo is dead or permanently unable to care for the child, and

[33] Of the various violence surrogacy inflicts on children and parents, perhaps the most subtle and devastating is that of the *primal wound*: gestation for the child bonds her intimately to her gestational mother (genetically related or not) and the separation of the child from this mother causes deep confusion and crisis for the child who psychosomatically anticipates this gestational mother to remain her mother. For more, see:
Breeders: A Subclass of Women? DVD. Directed by Jennifer Lahl and Matthew Eppinette. (Pleasant Hill, CA: Center for Bioethics and Culture, 2014).

[34] Rex, "IVF, Embryo Transfer, and Embryo Adoption," p. 232.

[35] Scarnecchia, *Bioethics, Law, and Human Life Issues*, p. 151.

2) the adoptive mother is able and fully intends to provide the child with her maternity and with the paternity of her husband, and
3) the adoptive parents are not acting as surrogates in any way, and had no role in the fertilization and cryopreservation of the embryonic child.

Yet, bioethicists must reflect closer on whether or not these careful qualifications really do make heterologous embryo transfer ethical. Rex, it appears, has uncovered a seemingly legitimate yet overlooked and unexplored loophole.

And if heterologous transfer were deemed ethical, this would then bring us to the third possible means of rescuing cryopreserved embryos: the voluntary gestation of embryos by a religious order of consecrated sisters established exclusively for this mission.[36] However, as admirable, generous, selfless and daring as this solution may sound, it is important to note its extensive and inherent shortcomings:

A) Since consecrated sisters take vows of celibate chastity and therefore refrain from marriage, this subjects the child to be fatherless and subjects the sister to single motherhood, both situations of which are unjust and disrespectful to the dignity of the woman and child.
B) Also, if the sisters offer their children up for adoption, then the situation of surrogacy occurs, and the use of their wombs and bodies as gestational equipment is an inexcusable offense to the women's dignity.
C) If the consecrated sisters in this religious order take it upon themselves as their mission to gestate these embryonic children, then this mission could be found to be a

[36] Andrea Kirk Assaf, "The absurd Fate of Frozen Embryos: Interview with Law Professor Brian Scarnecchia," *Zenit*, February 25, 2010, accessed November 19, 2013, http://www.zenit.org/en/articles/the-absurd-fate-of-frozen-embryos.

form of coercion placed upon the women to bear these children, which violates their free will and is another sign of surrogacy.

D) Finally, out of justice due to the child, the woman who bears the child must be the genetic or adoptive mother who is able and fully intends to provide the child with her maternity (and not be a mere volunteer gestational carrier)[37] and with the paternity of her husband. Thus, the consecrated sister – in desiring this mission of bearing and rearing abandoned embryos – should not pursue religious life and should instead fulfill her mission in a sound marriage which would provide the born child with a natural family consisting of a mother and father who love her and each other.

Points A and D do not fulfill the first and second qualifications of family life[38] that may legitimize heterologous embryo transfer as clarified by Rex above, whereas points B and C violate the third qualification as a case of surrogacy. Altogether, the points made show clearly the illicitness of a religious order of consecrated sisters in pursuing heterologous embryo transfer even if the procedure were determined ethical, despite the goodness and charity the sisters seek to provide.

Lastly, we address the utilization of artificial incubators or animal wombs as possible means to rescue cryogenically preserved embryos. The concern here, though it does well to remove the abuse of surrogacy, does so with violence to the humanity of the child and deprives her of an interpersonal and intimate human relationship with her mother and father. In human surrogacy, the woman's womb and body is viewed as a mere instrument or mechanism to produce children. Her dignity and the dignity of motherhood are overlooked and

[37] The phrase *gestational carrier* is a euphemism that dehumanizes the woman involved in surrogacy. For more, see:

Breeders: A Subclass of Women? DVD. Directed by Jennifer Lahl and Matthew Eppinette. (Pleasant Hill, CA: Center for Bioethics and Culture, 2014).

[38] Points A and D also reveal the overlooking of the necessity of fatherhood in the lives of families and children.

unacknowledged as unique and irreplaceable, as well as essential for the child and mother: "being pregnant affects the psychosomatic being of a woman: it alters her identity. Maternity is not something a wife *does*, like breast feeding; rather, she *is* pregnant."[39] Catherine Althaus elaborates further:

> As with conception/fertilization, pregnancy is not a mere organ donation. It effects a profound metaphysical change in the woman, the man, and the child. While conception/fertilization grants life to the child and makes the woman and man parents, pregnancy is part of the procreative process because it uniquely:
>
> 1. Develops the woman as a mother
> 2. Sustains and develops the life of the child
> 3. Sustains the paternity of the father[40]

Therefore, animal or artificial surrogacy violates the woman and child's dignity even further. Not only does the use of alternate, non-human wombs actually reinforce the belief of women as replaceable incubatory instruments, but it also exiles the child to an alien, uninvolved, literally inhuman environment when she most relies on the familial, familiar and intimate environ of her mother (genetic or not) for her growth, development and life. Every objection there is against human surrogacy is only amplified by animal or artificial surrogacy. If there is to be any separation of a human child from humanity, let it be tolerated later in life after birth and not at the child's very earliest and most vulnerable age when her maturing is most plastic, dependent and receptive to her mother's perpetual presence. Increasing research on life before birth demonstrates the essential life experience of pregnancy for the child, mother and father.[41] And we must beware that:

> … too much emphasis can be given to the biological or corporeal means of initiating and nurturing new life to the neglect of spiritual parenthood and childhood. Yet in the rush to uphold

[39] Scarnecchia, *Bioethics, Law, and Human Life Issues*, p. 174-175. See here also for an excellent argument against heterologous embryo transfer, though it does not address Elizabeth Rex's loophole legitimizing it.
[40] Catherine Althaus, "Human Embryo Transfer and the Theology of the Body," in *The Ethics of Embryo Adoption and the Catholic Tradition*, vol. 6, eds. Sarah-Vaughn Brakman and Darlene Fozard Weaver (Springer Science, 2007), pp. 43-67 (65).
[41] In the Womb. DVD. Directed by Toby Macdonald. (Washingon D.C.: National Geographic Video, 2006).

> human dignity we cannot forget that humans are a unified totality of corporeal-spiritual reality and that to in any way rupture this integration is to deny human beings of their humanity.[42]

Arguments for gestating embryos in animal, artificial, or human surrogate wombs as lesser evils are also ineffective, for ends never justify means. We must remember that the end good of bringing a child out of cryopreservation is not an excuse to use any means possible to do so, just as because it is good for a child to result from a conjugal act does not mean any means should be pursued to make it so (e.g. rape, incest, IVF, surrogacy, etc.).

However, a distinction must be made here concerning complete ectogenesis [CE] and partial ectogenesis [PE]. CE is the extracorporeal process of fertilizing, gestating and birthing a child without the child experiencing any meaningful and developmental progress within her mother's womb. This process of complete ectogenesis is easily ranked along other immoral practices such as human cloning and in-vitro fertilization, whereas the child in partial ectogenesis includes *some* reliance and meaningful developmental progress within her mother's womb – very much like the lauded and advocated use of incubators or neonatal care units for the premature.[43] It is easy to conclude here that so long as the vital human interaction between mother, father and child is not entirely supplanted or suppressed by machine (i.e., CE), then the use of PE in reviving and nurturing cryopreserved embryonic children is arguably acceptable, though how extensive PE use should be before it deprives the mother, father and child of this vital gestational interaction is not so easy to conclude.

In advocating for PE though, it is important to understand that the entire gestation experience of mother, father and child is irreplaceable and pivotal in the humanity of the family. As explained above, the development of the child in utero has great nurturing influence that is

[42] Althaus, "Human Embryo Transfer and the Theology of the Body," p. 65.

[43] Christopher Kaczor, "Artificial Wombs and Embryo Adoption," in *The Ethics of Embryo Adoption and the Catholic Tradition*, vol. 6, eds. Sarah-Vaughn Brakman and Darlene Fozard Weaver (Springer Science, 2007), pp. 307-322 (309-310).

merely beginning to be uncovered by research, and that the relationship between the woman, man, and child involved undergoes profound metaphysical and spiritual transformation into motherhood, fatherhood, and childhood. With that said, it would be only barely tolerable and far from ordinary to accept the use of PE, much less to see it as something to be promoted as Christopher Kazcor seems to think in his thought experiment, which must first be quoted at length:

> Consider this thought experiment. What if instead of considering the use of highly advanced incubators in lieu of abortion, we had discovered an injection that sped up the time of gestation'? Rather than 9 months of pregnancy, a woman who received this injection would be able to give birth to a full-term, perfectly healthy baby 9 min later. Suppose further the injection was equally risky for mothers and their babies as normal childbirth - that is to say not absolutely risk-free but well within reasonable parameters. Would use of such injections be condemned as intrinsically evil by the Church? I think the answer would be no. Although the injections would hardly be natural, they are no more contrary to nature than pain medication to ease the agony of labor. Rather than enduring morning sickness, interruption of educational or work schedules, and other hardships associated with 9 months of pregnancy, women would be able to forego these difficulties, if they choose, given due consideration for all the goods involved, especially the well-being of the child in question. Women who might otherwise choose abortion rather than adoption (due to the long months of bonding with the child making adoption after extremely difficult) would be able to place their baby with another family before extensive bonding developed. Those who would choose abortion out of shame could speed up the gestation and deliver before anyone found out. Rape victims would not have to be reminded for 9 months of their sexual assault. Women would be helped; children would be preserved. These considerations apply equally well to the use of artificial wombs as an alternative to abortion. Whether such an injection would be permissible in typical situations of pregnancy is another question. Whether such an injection would also be permissible to "speed up" other stages of human life such as infancy or childhood is still another question. There are goods intrinsic to the practices of bearing or raising children as well as being raised as a child in a normal way. Needless to say, there are also serious questions and perhaps insurmountable obstacles to developing such an injection in a morally permissible way. However, there are very few, indeed extremely few, classes of actions (e.g., murder, adultery, perjury, apostasy) that are deemed by the Church as intrinsically evil, and it is hard to see why an injection speeding pregnancy would fall into the category of things never to be done no matter what the consequences. Like placing a newborn or an older child for adoption, in my opinion it would not be intrinsically evil and nevertheless should not be lightly chosen.
>
> … Likewise, the artificial uterus is no more ominous than highly advanced versions of the neo-natal intensive care units widely used today to save the lives of thousands of premature infants.[44]

Kazcor severely overlooks or underestimates a few points in his accelerated pregnancy thought experiment. First, he claims that though such an accelerated pregnancy injection [API] is hardly

[44] Ibid. p. 320-321.

natural, it is no more contrary to nature than anesthetics to alleviate labor pain. However, there appears to be significant differences that disqualify the analogy: anesthetics interfere with the physiological response and sensitivity of the nervous system so as to veil us from pain and not to eliminate the true cause of the pain, whereas this API altogether is not veiling anything, but is actually acting as a kind of enzyme, a catalyst that accelerates gestation, aging, and finally induces birth. The nine months of pregnancy is reduced to nine minutes.

Already apparent is the loss of time to nurture a bond between mother, father and child. Relationship and intimacy take a certain duration and proximity to set, and to reduce this most intimate time to mere minutes is a deprivation to the family. Given that Kazcor's analogy is addressing an alternative to abortion (specifically the use of artificial wombs to prevent abortion), even if mother and father reject the child, should API be applied at the benefit of the parents, but at the deprivation of the child, at depriving her of a human intimacy that all human persons enjoy?

Kazcor also touts that API (may be read *artificial wombs* or *PE*) may help prevent *extensive bonding* so as to ease the surrender of children up for adoption and therefore, save them from abortion. The question here is why should extensive bonding be prevented, as if it were bad? Would not the better case be that a woman who contemplates abortion, realizes her extensive bond with her child and is then moved to embrace life rather than to rid it, whether through abortion or adoption (her misuse of adoption as a means to dismiss her child)? Kazcor's other selling points for API (again, may be read as *artificial wombs* or *PE*) are also unconvincing, in that they echo the excuses behind abortion advocacy: hiding pregnancy to prevent shame (without helping heal from the shame), eliminating pregnancy from victims so as to spare them from reminders of sexual assault (without healing from the assault), and allowing women to live more convenient lives at the sake of another. This oversight by Kaczor is particularly disturbing

since all such points are in turn used as excuses to coerce women to choose abortion. And so, are we to see coercion in the use of artificial wombs?

Yet, though Kaczor acknowledges that the abuse of artificial wombs is very possible, and rightly that abuse does not illegitimize it,[45] he fails in the context of his analogy to address the greatest abuse against the child: her being deprived of the natural nine months of bonding and intimacy with and in her mother's person. To be clear, the amount of time passed in natural gestation before legitimate use of PE is yet to be determined by the proper professionals, but to exaggerate and set that time to a mere nine minutes is unhelpful, even as an analogy. In medical practice today, the amount of time spent in natural gestation before possible PE use is set by the extent of technological abilities, but as Kaczor says, such a limit may be significantly lowered as technology improves. Therefore, his choice of nine minutes may be feasible, but should it be enough for the good of mother, father and child? Is such a short time before PE even enough to differentiate it qualitatively from complete ectogenesis? It would seem not.

Finally, Kaczor does not address whether the end good of bringing a child out of cryopreservation is enough an excuse to use any means possible to do so. As stated earlier, just because it is good for a child to result from a conjugal act does not qualify that any means should be pursued to make it so (e.g. rape, incest, IVF, surrogacy, etc.), and that not any means should be utilized to preserve it (i.e., cryopreservation, complete ectogeneis, or even partial ectogenesis that is almost indistinguishable from CE). In fact, returning to the ethics and application of ordinary and extraordinary means of care, would not PE qualify as an extraordinary means of care? Kaczor himself admits that "at present saving these children [via artificial wombs and PE] is very expensive and many of them become seriously disabled…"[46] It appears then that even

[45] Ibid. p. 321.
[46] Ibid.

though such techniques to save the lives of these premature children is morally acceptable, it remains to be determined whether the techniques are morally worthy of promotion and can measure up to respecting the dignity of the human person from the embryonic stage.

--- 4: Conclusion ---

Many concerns have yet to be addressed and adequately studied and thought through. However, the personhood of the human embryo, cryopreserved or not, is demonstrable not only by metaphysics, but also by honest science. With this knowledge of the human person then, it is necessary to discern an ethical means of treatment toward the embryo and the cryopreserved embryo. Needless to say, the continued practice of IVF should cease in order to prevent further violations to the persons involved (mother, father, children), or that IVF should at least be better regulated (as is already the case in Italy, and in Germany the embryo is legally recognized as a person)[47] by proper authorities and governments responsible for its citizens – embryonic citizens included.

The solutions proposed and currently utilized to rescue cryopreserved embryos continue to be debated and discussed, and loopholes and oversights must be studied to guard against further abuses or to reveal and justify solutions previously thought to be unacceptable. The natural desire to procreate human life and the desire to save it, though good, are never justifications that demand and validate any means to achieving each goal. The means must match the measure of man's dignity. Nevertheless, in the discussion of rescue, it is not embryo adoption,

[47] Elizabeth Cason Crosby Cheely, "Embryo Adoption and the Law," in *The Ethics of Embryo Adoption and the Catholic Tradition*, vol. 6, eds. Sarah-Vaughn Brakman and Darlene Fozard Weaver (Springer Science, 2007), pp. 275-306 (300-306).

but rather adoption of embryonic children that must be discerned. The snow children, in their patient and waiting state, have already caused us to seriously discuss and understand not only their personhood, but to understand ours as well. Yet it remains to be known how much more would they contribute to human life if they had been left to live with us and not forced to freeze.

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