

nucleus. Therefore, transcription factors already present in the cytoplasm of the female oocyte can activate or suppress coding genes after fertilization or cloning. This is why they are also referred to as epigenetic factors. The *Cdx2* gene regulates transcription factors. Down-regulation of *Cdx2* in the female oocyte before DNA transfer results in an entity incompatible with human life because the missing transcription factors cannot turn on the genes for embryogenesis. To claim, as Peterson does, that ANT produces "an entity which functions as an embryo ..." is therefore misleading. Embryos by definition are multicellular organisms with the capacity to independently develop into a complete, integrated, living being.

What we most want to learn from Peterson about the morality of ANT is veiled in clouds of agnosticism. Because Peterson insists on using the term "embryo" or "embryo-like" whenever he refers to the product of ANT, he misplaces the burden of proof on those who would either affirm or deny that an embryo is a human person. Since ANT does not produce an embryo, the proper moral consideration is whether it is ethically acceptable to manipulate the human genome through nuclear DNA transfer. About this question Peterson has little to say. Indeed, Peterson's moral and biological equation between ANT and SCNT raises serious questions about his moral judgment on this issue. His pragmatic conclusion that "SCNT may meet the same moral concerns [as ANT] with fewer technical challenges" depends on what he means by "technical challenges." While it is true, as Peterson claims, that animals cloned from adult donor cells rarely survive to live birth after implantation, there is a small technical problem with the approximately 4% who do survive. If Peterson really finds SCNT morally equivalent to ANT because it has a low probability of producing life, it would seem more prudent to prefer a procedure that is utterly incompatible with the production of living beings.

Where Peterson is certain, I find perplexity. According to Peterson, the Bible does not establish the point at which individual life begins (p. 297). However, the Gospel of Luke is absolutely clear that Jesus Christ's human life began at conception. While Peterson states that Luke's birth narrative "does not tell how far along Mary was in her pregnancy" (p. 297) when Elizabeth greeted her as "the Mother of My Lord" (Luke 1:42), the chronology is very specific. The annunciation came to Mary "in the sixth month" of Elizabeth's pregnancy (Luke 1:26, cf. 1:24, 36). After the annunciation, Mary made the four-day journey from Nazareth and stayed with Elizabeth "about three months" (Luke 1:56) before John was born. Jesus' personal existence, therefore, coincides with the annunciation, as Mary's question, "How can this be ..." (Luke 1:34) makes clear. Mary's question is also the reason for my perplexity. Where did the other twenty-three chromosomes come from? Is the virgin birth analogous to modern cloning? If so, what are the moral criteria for human cloning and genetic engineering?

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## Peterson's Response to McCallum

First, thanks to J. Bruce McCallum for taking an interest in my article. That is appreciated. I am puzzled by his statement that "Peterson insists on using the term 'embryo' or 'embryo-like' whenever he refers to the product of ANT." Actually, there is no instance in the article where the product of ANT is referred to as an embryo. The one reference where the product of ANT is referred to as "embryo-like" is citing a proposal and the language of Paul McHugh. The word that the article does use throughout for the product of ANT is "entity." The word entity was deliberately chosen out of deference to scholars who are convinced that the product of ANT is not an embryo.

He also charges that I am not able to tell the biological difference between the products of ANT and SCNT. Of course, I do not claim that ANT and SCNT are identical procedures, nor that they have identical results. I did note that each has been touted as a way to produce an entity which can provide pluripotent stem cells without the death of a viable embryo. Whether either succeeds to that end and is morally preferable in how it does so, depends largely on one's definition of embryo and on the moral status of an embryo if one is present.

It is the latter question that is the focus of my article. On the moral status of the embryo, McCallum proposes that the first chapter of Luke is already "absolutely clear" about this. For McCallum, because Elizabeth calls Mary "the Mother of my Lord" four days after the annunciation, Jesus must have been fully present, hence all embryos are fully present persons. Actually, what Elizabeth says to Mary is that Mary will in the future bear a blessed child. Far from hailing the immediate presence of the Messiah, Elizabeth hails the mother of a very important child in the future. There is no statement in this text that Mary is pregnant at that moment. Now Elizabeth does use the phrase "the Mother of my Lord" (a confirmation undoubtedly much to Mary's encouragement), but that title does not tell us that the Holy Spirit had already created the start of the life that would be Jesus or that the Second Person of the Trinity was already incarnate inside Mary at that moment. God's promises are so sure that they are often stated in the Bible as if already accomplished before they chronologically take place. For example, God directed Abram to be called always "Abraham," which means the Father of Multitudes, on the basis of God's trustworthy promise a year before he and Sarah had even one promised child, let alone a multitude (Gen. 17:5, 21). A biblical title can mean that a referenced event is sure to happen, not necessarily that it already has happened.

In sum, the Luke text does not describe precisely when or how the Holy Spirit establishes the Incarnation, let alone that all human beings are fully present persons from conception. As stated in my article, there are no biblical texts that tell us that a person, a soul, is fully present from conception. Arguments to support that particular conviction will have to come from personal revelation, tradition, reason, or some other extra biblical source.

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