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## WHAT DOES IT MEAN TO BE HUMAN?

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### SYNOPSIS

Debates over embryonic stem cell research and human cloning have forced us to address the question: What does it mean to be human? If embryos are intrinsically valuable as human beings, then embryonic stem cell research and human cloning are problematic, for both involve the instrumental use of human embryos, and if postnatal children are employed, that would be clearly immoral.

The facts concerning embryology and fetal development support the argument that an individual human being, with its own genetic code, comes into existence at conception and remains the same human being throughout its lifetime to adulthood. Some object that twinning proves that an individual human being does not begin at conception. Their objection is faulty, however, because early embryonic cells function as parts of a single organism even though they are unspecialized and have the potential to become another being if separated. Others object that the preborn, while human, are not intrinsically valuable because they lack certain presently exercisable capacities. This argument, however, cannot account for clearly valuable human beings, such as those who are asleep, unconscious, or comatose and who also presently lack certain capabilities; moreover, if intrinsic value is based on the degree of capabilities, then it cannot account for equality among human beings since some have more capabilities than others (e.g., the ability to reason).

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Recent debates over issues such as embryonic stem cell research and human cloning have brought to the forefront the question: *What does it mean to be human?* After all, in order to establish important findings in stem cell research and to perfect human cloning, literally thousands of human embryos must be brought into existence for the sole purpose of experimenting on them, only to discard them later. In fact, some members of the U.S. Congress who want to ban cloning for reproductive purposes support cloning for research purposes in order to create an available supply of stem cells (among other reasons). This recommendation would put the government in an unusual position if it were to become law: it would require researchers to treat embryos as instrumentally, rather than intrinsically, valuable human beings by directing them to *kill these embryos* or risk facing hefty fines or imprisonment. Unlike the abortion right, which only *permits* the killing of embryos, this law would *require* it.

It is now more important than ever to think through what it means to be human. In this article I will argue that a human being begins to exist at conception and that what makes that human being intrinsically valuable is not that it has the *present capacity* to perform functions we typically associate with intrinsically valuable human beings (IVHBs), but that it has the *nature* of a moral agent that grounds its capacity to perform these functions. In other words, each human being, regardless of his or her level of development, is entitled to all the rights to which equal moral agents are entitled by virtue of being an equal moral agent. If it is wrong, for example, to kill a 10-year-old child in order to take her kidneys and give them to people the government thinks will benefit society (e.g., scientific geniuses on the verge of

curing cancer or AIDS), it is also wrong to kill a 20-week-old fetal-clone for the same purpose since they are equal moral agents.

### WHEN DOES A HUMAN BEING BEGIN?<sup>1</sup>

A human being begins its existence at *conception*, which occurs when the male sperm and the female ovum combine; in other words, fertilization is a process that culminates in conception. The result is an entity called a *zygote*. It is a misnomer to refer to this entity as a “fertilized ovum,” because both ovum and sperm, which are genetically parts of their owners (mother and father, respectively), cease to exist at the moment of conception. For this reason, it may not even be correct to refer to the sperm and egg as “uniting,” for, as philosopher Robert Joyce points out, this “suggests that they remain and form a larger whole.” They are not like machine parts, which, when added together, form something larger though remaining identifiable parts; rather, as Joyce argues, “the nuclei of the sperm and ovum *dynamically interact*,” and “in so doing, they both cease to be. One might say they die together.”<sup>2</sup>

There is no doubt that the *zygote* is biologically alive, and, as the facts reveal, this life is an *individual human life*. First, the *human conceptus*, that which results from conception and begins as a *zygote*, is the sexual product of *human* parents. Insofar as it has human causes, therefore, the conceptus is human. Second, it is a human individual. The conceptus resulting from the union of a female ovum (which contains 23 chromosomes) and a male sperm (which contains 23 chromosomes), is a new, although tiny, individual with its own genetic code (with 46 chromosomes),<sup>3</sup> which is neither its mother’s nor its father’s. The “genotype” — the inherited characteristics of an individual human being — is in place at conception, and it plays the same role in the human organism as it does in all living organisms: it has highly complex information that instructs the unfolding of the organism’s intrinsic potential.<sup>4</sup> This genotype, of course, will remain with that organism as long as it exists. The only thing necessary for the organism’s growth and development, as with the rest of us, is oxygen, food, water, and healthy interaction with its environment, since this organism, like the newborn, the infant, and the adolescent, needs to develop only in accordance with its already designed nature, which is present at conception.

From a strictly scientific point of view, therefore, each human being begins its physical existence as a *zygote*, and it remains a human *being* throughout its life, from *zygote* to *embryo* to *fetus* to *newborn* to *adolescent* and throughout *adulthood*. None of these stages imparts to the human being its humanity.

Cell division occurs after the *zygote* stage. The human conceptus increases to over 100 cells within the first seven days after conception, and *implantation* occurs between seven and nine days, at which time the conceptus “nests” or implants in its mother’s uterus. During this time, and possibly up to 14 days after conception, the conceptus may split, resulting in the creation of identical twins.<sup>5</sup> In some instances, the two conceptuses may recombine and become one conceptus. The “primitive streak” — the spine’s ancestor — appears between days 12 and 17. At about three weeks a primitive heart muscle begins to pulsate. Other organs begin to develop during the first four weeks, such as a liver, umbilical cord, kidneys, and a digestive tract (albeit in their primitive forms). This organism has a head with a developing face and with primitive ears, mouth, and eyes. The fourth week ends with a fully formed human embryo.<sup>6</sup> “After the eighth week no further primordia will form; *everything* is already present that will be found in the full term baby....From this point until adulthood, when full growth is achieved somewhere between 25 and 27 years, the changes in the body will be mainly in dimension and in gradual refinement of the working parts.”<sup>7</sup>

Given the facts of embryology and fetal development, clearly an individual human organism, with its own genetic code, comes into existence at conception, needing only food, water, shelter, oxygen, and a congenial environment in which to interact in order to grow and develop in accordance with its own intrinsically ordered nature. The conceptus, like the infant, the child, and the adolescent, is a being who is in the process of unfolding its potential; that is, the potential to grow and develop itself but not to change what it is. The same human being that begins as a *zygote* continues to exist through its birth and adulthood. There is no decisive break in this physical organism’s continuous development from

conception until death from which one can reasonably infer that the being undergoes a substantial change and literally ceases to exist and a new being comes into existence (like the substantial change that the sperm and ovum undergo when they cease to exist and a new being comes into existence).

## OBJECTIONS TO THE ARGUMENT THAT AN IVHB BEGINS AT CONCEPTION

It has been argued that an IVHB does not begin at conception. Some believe that the human being comes into existence very early in pregnancy, but not at conception (objection one). Others argue that a human being likely begins at conception, but it does not become intrinsically valuable until sometime later (objection two).

### Objection One:

#### Argument from Twinning, Recombination, and Cellular Totipotency

Twinning (the division of a single conceptus into two) and perhaps recombination (the reuniting of two conceptuses into one conceptus) may occur roughly within the first two weeks of pregnancy. Some argue that an individual human being is not present until twinning and recombination are no longer possible. The early embryo, moreover, consists of totipotent cells (cells with the ability to develop into a new organism or part), any one of which could be detached from the cluster and become an individual human being in its own right. Some thinkers contend that until the cells are differentiated (become more specialized) and lose their totipotency,<sup>8</sup> the embryo, though genetically human, is not an *individual* (human) *being*. Norman Ford suggests that “the early embryo is really a cluster of distinct individual cells, each one of which is a centrally organized living individual or ontological entity in simple contact with the others enclosed in the protective zona pellucida. It would be difficult to justify attributing the natural unity property of a single ontological individual to the cluster of cells as a whole.”<sup>9</sup> According to Ford, the embryo is not a single *being*, but rather, a cluster of *beings* held together by the zona pellucida, “a natural surface ‘coat’ that covers the embryo.”<sup>10</sup>

Objection one may be put this way:

1. The early embryo is not a unified being; rather, it is merely a cluster of totipotent cells that may divide into separate entities and could later recombine.
2. Any *entity* that may divide into separate *entities* and that may later recombine is not an individual *being*.
3. Therefore, the early embryo is not an individual human being.

There are good reasons to reject both premises in this argument. The second premise is clearly false. The flatworm, a being that has the potential to become two flatworms if it is cut in two, is an example of just such an individual being. Patrick Lee explains:

The reason the division does not simply result in death seems to be that the parts of the flatworm have the capacity to de-differentiate. This fact surely does not imply that prior to the division the flatworm is merely an aggregate of cells or tissues. It simply means that the parts of the flatworm have the potential to become a whole flatworm when isolated from the present whole of which they are parts. Likewise, at the early stages of development of the human embryo the cells seem to be as yet relatively unspecialized and therefore can become whole organisms if they are divided and have an appropriate environment after the division. But that fact does not in the least indicate that prior to such an extrinsic division the embryo is an aggregate rather than a single, multicellular organism.<sup>11</sup>

The first premise, meanwhile, fares no better. First, it does not follow from the totipotency of the early embryo’s cells that it is merely a cluster of cells with no organizing principle (or substantial unity) that unifies these cells as parts of an individual biological entity. “As the flatworm example shows,” writes Lee, “a totipotency of a part does not show that *prior to the division* the part is not functioning as a part.”<sup>12</sup>

Second, two lines of evidence show that the early embryo is in fact a unified being. The first is that totipotent cells do not detach from the embryo willy nilly; they detach for a reason, either by a force

external to the embryo (e.g., a scientist who intentionally splits an embryo or detaches one of its totipotent cells) or perhaps something intrinsic to the entity itself. If the former, then the divided embryo is like the split flatworm, a being whose totipotent cells were detached by an outside force. This does not mean, however, that the embryo(s) and the flatworm(s) are not each a unified being both before and after an artificial detachment. Concerning the possibility that there may be something intrinsic to the entity itself that results in the detachment of one of its totipotent cells, physician and theologian Edwin Hui points out that not every conceptus has the intrinsically directed potential for monozygotic twinning. (Twinning, of course, may occur with *any* early embryo if it is manipulated artificially, as noted above.) In other words, twinning is not “always present in the normal conditions of embryogenesis.”<sup>13</sup> It is, after all, quite rare, “occurring in only three or four out of a thousand births.” Nevertheless, writes Hui, even though “scientists are still uncertain as to why it actually takes place,” they “do know that some unknown agents seem to be needed to break down the intercellular bonds that normally hold the cells together as an individual organism.”<sup>14</sup> There is strong evidence that monozygotic twinning has a genetic cause (hence, it runs in certain families). It seems, therefore, that some zygotes have a basic duality prior to their splitting — an intrinsically directed potential that is not present in most other zygotes; thus, according to Hui, “the two beings that emerge as twins are in actuality two from conception, although in a ‘latent’ form.”<sup>15</sup>

Suppose, however, that the early embryo were to possess an intrinsically directed potential for twinning that may be triggered by some external stimulus. This would only mean that the human being, early in its existence, possesses a present capacity (i.e., twinning) that becomes latent after a certain level of development, just as some latent capabilities become present later in its existence (e.g., the ability to do algebra).

The second line of evidence showing that the early embryo is a unified human being is that the early embryo, though consisting of totipotent cells, behaves like a single organism with an intrinsic goal-directedness for which its cellular parts interact and communicate with one another *unless* one of the cells is separated from the whole. There are at least four reasons to believe this is the case:

(1) If the early embryo were not a unified organism, Benedict Ashley and Albert Moraczewski point out, the totipotent cells of the embryonic cluster “should each develop into a mature organism”; but because “they do so only if they are *separated* from the others,” it follows “that at least some interaction is taking place between them within the zona pellucida which restrains them from individually developing as *whole* organisms and normally directs them collectively to remain *parts* of a single organism continuous with the zygote.”<sup>16</sup>

(2) The zona pellucida (which Ford, Shannon, and Wolter admit holds the embryonic cell-cluster together) as well as other embryonic tissues, Anthony Fisher writes, are “formed by the embryo, usually with its genetic constitution, and for its sole benefit and use, and are indeed its organs; they are clearly not the mother’s organs, nor a tumor, nor some alien third organism living symbiotically with mother and embryo.”<sup>17</sup> Lee aptly points out that “such activities — formation of organs for the benefit of the whole — constitute the defining trait of organisms.”<sup>18</sup>

(3) Although the embryo consists entirely of totipotent cells after its initial cell divisions, “genetic restriction of the cells [i.e., cell differentiation] begins after day five, at the blastocyst stage.”<sup>19</sup> What is significant in terms of the present discussion, however, is that “the evidence also shows that the time [when this cell differentiation] begins is determined from within by a ‘clock mechanism’ intrinsic to the developing embryo.”<sup>20</sup> This shows that the early embryo is a substantial unity whose parts, triggered by an intrinsically directed “clock mechanism,” work in concert with one another for the growth, development, and continued existence of the whole.<sup>21</sup>

(4) Other evidence for the early embryo’s substantial unity includes the fact that its cells function “in distinct ways even from the two-cell stage,” such as when compaction occurs on day three.<sup>22</sup> It also includes the fact that “even before compaction, the positional differences between the cells is important, the top from the bottom, the right from the left, even though this differentiation is reversible.”<sup>23</sup> The significance of these activities should not be missed: they show that the cells of the early embryo, though

totipotent, are functioning in ways consistent with their being constituent parts of a unified organism. In other words, the cells function in concert with what the early embryo's intrinsically directed nature has instructed them to do. The unfolding is orderly and goal-directed with the end being the continuing development and subsistence of the embryo itself as a *whole*.<sup>24</sup>

### **Objection Two: Not All Human Beings Are Equally Valuable<sup>25</sup>**

Some philosophers and bioethicists argue that not all human beings are equally intrinsically valuable (IV) because some of them do not have the present capacity to exhibit certain properties or functions that would make them IV. I will call the defender of this point of view the anti-equality advocate (AEA). Although these thinkers disagree among themselves as to which properties or functions make a person IV — some offer sentience (sense perception) while others suggest ability to reason, self-awareness, or some combination of these — they all argue that a human being is IV if and only if it is presently able to exhibit certain properties or functions. The AEA is not denying that one's adult self and one's fetal self are one in the same substance, but rather, that one's fetal self was not IV because it had not yet acquired the property or properties that make it IV.<sup>26</sup> In other words, the human being does not become something else when it acquires these value-making properties during its early life (this could occur sometime late in pregnancy or after its birth, depending on what property or properties count). It remains, instead, the same being while changing from not-intrinsically valuable to intrinsically valuable. In philosophical terms, intrinsic value is an accidental, but not an essential, property of the human being.<sup>27</sup> Such an accounting of intrinsic value, however, is inadequate for at least two reasons:

First, *it cannot account for some clear cases of IVHB*. When one is asleep, unconscious, or temporarily comatose, for example, one does not have the present ability to reason or exhibit self-awareness, and yet it is unreasonable to say that one is not IV in such states. The AEA, in response, may want to argue that the analogy between sleeping/ unconscious/comatose human beings and the preborn breaks down because the former *at one time* in their existence functioned as IVHBs and will probably do so in the future, while the latter, the preborn, did not. This criteria, however, will not work. Consider the following example:

Suppose your Uncle Jed is in a terrible car accident that results in him being in a coma from which he may or may not wake. Imagine that he remains in this state for roughly two years and then awakens. He seems to be the same Uncle Jed that you knew before he went into the coma, even though he's lost some weight, hair, and memories. Was he an IVHB during the coma? Could the physicians have killed Uncle Jed's body during that time because he did not exhibit certain functions or have certain present capacities? If one holds that IV depends on present capacities, it is difficult to see why it would be wrong to kill Uncle Jed while he was in the coma; yet it would be wrong precisely because Uncle Jed is identical to himself through all the changes he undergoes, and that self, by nature, has certain basic capacities.

The AEA cannot reply by arguing that Uncle Jed's life was intrinsically valuable during the coma because *in the past* he functioned as an IVHB and probably will do so in the future. If they did we can change the story a bit and say when Uncle Jed awakens from the coma, he loses virtually all his memories and knowledge including his ability to speak a language, engage in rational thought, and have self-awareness. He then would be in precisely the same position as the standard fetus. He would still be literally the same human being he was before the coma, but he would be more like he was before he had a "past." He would have the basic capacities to speak a language, engage in rational thought, and have self-awareness, but he would have to develop and learn them all over again in order for these basic capacities to result, as they did before, in present capacities and actual abilities.

Because the AEA does not want to exclude Uncle Jed and others like him, the AEA must offer an account that includes these people but excludes the human beings they do not think are intrinsically valuable (e.g., the preborn). They cannot claim that it is the substance's present capacity that is intrinsically valuable, for that would exclude Uncle Jed and his kind. Nor does having a *past* do the trick. Suppose, however, the AEA says in reply, "OK, what makes Uncle Jed and his kind intrinsically valuable is that

there is a psychological connection between this comatose clan and their post-comatose selves.”<sup>28</sup> That can’t be right, however, for imagine that while Uncle Jed is in the coma, his physician *tells you* that your uncle will come out of the coma, but when he comes out, he will not have any of the memories, beliefs, or knowledge that he once possessed, though he *may be* able to regain them over the years following his recovery through the normal process of learning. In essence, Uncle Jed would be, while in the coma, in the same position as the standard fetus, but, unlike in the previous Uncle Jed scenario, you would *know that fact* prior to his coming out of the coma. According to the AEA it would be permissible to kill Uncle Jed while he is in the coma, for, given the physician’s diagnosis and prognosis, Uncle Jed is not, and will *never be*, psychologically connected to an IVHB from the past. Given the fact that the AEA *concedes* that Uncle Jed is substantially the same human being who remains identical to himself while undergoing the accidental changes through pre-coma, coma, and post-coma, it is Uncle Jed’s basic capacities as a human being, and not his currently exercisable capacities, that best account for Uncle Jed as an IVHB during this entire ordeal. The typical human being, moreover, possesses these basic capacities from the moment it comes into being as a zygote; thus, if the preborn is not an IVHB, then neither is Uncle Jed.

Second, *the AEA account of intrinsic value cannot account for equality among IVHBs*. It undermines the moral equality of those human beings the AEA considers intrinsically valuable. This is because capacities are stages along a continuum, with some basic capacities being exercisable only as a result of other capacities first being actualized (e.g., the capacity to learn a language requires a certain level of brain development). The present exercisability of those capacities, moreover, differs in degrees (e.g., people have a wide range of language skills). Some adult human beings, for example, are more or less rational and more or less self-aware in comparison to others; and some human beings, because they are damaged or immature, are in the process of developing and have not yet achieved certain second-order capacities (e.g., the requisite brain structure to develop the capacity to learn algebra) that make certain first-order capacities possible (e.g., the present capacity to do algebraic problems if one knows algebra).<sup>29</sup> Given the AEA argument, then, some intrinsically valuable human beings are more or less intrinsically valuable than others. Intrinsic value, however, is not a matter of degree; one either has it or does not. Intrinsic value, therefore, cannot be conditioned on the level of human capability, for if one had more capability, one would have more value. If intrinsic value is a matter of degree, then it would follow that the notion of human equality is not only illusory when applied to the preborn (which the AEA already believes) but to all human beings as well. The AEA does not want to deny human equality among IVHBs, but they can reject this undesirable belief only if they embrace the notion that human beings are intrinsically valuable because human beings are rational moral agents by nature from the moment they come into existence.<sup>30</sup>

## NOTES

1. The facts in this section are taken from the following works that deal with the unborn’s development: Ronan O’Rahilly and Fabiola Muller, *Developmental Stages in Human Embryos* (Washington, DC: Carnegie Institute of Washington, 1987); Ronan O’Rahilly and Fabiola Muller, *Human Embryology and Teratology*, 2nd ed. (New York: Wiley-Liss, 1996); Stephen M. Krason, *Abortion: Politics, Morality, and the Constitution* (Lanham, MD: University Press of America, 1984), 337–49; Bart T. Hefferman, “The Early Biography of Everyman,” in *Abortion and Social Justice*, ed. Thomas W. Hilgers and Dennis J. Horan (New York: Sheed and Ward, 1972), 3–25; and *Motion and Brief Amicus Curiae of Certain Physicians, Professors and Fellows of the American College of Obstetrics and Gynecology in Support of Appellees*, submitted to the Supreme Court of the United States, October Term, 1971, *Roe v. Wade*, 70–18, and *Doe v. Bolton*, 70–40, prepared by Dennis J. Horan et al. (the List of Amici contains the names of over 200 physicians), quoted in Stephen D. Schwarz, *The Moral Question of Abortion* (Chicago: Loyola University Press, 1990), 2–6.
2. Robert E. Joyce, “Personhood and the Conception Event,” *The New Scholasticism* 52 (1978): 101.
3. Although the normal number of chromosomes is 46, some people are born with less (people with Turner’s syndrome have 45), and some people are born with more (people with Down syndrome have 47). One’s humanity, however, does not rest necessarily on the number of chromosomes one may have but on the fact that one is a *human organism*. The human organism may have a human genetic structure that may subsist in an abnormal number of chromosomes (genes are contained in the chromosomes within the nuclei of a person’s cells), but such a being is no less human than one with an abnormal number of more obvious parts (for example, a human being born with six fingers, one arm, or one leg).
4. Some thinkers have argued that the zygote is not an individual human being at conception because it does not rely on the informational content of its genes to direct its development during the initial stages of cell division; rather, the mother’s messenger ribonucleic acid (mRNA), inherited from the ovum responsible for the zygote’s existence, directs its development until the four- to eight-cell stage. After that time, the zygote’s own genes are activated, and it begins to develop in accordance with the information encoded in those genes. See C. A. Bedate and R. C. Cefalo, “The Zygote: To Be or Not to Be,” *Journal of*

- Medicine and Philosophy* 14 (1989): 641–45. This argument rests on the faulty assumption that a human being is identical to its genes or that it is not an individual being unless it relies exclusively on its own chromosomes entirely throughout its existence. That can't be, however, for an organism can still be a unified whole and not use some of its parts, including its chromosomes. A more realistic way to understand the zygote or early embryo is to view it as a unified being with its own genetic structure whose nature requires that it use the maternal mRNA to direct its development during its initial stages. The zygote or early embryo is a *living organism* with certain powers and properties, including the capacity to be acted on by maternal molecules in order to facilitate its intrinsically directed purpose for continued development and subsistence of itself as a whole. For further critiques of this argument, see Patrick Lee, *Abortion and Unborn Human Life* (Washington, DC: The Catholic University of America Press, 1996), 98–102; Edwin C. Hui, *At the Beginning of Life: Dilemmas in Theological Ethics* (Downers Grove, IL: InterVarsity Press, 2002), 63–65; and Dianne Nutwell Irving, "Philosophical and Scientific Analysis of the Nature of the Early Embryo" (Ph.D. diss., Georgetown University, 1991), 61–71.
5. James J. Diamond, "Abortion, Animation and Biological Hominization," *Theological Studies* 36 (1975): 305–42. Although rare, twinning after 14 days may occur, sometimes resulting in conjoined twins. See O'Rahilly and Muller, *Human Embryology and Teratology*, 50.
  6. Krason, 341, citing Geraldine Lux Flanagan, *The First Nine Months of Life* (New York: Simon and Schuster, 1962), 47, 51.
  7. *Motion and Brief Amicus Curiae*, quoted in Schwarz, 3–4.
  8. Thomas A. Shannon and Allan B. Wolter write, "Maximally, one could argue that full individuality is not achieved until the restriction process is completed and cells have lost their totipotency." (Thomas Shannon and Allan Wolter, "Reflections on the Moral Status of the Pre-Embryo," *Theological Studies* 51 [1990]: 620, quoted in Lee, 94.)
  9. Norman Ford, *When Did I Begin?* (Cambridge: Cambridge University Press, 1988), 139.
  10. Hui, 238.
  11. Lee, 93.
  12. *Ibid.*, 95.
  13. Hui, 69.
  14. *Ibid.*, 70.
  15. *Ibid.*, citing Teresa Iglesias, "What Kind of Being Is the Human Embryo?" in *Embryos and Ethics: The Warnock Report in Debate*, ed. Nigel M. de S. Cameron (Edinburgh: Rutherford House, 1987), 69.
  16. Benedict Ashley and Albert Moraczewski, "Is the Biological Subject of Human Rights Present from Conception?" in *The Fetal Tissue Issue: Medical and Ethical Aspects*, ed. Peter Cataldo and Albert Moraczewski (Braintree, MA: Pope John Center, 1994), 49, quoted in Lee, 98.
  17. Antony Fisher, "When Did I Begin? Revisited," *Linacre Quarterly* 58 (1991): 60, quoted in Lee, 96.
  18. *Ibid.*
  19. *Ibid.*
  20. *Ibid.* For an explanation of this "clock mechanism," see Ann McLaren, "The Embryo," in *Reproduction in Mammals*, book 2 of *Embryonic and Fetal Development*, ed. C. R. Austin and R. V. Short, 2nd ed. (Cambridge: Cambridge University Press, 1982), 682–83.
  21. Lee, 96.
  22. *Ibid.*, 97. Lee quotes an embryology textbook's description of compaction: "Starting at the eight-cell stage of development, the original round and loosely adherent blastomeres begin to flatten, developing an inside-outside polarity that maximizes cell-to-cell contact among the blastomeres at the center of the mass. As differential adhesion develops, the outer surfaces of the cells become convex and their inner surfaces becomes concave. This reorganization, called *compaction*, involves the activity of cytoskeletal elements in the blastomeres." (William J. Larsen, *Human Embryology* [New York: Churchill Livingstone, 1993], 19.)
  23. Lee, 97, citing Benedict Ashley, "Delayed Hominization: Catholic Theological Perspective," in *The Interaction of Catholic Bioethics and Secular Society: Proceedings of the Eleventh Bishops' Workshop, Dallas, Texas*, ed. Russell E. Smith (Braintree, MA: Pope John Center, 1992), 167–68.
  24. See A. A. Howsepian, "Who and What Are We?" *Review of Metaphysics* 45 (March 1992): 483–502.
  25. Two works that were helpful in formulating my critique of this objection are Robert P. George, "The Ethics of Embryonic Stem Cell Research and Human Cloning," in *Building a Culture of Life: 30 Years after Roe v. Wade*, ed. William E. Saunders and Brian C. Robertson (Washington, DC: Family Research Council, 2002), 23–31; and Patrick Lee, "The Pro-life Argument from Substantial Identity: A Defense," *Bioethics* (forthcoming, 2004).
  26. See Dean Stretton, "The Fallacy of Essential Moral Personhood," May 2003 <<http://www.tip.net.au/~dean/femp.html>>.
  27. Some philosophers, such as Michael Tooley, seem to argue that the preborn human being is literally a different being than its healthy 20-year-old self. (See Michael Tooley, "In Defense of Abortion and Infanticide," in *The Abortion Controversy 25 Years after Roe v. Wade: A Reader*, ed. Louis P. Pojman and Francis J. Beckwith [Belmont, CA: Wadsworth, 1998].) I cannot address Tooley's case in this article. I do believe, however, the argument in the first half of this article is adequate to show that the human organism at conception is identical to its postnatal self. For sophisticated defenses of this position, see J. P. Moreland and Scott B. Rae, *Body and Soul: Human Nature and the Crisis in Ethics* (Downers Grove, IL: InterVarsity Press, 2000); and Lee, *Abortion*.
  28. See Lee.
  29. For a fuller explanation of the distinction between first-order and second-order capacities, see Moreland and Rae, 204.
  30. I would like to thank the following individuals for comments on earlier versions of, or portions of, this article: Dianne Nutwell Irving, Patrick Lee, Joseph Francis, Michael Buratovich, Scott Klusendorf, and Jonathan Wells. Much of the case I offer in this essay has been significantly influenced and shaped by the published works of Lee (especially *Abortion*), Moreland and Rae (especially *Body and Soul*), and Irving.