

## Construction vs. Development: Polarizing Models of Human Gestation

**ABSTRACT.** This essay argues that the polarization of our public debate over embryo-destructive research may be due, to a large extent, not to different valuations of individual human life but to different conceptions of the process of gestation, with one group treating the process as a making or construction and the other treating it as a development. These two incompatible models of reproduction are shown to explain the various positions commonly encountered in this debate over the treatment of embryos, and to a significant degree those encountered in the debate over abortion as well. Finally, the historical, theoretical, and intuitive strengths of each model are examined.<sup>1</sup>

If we distance ourselves from the content of the debate for and against the destruction of human embryos for scientific research purposes, we may be struck by its rhetorical form. Each side thinks not only that it has the superior argument, but that its conclusion is wholly obvious, while the other side's position is obviously mistaken. Those who defend splitting embryos to obtain stem cells (let us call them the "defenders") say that it is ridiculous to claim that a tiny zygote or blastocyst without a brain is the same sort of being as we, while those who oppose this research (let us call them the "opponents") claim it to be clear as day that each of us is the same being we were when newly conceived, though now grown up.

The resultant political and social polarization is not only unfortunate but hard to comprehend. Why should understanding be so difficult here? After all, extreme incomprehension is not normal. As a matter of debating tactics we may call another's claims "absurd," but we can usually see that a bit of reasoning has in fact been done, though not well. We can see the point of view of the other, that it could make sense to someone who had not tried hard enough to think the matter through. How then can each of the two sides in the embryo debate (sincerely, let us presume) think it

itself makes perfect sense while the other speaks virtual nonsense? This is the perplexity that originally inspired this essay.

It cannot be simply that each side starts from a different value premise. We are quite accustomed to understanding such differences. Those who eat meat can easily see that it makes sense to be a vegetarian if one considers all animal life sacred. Moreover, for the most part, there appear to be no great value differences between the two sides to the embryo debate. Few on either side would deny that the life of every individual human being should be respected by society and by science. The problem is that one side considers this principle obviously irrelevant while the other considers it obviously decisive. Why such vastly different conclusions given a shared value premise?

Nor can it be that one side simply finds the dignity of early life to be outweighed by the prospective benefits of using embryonic stem cells, while the other sees the scale to be tipping the other way. If the disagreement were only over how best to balance these or any other mutually acknowledged goods, the debate would be far less polarized. Each side would see how the other position would make some sense, even though the precise outcome of the balancing would still be in dispute. This, in fact, is the normal situation in our public debates. Why is the embryo-research debate so different?

The solution to this puzzle proposed here is that each side may begin by assuming not a value but a process, in one case a process of construction and in the other a process of development. Because these starting points are believed by their partisans to be both factual and obvious, each side fails even to imagine that the other might not begin at the same point. Thus their supreme self-confidence. Put concretely: each side appears to take absolutely for granted a model of human gestation that renders inevitable its own conclusion and impossible that of the other.

This clarification of tacit background assumptions would be worthwhile even if there were in the end no way for reason to judge between them, as could be the case, for example, if one or both rested on some religious revelation. Simply understanding one another, overcoming the sense that the other is inexplicably perverse, furthers the great good of mutual respect.

Having found a way to resolve one puzzle, we turn to another: how two such contradictory models manage to survive together in the modern world. Various inadequate explanations will be considered before turning to a simple intuitive answer. We will see that when we look forward to the future, the construction model makes more intuitive sense, while when we look backward to the past, the development model makes more intuitive

sense. Thus each model has found a psychic niche in which to survive.

Before beginning, however, certain statements of modesty are in order.

This essay argues only that *if* each side of the embryo debate adhered to one of these two models, much or all of the content of their positions would be well explained. The likely empirical existence of these two mental models of gestation is indeed suggested by this predictive power, as well as by a number of quotations, and in this article the models will often be assumed to be present in the minds of debate participants. But, in the absence of difficult and detailed survey results, the essay does not claim to prove that all or most of those engaging in the debates are consciously or unconsciously using these precise models; some other models, similar but not identical to those elaborated in this essay, could be operative, for example.

Moreover, let it be emphasized that the essay is concerned only with finding a way to understand deep disagreement about human identity (across time and change) among persons who share the widespread premise that each human being possesses a real and intrinsic dignity. (Many but not all such persons also hold that intentionally destroying an innocent human being is virtually always wrong.) The essay is not as relevant for those who do not find a dignity simply in *being* human. Its arguments might not matter much to a philosopher who considered only experience rather than being to have worth. Such a person need not find killing human beings *per se* problematic, or even care to know the kind of being that is being sacrificed. For example, a single-minded utilitarian—someone whose only moral goals were to maximize pleasurable experiences and minimize painful ones—would not see any normative difference between such experiences in humans and similar experiences in other animals, nor would the utilitarian see something intrinsically wrong with killing any of us, as long as it could be done without pain to the one killed and to others impacted by the killing.

It should be clear, therefore, that this essay does not pretend fully to analyze the complex political debates concerning whether embryo-destructive research should be permitted and subsidized. Still less does it aim to resolve all disagreement about abortion. Arguments from the abortion debates will sometimes be used to clarify the two models of gestation, but neither model of gestation can by itself dictate a position on abortion.<sup>2</sup>

## I. THE CONSTRUCTION MODEL

In December of 2005 an op-ed piece by sociology professor Dalton Conley appeared in *The New York Times*, suggesting that “most Americans . . . see a fetus as an individual under construction.” Conley, of course, could not have meant “construction” in its most immediate, literal sense. He certainly did not imagine scaffolding and ladders in the womb. Probably he meant only that most Americans consider the fetus to be an individual “in the making.” But construction is more descriptive than the generic notion of making, containing the idea not only that materials are added—or sometimes subtracted—as happens in most sorts of making, but also that the result has the integrity of a structure. And we construct not only buildings but systems, mechanisms, sentences, concepts, and much more. So let us stick with Conley’s word “construction” as the primary name for the first of the two models, while bearing in mind that other “making” words could be used to name this way of thinking.

Now just think of something being constructed (or fabricated, gathered together, mixed, created, formed, sculpted—or in any other way made), such as a manuscript being composed on sheets of paper. Or, to begin with an example a bit more analogous to gestation, take a house being built or a car on an assembly line. When is the house or the car first there? At what point in the process of its assembly would we first say, “There’s a car?” Some of us could be drawn to appearance, saying that there is a car as soon as the body is fairly complete (analogy: the fetus at three months or so, when it looks rather like a miniature baby). Others could perhaps look for some activating power, saying that there is a car only after a motor is put in place (think of the old belief that the fetus “quicken” with the insertion of an animating soul in mid-pregnancy). Others might wait until it were ready to roll or were even on the street (in analogy to viability or birth, although in reality a newborn human is not viable on its own). And there could be many other differing opinions here—as there would be if we were to elaborate upon the question of when a house comes to be (roof vs. walls vs. furnace. . .).

However, despite our differences concerning exactly when a car first exists in an assembly line, there are two points on which many or all of us would agree.

First of all, we would tend to agree that there is no one correct answer. All responses depend both upon the concept of a car that happens to be held by each person and upon how insistent each person happens to be that the object on the assembly line approximate his or her concept before

getting labeled “car.” Even if by chance there were great agreement (say two-thirds voted for appearance as the crucial element), this consensus would seem to indicate only a unity of subjective imagination, not one of objective judgment (and therefore arguably not one that should preempt other views). Note that like features (plurality and subjectivity) characterize the conventional wisdom that holds sway with regard to the point the embryo or fetus merits the label “human being,” making abortion seem a matter best left largely to personal choice. The construction model makes perfect sense of this ruling consensus.

Something upon which *all* are likely to agree: the car takes a while to appear on the assembly line. It is not immediately there at the beginning. Nobody is going to say that a car is present when the first screw or rivet is put in or when two pieces of metal are first welded together. (You can see how little I know about car manufacturing.) Two pieces of metal fastened together do not match up to anyone’s idea of a car. Someone who affirmed the contrary—that a car is suddenly present at the point where it first begins to be constructed—would not be taken seriously.

If Professor Conley is right that most Americans believe the fetus to be an individual under construction, most of us will attribute the same nonsensicality to someone we hear opposing the intentional destruction of human embryos on the ground that this destruction is a violation of the basic human right to life. Listen to journalist Michael Kinsley, writing in the *Washington Post* in favor of embryonic stem cell research, express his utter bewilderment at this opposition: “I cannot share, or even fathom, [the anti-research] conviction that a microscopic dot—as oblivious as a rock, more primitive than a worm—has the same rights as anyone reading this article. . . . Moral sincerity is not impressive if it depends on willful ignorance and indifference to logic” (2006).<sup>3</sup>

There is a deep truth at the base of Kinsley’s incomprehension. Nothing can be a particular thing until it has the essential form or nature of that particular sort of thing. And certainly the essentials of something under construction are not yet present at the beginning of the construction process. In the first stages of construction, one has not yet built a house or a car or a human individual. One never has what one is making when one has just started making it. The basic form of a thing under construction “just plain isn’t there” at the beginning of the construction process. It is not there because that form is being gradually imposed from the outside by the persons or forces doing the construction (the accumulating, the building, the assembling, the chemical mixing, the sculpting, the sewing—

or whatever other kind of making), and at the beginning they have not yet been able to shape the raw material into what it will eventually be. Only as it approaches completeness—as it acquires what some people think are the essentials of a “house,” a “car,” or a “human”—will it begin to be given those labels: a point rather vague and variable, as we have seen.

The key to this concept of construction is the gradual imposition of form. For cars and houses, one begins with little or nothing and adds piece after piece.<sup>4</sup> But making may also begin with unformed matter, as in sculpting, which is then shaped through pressure or subtraction. A constructionist could argue that just as a raw piece of wood should be given little “credit” for its potential beauty until that potential has been realized by a sculptor, so, too, an embryo does not deserve much “credit” for its potential humanity when it still resembles a rock or a worm (as Hinsley pointed out). Constructionists may thus admit that a human “potential” is there from the beginning, but assert that the embryo or fetus is not actually human until it has been shaped into recognizable humanity.<sup>5</sup>

The construction model was in fact a major, if not the dominant, understanding of early gestation during antiquity and the Middle Ages.<sup>6</sup> Thus for example, although he never favored abortion, Thomas Aquinas was partly a constructionist who did not consider early abortion to be killing in the same sense as murder. Basing his theory on Aristotle, he surmised that the male semen was used as an instrument by the paternal soul (“soul” for the Greek philosopher being a biological hypothesis, not a religious supposition) within the womb, where it was the active agent that fabricated an inert embryo out of passive maternal blood (the sperm-entering-ovum idea of conception being unimagined until much later). Only after its father’s soul had constructed an adequately human form could the fetus have its own, fully-human soul infused into it (Aquinas, Ia, Q.118, art. 1 ad 3–4, art. 2 ad 2). From that point forward, the fetal soul (like the soul of every living creature, plant or animal, according to Aquinas and Aristotle) directed further growth and preservation as a whole and healthy human organism. In other words, Aquinas taught that the infusion of an animating or rational soul was the last act in the constructionist phase of human pregnancy, the last act of making, the last joining together by a force outside the fetus. Thenceforth the fetus would be on its own, eventually manifesting its rational soul in speech and action.

Though Aquinas does not appear to have relied on revelation for his early-pregnancy constructionism, Biblical descriptions of prenatal life are likewise predominantly constructionist. However, they depict God rather

than the father's soul as the creator (constructor) of the fetus. Thus Job exclaims, "Did you not pour me out like milk and curdle me like cheese? You clothed me with skin and flesh, and knit me together with bones and sinews" (Job 10:10–11; New Revised Standard Version).<sup>7</sup> Here the paternal semen (which transmits the active agent-soul according to the teaching of Aquinas) seems to be the passive material that God as active agent first uses for the construction of the intrauterine human body.<sup>8</sup>

The presence of a construction model of gestation is especially helpful in explaining the views of those who support embryo-destructive research but oppose abortion after the first weeks or months of pregnancy. For example, those constructionists who think a heartbeat to be the essential sign of life may approve of blastocyst-destructive research but still think abortion wrong after the first few weeks of pregnancy, after the heart starts beating, while those who look for the presence of human features, such as hands or feet, may well be tolerant of abortion for nearly three months but oppose it thereafter. Both groups may believe strongly in individual human dignity and even inviolability, but simply not yet recognize the presence of a living human being before the essentials of human life are present (whatever each considers those essentials to be). They may also believe their notions of what count as life's essentials to be fundamentally subjective (i.e. only in their minds rather than in the stuff of nature itself) and so be somewhat reluctant to impose their personal views on others.

Somewhere around three months, however, the model of construction, or of any form of making, becomes rapidly more difficult to apply to the process of human gestation. At about the end of the first trimester of pregnancy, the fetus is easily envisioned by lay persons as well as scientists to be a complete, though tiny, human being both externally in its features (e.g. hands, feet, and face) and internally in its organs.<sup>9</sup> Though these will still be quite rudimentary, it is growth and maturation that are needed now, rather than further construction. In other words, because we know of no kind of making that resembles the growth and maturation of a substantially unchanging form, the construction model loses much of its power at this point. Unlike the assembling of a car (which is from beginning to end a process of addition) or the cutting away of wood for a sculpture (a process of subtraction), by three months or so human gestation would seem in fact—not just in our minds—to employ some process other than making (much as Aristotle and Aquinas taught) as the fetus moves on toward viability and birth. Possibly reflecting a consensus that that a tiny human being has now been formed, most Western nations that

have chosen to legalize elective abortion have imposed a limit of around three months (Levine 2004, 135–37) and American approval of abortion sharply declines after this first trimester.<sup>10</sup> (There are nations and persons that defend virtually elective abortion later in pregnancy,<sup>11</sup> but they may be doing so for reasons other than doubt about the existence of an actual human life in mid- and late pregnancy.)

The construction model helps explain yet another set of opinions, ones otherwise quite puzzling, about abortion and especially about the use of embryos for research. In suggesting that the embryo is “under construction,” Professor Conley did not intend to deprive it of all value. Here is a fuller statement of his view: “[M]ost Americans . . . do not think that a fetus is the same as a person, but neither do they think of it as part and parcel of a woman’s body like her appendix, her kidney, or a tumor. They see a fetus as an individual under construction” (2005).

In other words, even in constructionist thought, the incomplete embryo or fetus can have a certain value, namely, as a work in progress. Abortion may not be murder because a human individual has not yet been fully fabricated, but it is not good to destroy anything well on the way to being something that we really care about (as most of us say we do about every human individual). If the entity on the assembly line were a Corvette-To-Be and if we really loved Corvettes, we would feel bad about destroying it even part-way through the construction process. Or we might value a work in progress not for what it is becoming but for its authorship. Suppose (before the days of computers) a colleague had just begun composing an article and I took a page of his manuscript to use the back side for a shopping list. It might be true that no one would have called it an “article” yet, but I still did something wrong (in addition to theft) because I showed disrespect to its author. Similarly, abortion might be rejected not because it is murder but rather because God or one’s spouse were thought to be the author or co-author of the new life being made in the womb. Work-in-progress thinking may explain much of the feelings of those who say that there is something wrong with early abortion but that it is not as bad as killing a child already born.<sup>12</sup>

The valuing-a-work-in-progress facet of the constructionist model can also help explain one of the most perplexing positions to be found in the life debates. Some politicians wish to protect intrauterine life from abortion starting at the moment of conception, but at the same time support laboratory research lethal to human embryos that have remained unused after *in vitro* fertilization treatments. Similarly, the Irish Supreme



Court construed the clear constitutional “right to life of the unborn” not to carry over from protection against intrauterine abortion to like protection outside the womb (*Roche v. Roche & ors* [2009] IESC 82 (Ir.))<sup>13</sup> These differing stances toward newly-conceived life seem contradictory until examined under a constructionist lens.

The peculiar intermediate sort of value of a work-in-progress, e.g., of a Corvette-To-Be, comes from the fact that it is being assembled or composed or sculpted into something that we care about. In its early stages, it does not have virtually any form or value of its own (does not yet amount to much of anything) but gets its definition and meaning from the form still in the mind of its maker. Thus, if my colleague decides early on not to complete that article and tosses his work into the trash, of what value are the sheets of paper upon which he has written? They become just scrap paper; we can freely turn them over and use the back of the sheets for grocery lists, or fold them into paper airplanes. If the factory making the Corvette-To-Be shuts down, those two pieces of metal left at the beginning of the assembly line likewise become scrap. You can use them for whatever you want, for the simple reason that they are not a Corvette-To-Be any more. (“Scrap” is probably too strong a word. An old piece of construction from an admired colleague or car could well retain a kind of symbolic or souvenir value.) An embryo conceived *in vitro* outside the womb and never chosen to be implanted is even worse off. It gains little or no work-in-progress value to begin with, because it was never a “construction project” in anyone’s womb, and work-in-progress value is the only value very early life can ever have for those who agree with the construction model of gestation.

## II. THE DEVELOPMENT MODEL

We have seen how (from the perspective of the construction model) the destruction of embryos, especially those outside the womb, can appear quite reasonable, while the recognition of an embryonic right to life seems absurd. Thus we have completed half of the first task set before us at the beginning of this essay: we have shown how the defenders of embryonic stem cell research can find their opponents to lack all sense. To complete an explanation of the polarization of the stem-cell research debate, however, we must also show how the opponents of the research can find their stance fully rational and that of its defenders quite irrational. To that task we now turn.

Let us consider an entity that we think *develops* (rather than one we think constructed). A plant may be a useful starting point, so that we may clearly grasp the idea of development before applying it directly to the subject of controversy, i.e., to the sort of life that passes through embryonic and fetal stages.

Take a blue spruce. At what stage of its development would we say that a young plant becomes a blue spruce, that a blue spruce actually exists? At the very first moment it germinates and begins to develop within the seed? (In analogy to human conception or fertilization.) When it sprouts and begins to carry water and nutrients inward from its environment? (In strained analogy to a fetus with a heart just beginning to beat.) When it starts to look like a small tree? (In analogy to a fetus at around three months.) When it ceases to need constant care or is ready to be replanted? (Possible analogy to viability or birth.) Or perhaps when it finally achieves sufficient maturity to live up to the name “conifer” and bear cones? (Analogy to human puberty.)

The most appropriate response here is that these are all bad questions, ones that cover up rather than reveal our real perceptions and thoughts. The growing plant never becomes a blue spruce because it always is a blue spruce, from the first moment of its active development, i.e., from germination.<sup>14</sup> The plant develops, to be sure, from a sprout into a tree, but those are just stages of the same kind of plant—indeed, of the same individual living organism. It never was nor could be any type of being other than a blue spruce. If we ask at the nursery what those little sprouts are, the answer might well be “Those are blue spruces, but they’ve got a ways to go before they’re ready to be replanted.”

This is the development model. Note that the blue spruce participates in changing itself.<sup>15</sup> Unlike something being constructed, it does not need to wait to receive from outside itself the form that defines its nature, the form that will make it a certain kind of thing. That form, nature, or “design” (a word used here without any implication of a “designer,” natural or supernatural) is within it from the beginning, guiding its progress toward maturity.<sup>16</sup> Identified by that nature throughout its development, quite independently of its appearance or functioning, it is always the same kind of thing. And because it does not need to approximate completion before becoming what it always has been, labeling it that type of thing is not uncertain and subjective in the way that labeling something under construction a “house” or a “car” is inherently inexact and personal.<sup>17</sup>

In brief: a living organism defines itself independently of our definitions.<sup>18</sup>

The meaning of development may be further clarified by comparing and contrasting it with the sort of making called sculpting. Sculpting, as we saw above, begins with a potential; the unsculpted block of wood may be said to contain the “potential” for a statue. Likewise, the undeveloped embryo contains the “potential” for an adult. However, the potential found in the wood is wholly passive. Unlike a developing organism, the block of wood has nothing within itself to reveal. Ready to be chiseled from the outside rather than to develop itself, its future design lies within the subjective vision of the one doing the sculpting; the objective presence of that design is still wholly missing from physical reality. The humanity of the embryo, however, is always objectively present and active: the embryo is stamped from conception with the design of a human being, and that design is not just some sort of passive blueprint. It is a directing power gradually revealing its nature. Though (like the block) the embryo can linguistically be said to have a hidden potential, its active inner design already gives the embryo a species identity and an individual identity, while the passive potential of the wood does not in any way identify it as a sculpture, much less as a particular individual sculpture. Put another way, it is quite possible scientifically fully to describe the piece of wood without ever mentioning its sculptural potential, but an embryo cannot be fully described (certainly not as “rocklike” or “wormlike”) without disclosing its active inner potency, perhaps someday including (as we learn more) its particular individual character (race, deep sexual tendencies, and more). To call its future merely “potential” is thus misleading at best,<sup>19</sup> in that the word can refer ambivalently either to a passive potential or to an active potential.<sup>20</sup>

Human artifice can, however, introduce construction even into life. A quick glance at how this can happen (in a way unrelated to embryos) will be useful to clarify further the meaning of development.

Consider the type of construction called grafting. Let us suppose that what originally spouts from the ground and grows into a small tree is not a blue spruce but some sort of ordinary green spruce. Suppose further that the top of the green spruce is then cut off and the top of a blue spruce grafted upon it. (This might be done because the roots of the green spruce are hardier but the needles of the blue spruce are considered more beautiful.) After this grafted organism matures, it will be no doubt sold as a blue spruce, but the nursery owner will have to admit, if asked, that it started out as a green spruce (or, if you will, that it started out as

two trees, portions of which were then combined into one). Similarly, if human beings were made up of merely animal bodies that had had human souls “grafted” onto them by God in mid-pregnancy, we simply could not say they had existed as human individuals from conception. Grafting, like other construction, involves discontinuity, while development brings about change within a continuous identity.

This idea of development—as the continual presence but gradual manifestation of the nature of the same living thing—lies deep within us, no doubt the result of tens of thousands of years of observation by humans of the natural world around them. Look at the word “develop” itself. “De-vel-op” could be considered the opposite of “en-vel-op,” uncover and cover, show forth and veil. In some other languages this contrast is even clearer. In German, to develop is *ent-wickeln*, to unwrap, in contrast to *wickeln* or *ein-wickeln*, to roll or wrap up. In Spanish, *des-arrollar* (to develop) is a negation of *arrollar* (to roll up). In development, that which was in some mysterious way previously present but hidden becomes uncovered, unveiled, unwrapped, unfolded, unfurled, unrolled, or otherwise made manifest. This is the fundamental idea of development in our Western linguistic consciousness.

This meaning of development was relied upon when the German Constitutional Court repeatedly affirmed the constitutional right to life of the unborn child, even in quite early embryonic stages.<sup>21</sup> A 1975 decision spoke of the legal irrelevance of distinctions among the various stages “of self-developing life” (*sich entwickelnden Lebens*) (39 BVerfGE 1, 37 (First Senate 1975)). Reaffirming most of that earlier judgment, the court in 1993 wrote that discussion of the unborn concerns

. . . an individual life, one that in the process of growing and unfolding itself does not develop into a human being but rather develops as a human being. . . . It concerns . . . the necessary stages of the development of an individual human existence. Where human life exists, to it belongs human dignity . . . the dignity of human being . . . its own right to life. . . . (88 BVerfGE 203, 251–252 (1993) (author’s translation))<sup>22</sup>

Here is how the German Court had elaborated its non-constructionist position in 1975:

The process of development . . . does not end even with birth; the phenomena of consciousness which are specific to the human personality, for example, appear for the first time a rather long time after birth. Therefore, the protection . . . of the Basic Law cannot be limited either to

the “completed” human being after birth or to the child about to be born which is independently capable of living. . . . [N]o distinction can be made here between various stages of the life developing itself before birth, or between unborn and born life. (Jonas and Gorby 1976, 638)

Though the concept of development is fully at home only in the description of living organisms, an analogy to photographic “development” can perhaps make its normative import clearer. (Note that Spanish would use “*revelar*” [literally “reveal,” rather than “develop”] for the photographic process in this story; we are dealing here with a concept for the revelation of something previously hidden, not just with the conventional usage or etymology of the particular word “develop.”)

Suppose that someone is on a trip with her spouse in Chiapas, Mexico, and she snaps a picture with their old-fashioned Polaroid camera. (As may be recalled, within minutes after each Polaroid snapshot, the finished print would develop in an envelope. After opening the envelope, the print could then be directly examined and passed around.) Now suppose further that the picture she has taken is of something reasonably believed to be unique and valuable (as we say each individual human being is unique and valuable). Let us say it was a photo of a jaguar darting out of the jungle for only a second, something not likely to happen again on their trip.

But her husband in his eagerness grabs the envelope out of their camera and rips it open too quickly, thus permanently stopping the photo’s development at a very early stage. Since her jaguar picture is now forever gone (old Polaroids not retaining any negative or other copy), she is naturally very upset with him.

Would this be a good defense for him to use? “Look, honey, I didn’t really do much harm anyway. Your picture was still at the brown smudge stage when I wrecked it. You surely don’t care much about brown smudges, do you?”

Not only would this argument be unacceptable to her, she would not even understand it; her spouse would appear to be talking gibberish. She thought she had a photo of a jaguar, not a brown smudge. The chemicals present just needed time to rearrange themselves to become a picture manifest to a viewer.

The Polaroid story is, of course, in many ways not analogous to embryo research (or to abortion). It serves here only to demonstrate that the first stages of an entity’s ongoing development may have virtually the same value as the last stage of the entity’s development.

Given a similar concept of development in the minds of those who oppose embryo destruction, the words of journalist Michael Kinsley, quoted earlier, should seem to them likewise to amount nearly to gibberish. To compare a developing human embryo to a “rock” or a “worm,” because that is what it happens on the surface to resemble at the moment, should appear to developmentalists quite irrational, just as their position would necessarily appear nonsensical from his constructionist viewpoint. The humanity of a developing embryo—and not just its humanity in general (or essential humanity) but also its particular humanity (sex, race, likely height, even special talents, etc.)—seems to them present from conception rather than something to be added on from the outside in the course of gestation. For constructionists, the embryo is only a first step toward making a human being; for their opponents, the embryo is a human being taking his or her first developmental step.<sup>23</sup> To try to justify embryo destruction or early abortion by pointing out that there are still more steps to go (organs to develop, viability to achieve, and the like) appears to those opponents as logically irrelevant as to point out that the jaguar picture had still not developed beyond the brown smudge stage.<sup>24</sup>

We have now completed the two parts of the first task assigned at the start of this essay; we have shown how it can be that each side in the embryo research debate can consider itself wholly rational and the other side wholly irrational. Our next task, it will be recalled, is to see how both models can survive in the modern world, and indeed (as we shall see) how both can survive in the minds of those on each side of the embryo research debate.

### III. WHY DO BOTH MODELS SURVIVE IN THE MODERN WORLD?

The construction model was the leading understanding of early gestation in the pre-modern era, as we have seen.<sup>25</sup> The great historical advantage held by constructionist thought is, however, counterbalanced by sizable disadvantages. Very few modern scholars, even or especially among those otherwise more traditional, still hold to the biologies taught by Aristotle or the Bible.<sup>26</sup> A model of embryo construction is difficult to formulate in an academic world that no longer admits the possible agency of soul-infused semen or divine intervention. Who or what would do the constructing? Moreover, the existence of the ovum and the truth about the mutual male–female contributions to conception are now known. Once the union of gametes and the developmental role of genes became clear, there was no longer any theoretical need even to search for an outside constructor

(paternal, divine, or whatever) of unborn human bodies. Embryos could now be thought to develop on their own, given the proper environment, from conception all the way to maturity. In other words, developmentalism now appears to have seized almost the whole process of gestation, in that the last chance or construction event, the last event where a making could possibly occur, would seem to be the union of sperm and ovum, or the insertion and activation of a cell nucleus in the case of cloning.<sup>27</sup>

An even greater problem for constructionism is this: in the end, life appears difficult or impossible to construct from parts. Something merely put together, or otherwise made, does not hold itself in being, does not monitor and govern itself in the way living organisms do. An “*in-dividual*,” a being unified and indivisible, cannot be composed of unrelated parts that some outside force has simply pushed together into a certain shape and then abandoned. Here the inadequacy of the Polaroid analogy must be pointed out. We can speak reasonably of photographic development revealing an image or form previously present though hidden. But this “developed” image has no power to maintain itself or to maintain any print in which it appears. If someone scratches it, it will not repair itself, restoring the damaged image, any more than a constructed house or car can put itself back together after some accident. A photographic print may go through a process in some way like biological development, but the final result is much more like a construction than like a living organism—for besides developing themselves, living organisms, to a large degree, maintain themselves in being, heal their own scratches, and restore their own health. A living being actively resists its own decomposition, until the moment of its death, while a car or a photo does not.

If a contemporary constructionist cannot envision a qualitative change from constructed thing to living creature to take place during gestation, then she will not envision the unborn fetus ever to be truly alive. Even if it finally fulfills her subjective criteria for counting as a living human being, the fact that it appears to be merely constructed means that it cannot be fully appreciated as a living human being, for its form will not seem to sustain itself. Put another way, no mere construction can, at any stage, be as fully alive as a developing being is from the first moment of its active development, for only the latter contains and gradually manifests its own form. Perhaps this is the explanation for the curious absence of passionate anti-abortion-in-mid-or-late-pregnancy activists, the absence of any great campaigns to forbid late abortion by persons indifferent to, or supportive of, early abortion. All or almost all anti-abortion activists

oppose abortion throughout pregnancy, while those who say they oppose abortion only after some point in mid-pregnancy are rarely or never activists (though they may hold and express anti-late-abortion views). If the latter are constructionists, and construction alone cannot generate life, then their lack of passionate opposition to late-term abortion makes sense. Yes, the fetus now meets their definition of a human being, but it still does not seem to them really alive because they still define it rather than it defining itself.

Ancient and medieval thinkers started with construction, but they knew that, sometime during pregnancy, the unborn child became master of its own being. Thus they supposed the infusion of an active, form-maintaining, rational soul (a scientific hypothesis, not an appeal to faith, it will be recalled) as the last step from construction to development, from fabrication to human existence. The leap thus posited was nearly as radical as the human body's later transition from life to death, which involved in turn the loss of the same form-maintaining soul. In order to keep using a similar construction model in early pregnancy, but still end up with a living being later in pregnancy, or after birth, today's constructionists might have to find a like point of biological bifurcation, a like qualitative change from inert object to active subject at some early stage of life. (To be most convincing, this profound shift would probably have to occur by around the end of the first three months of pregnancy, when, even to a layperson, there is a miniature but growing and recognizably human body that clearly maintains and develops its own form, so that further "construction" becomes difficult to envision.) But no such radical disjunction during the process of gestation is widely known, or known at all.<sup>28</sup> How, then, can many or most people in our secular society still "see a fetus as an individual under construction," in the words of Dalton Conley cited at the beginning of this essay?

Perhaps modern constructionists know about development but think of it simply as self-construction. The active design found in the human genotype could be said to construct the human phenotype. But this neat dualism, even if biologically tenable, could not reduce the embryo just to a constructed object, for even in this dualist conception each new living organism would contain the sculptor as well as the sculpted. Each embryo would have both genotype and phenotype entwined within it, giving the embryo as a whole a particular human identity from the beginning. In other words, the embryo must already be human in order to construct itself as human. A non-living entity under construction lacks the identity



of its final form because that form must still be imposed from the outside. But an embryo supposedly “constructing itself” possesses the active fundamentals of that form within itself from its beginning, already giving it a particular human identity.

Moreover, such dualism is not in fact tenable. Genes do not construct a body out of passive matter. Causation is sometimes reversed; the organic environment may tell certain genes in a cell whether to be active or passive. For example, differing nearby cells, or differing external conditions, may cause initially identical genes to act quite differently, a process often referred to as *epigenesis*. There is no way to separate the constructor and the constructed within an organism.<sup>29</sup>

Knowledgeable defenders of embryo research might pick up on the process of epigenetics in a broader sense in order to emphasize that development is thus not similar to the unveiling or revealing of a tiny *homunculus*, as some thought in early modernity (Jones 2004, 165–68), nor even to the revealing of an exact pre-set image found in the genetic code, but involves construction in part from the outside. Because the developing embryo (and indeed all life) responds to (learns from) opportunities, and the lack thereof, within its environment as well as within itself, defenders of embryo research might say that some “constructive credit” in every successful development belongs to that environment, not to the developing organism.

However, although it is certainly true that at every stage of life, including adulthood, organisms exist in dependency and interaction with their surroundings, developing life is the key formative element in each interchange, and this self-informing capability is present from the beginning (Moratalla and Martínez-Priego 2002, 193–224). The presence or absence of water may greatly influence the development of both plants and puppies, but they use water in different ways.

In our technological age, some might be attracted to constructionism because they feel that we are near to creating life, or near to creating machines that can behave much like living creatures. The line between construction and development might seem to them soon to be blurred if not erased.

Still, the whole point of creating biological life would surely be to initiate the sort of being that cannot be understood as merely put and held together by its constructors. Artificially created life would still have to have a nature of its own, with its self-maintenance and further development thus no longer artificial, or else it would not count as life.

Advances in artificial intelligence would seem at first sight a more promising explanation of the survival of the constructionist model, for here the hope is not just that life can be artificially initiated, but that its very nature can be through and through a construction of human ingenuity.<sup>30</sup> Could we not eventually develop non-mechanistic machines, machines that had the capability to learn on their own, machines that could not only maintain and repair themselves but even develop new abilities—like the ability to think as we do—“epigenetically,” based on opportunities, or the lack of them, in themselves or in their environments? Perhaps yes, though the task would be far more formidable than anything so far created by us in our machines or even in our thoughts; the sheer intelligence that has evolved in the organization and development of even the simplest plants and animals may well exceed that of the greatest human minds. However, even if it were possible for us to pierce the veil that hides the nature of life, including intelligent life, we would not have changed that nature. We would just have constructed machines that truly live, that are masters of their own being, that gradually manifest themselves, albeit perhaps starting from a base in silicon rather than in carbon. We will have created entities that are not mere constructions but instead are developing beings. The progressive changes in, and the eventual *acts* of, those machines will, as a result, have to be understood using the development model rather than the construction model of change. If you will, we shall have become like God, but, precisely for this reason, the highest sort of creatures we can or will construct (like God’s own creations) in the end will have rational natures like ours—natures that guide their development from their very beginnings to the full manifestation of reason. We might well feel a kinship and awe for the directing power found even in the early stages of the thinking-capable machines we would have engendered, and so refrain from destroying them, just as many developmentalists feel kinship and awe for the embryos we now engender (because those embryos from their first beginnings have just such an active rational nature).

Yet another explanation for the survival of constructionism may lie in the fact that, although the human body may develop from conception, the human mind is to a very great degree a familial and cultural construction. Nowhere is this clearer than in the acquiring of a language. Every human being is internally designed to speak, from the moment of conception, but the particular language spoken is given to each by that person’s linguistic group. This externally-added facet of consciousness is not merely an unformed resource, like water, that is used and shaped solely

by the developing human. Each language has an elaborate structure of its own long before it is picked up by an individual. Moreover, we cannot speak at all without learning a particular language; a boy being raised by wolves would never talk in more than a rudimentary way. The capability for speech, therefore, is both an active and a passive potentiality. Speech requires genuine co-formation of our manifest humanity from both inside and outside ourselves. In this sense, it seems correct to claim that human beings (individuals, persons) are to a significant degree constructed entities.

What develops from the inside, however, meshes well with what must be constructed from the outside. (A cup can be said to be ready for water even though it cannot fill itself. Once the roof beams are in place, a building already has incorporated a certain roof design, though the roof itself remains absent.) Speech remains a natural human development, even though it cannot emerge without the artifact of a particular language. And so the ontological “longing” for speech remains intact even when it is frustrated. Human beings who temporarily or permanently lack the ability to speak—e.g., those living among wolves or those in a coma—do not and cannot lose their inner directedness toward speaking. The frustration of this inner purposiveness, i.e., of their constant and continuing human nature, is what makes the conditions of the wolf-child and the comatose person tragic (as bestial and vegetative, respectively). We do not shake our heads sadly and remark, “Look at that poor wolf behaving like an animal,” or “Pity that spruce just vegetating there in the forest,” because there is no frustrated human nature present. There can be no tragedy where the wolf and tree are able fully to express their own non-human natures.

Similarly, the reality of a certain amount of post-birth “sculpting” (by society) of the human mind cannot easily account for the survival of a constructionist model of the creation of human beings, for we are committed (both politically and in our deepest intuitions) to the recognition of full human dignity long before any construction of qualities like language is complete many years after birth. That is, we commonly recognize human dignity in very young children despite the fact that they will be able to act in a fully human way only far in the future, after much socialization. Even though the human potential found in a child may not be able to develop fully without some outside formation, John Rawls, for example, regards “the potentiality as sufficient,” for children to have human rights:

[T]he minimal requirements defining moral personality refer to a *capacity* and not to the realization of it. A being that has this *capacity*, whether or

not it is yet *developed*, is to receive the full protection of the principles of justice. (1971, 509; emphasis added)<sup>31</sup>

Newborn children for a considerable time after birth cannot think and love; we treasure and protect them because they have been conceived by us and because of what they are on the way to becoming. We delight in a baby's smile as a harbinger of human love because we know he or she is a being designed for the love we will show and teach them. We care about our offspring for their full potential, not just for what they can already do, nor just for the truncated abilities they could manifest if left without outside guidance. That is, we are committed to giving them credit for their latent capabilities, even though we know those capabilities will be formed in part by parents and society.

Putting the same point negatively: to insist upon the actual construction and functioning of personal human consciousness (not just the inner design for human consciousness) before recognition of a human right to life would be to authorize the killing of human beings already born to us, something quite unacceptable to the moral intuition of most.<sup>32</sup> Few of us would turn surplus newborns over to science for lethal experimentation, even though those traits that make our species special have not yet been realized in them. Moreover, to treat newborns as not yet human would require deep changes in our lives and in our understanding of the world. We could no longer celebrate "our" birthdays—for we would not yet have come into existence when our mothers gave birth to the things that were later used to construct us.

#### IV. THE INTUITIVE IMPASSE

Yet even if constructionism could win some or all of the theoretical debates described above, this victory could not fully account for the force that constructionist views appear to have in America today, and this for two reasons: first, it seems doubtful that most people are familiar with such esoteric debates, and yet, if Professor Conley is right, a construction model of gestation makes sense to "most Americans." Second, constructionism is so strong that many, like Michael Kinsley, think the developmental view makes no sense at all. But anyone familiar with the above debates would surely concede a degree of cognitive merit to the developmental arguments.

Therefore, something else must be stirring, or perhaps quieting, the minds of those who seem wholly oblivious to the developmental perspective in early pregnancy. Despite the absence of any likely intrauterine constructor or maker, constructionism appears strongly to endure among many who

claim to understand embryonic life.<sup>33</sup> What can account for the enduring appeal of the idea that the embryo, like the car on the assembly line, is indubitably to be identified only by those of its parts that are already manifest?

One simple answer amounts to an accusation: defenders of embryo research (and abortion) who are well educated must be acting in bad faith. Although it remained an intelligent hypothesis for many centuries, the construction model cannot be sincerely held, even unconsciously, by any thinking person today. Defenders of embryo research must be claiming that human identity is lacking in the embryo only because they do not wish the research to stop and, at the same time, do not wish to be seen to be attacking widely shared principles that affirm the dignity, equality, or inviolability of all human beings.

This simple answer is, however, too simple. It is a one-sided conversation-stopper that ignores the significant attraction that the construction model continues to have for those on *both* sides of these debates.

Opponents of abortion themselves commonly resort to constructionist arguments, often pointing out that fetuses that have been aborted had already manifested some of the essentials of human life; witness the common bumper sticker that proclaims “Abortion stops a beating heart.” Is this just a political attempt by developmentalists to garner support among those constructionists who consider a heartbeat necessary and sufficient to indicate life, even though developmentalists themselves really see no difference between killing an embryo without a heartbeat and a fetus with a heartbeat? Jon Shields has noted further that pro-lifers in general devote much more time to stopping abortion than to stopping lethal embryo research (2011, 507).<sup>34</sup> Again, this could be only a matter of politics, a choice by developmentalists to concentrate on an area where many constructionists will likely lend some support. But Shields has also presented evidence that precisely the most militant opponents of pre-natal killing find abortion to be much more deplorable after the first trimester of pregnancy (2011, 509–10).<sup>35</sup> In further support of Shields’ contention that even pro-lifers think the stage of pregnancy to be a sensible consideration, we may note that research for this essay found many examples of defenders of embryo research who consider their opponents’ position absurd, while far fewer examples were discovered of anti-research people who lament the utter absurdity of the position of those who favor this research. Could it be that, in their heart of hearts, even developmentalists have constructionist intuitions with regard to the earliest stages of gestation?

The author of this very essay finds himself pulled in both directions. Kinsley's comparisons of the embryo to a rock or worm seem to him sometimes sensible and sometimes nonsensical. How can this be? How can the constructionist view on occasion seem intuitively plausible, while at other times what appears to be the more scientifically accurate developmental view makes more intuitive sense?

Perhaps the constructionist view is intuitively more appealing whenever the future is shut out of our minds. Whenever the embryo or fetus is visualized simply in terms of its current appearance, it is easy to fall into constructionism. No photograph, for example, can depict the dynamic inner self-direction of an embryo. So if a snapshot is taken, the embryo looks like nothing more than a ball of cells. It seems inert, for its future is hidden. Because an entity that had merely embryonic characteristics as its natural end state would indeed not qualify as a human being, it is easy to imagine that the entity in the snapshot is not human. Scientific knowledge of its inner activity may not be enough to overcome this impression, for it is hard to recognize—or even to imagine—a nature or design still hidden from view.<sup>36</sup>

There may be a still greater difficulty. Whatever intuitive problems we may have in general with envisioning radical metamorphosis, with seeing substantial future change in form to be a development rather than a construction, with recognizing mere sprouts to be developing spruces or caterpillars to be developing butterflies, it seems nigh to impossible to think of the sprout or the caterpillar as a *particular* or *individual* spruce tree or butterfly. But this is how human beings have to be imagined by us. We normally think of other creatures generically, as just a certain type of tree or insect, but we think of humans as specific individuals, albeit ones whose individuality may happen to be unknown to us. Because the embryo in the photo cannot (except arbitrarily) be ascribed any particular characteristics, it cannot easily be thought of as a developing individual. The scientific fact that “This embryo can grow up to be an adult human being” is too abstract. We have all seen plain trees and butterflies, but none of us has ever seen a plain (i.e., non-individuated) adult human.

If we could someday analyze an embryo's genetic and epigenetic structure and conclude, “This embryo will grow up to be a petite Asian woman with considerable artistic talent,” the development model might well become intuitively more compelling.<sup>37</sup> (In a similar way, although “brown smudge” might initially seem a reasonable description of an early stage of development of a Polaroid photo, those words are obviously not

an adequate description of a photo once we know it to be on its way to becoming a particular sort of picture, that of the jaguar we glimpsed flashing momentarily out of the jungle.) Or perhaps (despite the uncertainties of epigenesis) a computer could someday read off a visual image from her genetic and other characteristics and show us her likeness—even her very face<sup>38</sup>—as a baby, little girl, teenager, or adult. A consensus opposed to violence against embryonic human beings might then more easily emerge.

As long as we are not able to foretell embryonic destinies, however, we will have the paradox that the construction model for radical gestational change makes intuitive sense when looking forward to the future while the development model makes more sense when looking back to the past—precisely because as we look back we already know the future that the developing entity once held within it. We may doubt that a new sprout, or even a barren vine, is really a tomato plant, but once it bears tomatoes, we know that it was always a tomato plant. We may doubt that embryos are persons, but as we look back upon ourselves or upon our neighbors, we recognize that we and they were all once embryos. An embryo may at first seem like a little round rock as we look at a photograph, but if that embryo snapshot was taken twenty years ago, just after our friend Mary was conceived *in vitro*, we may well exclaim to her, “Look, Mary. That’s you!”

Thinkers on each side of the debates about early human life have agreed that the identity—and any accompanying dignity—of life over time becomes much more compelling when we look back into the past. Philosopher Jeffrey Reiman, a defender of abortion, acknowledges regretfully that

we tend to read a kind of personal identity backwards into fetuses, and personal identity carries connotations of moral identity beyond mere physical identity. . . . Just because it is so natural to us to think that way, I believe that this ‘retroactive empersonment’ is the single greatest source of confusion in the abortion debate. (1999, 92)

Abortion opponent Oliver O’Donovan puts the same point well when he writes, “[T]hose . . . yet unborn become *known* to us as persons when they are children. . . .” (1998, 384; emphasis in original). We come to know embryos as persons when we come to know the child-persons who first came into existence as embryos.

Political advocates on either side of the embryonic stem-cell research debate seem to know where their strengths lie. Defenders of this research have focused on the minimal already-manifest characteristics of embryos,

pointing out, for example, that the “embryos destroyed in stem-cell research do not have brains, or even neurons” (Harris 2007, 29). At the same time, opponents of embryonic stem cell research have pressed the continuity of identity that is more visible in hindsight: The United States Conference of Catholic Bishops (USCCB) a few years ago made widely available an ad with a picture of a newborn baby and the caption “270 days ago, Joshua was just an embryo.” The text went on to emphasize that “embryonic stem cells . . . come with a heavy price tag: they are only obtained by destroying a living human embryo. An embryo like Joshua, 270 days ago.”<sup>39</sup> In 2010, Irish opponents put up billboards with photos of many stages of life, from embryonic to elderly, and the words “YOU. ME. EVERYBODY. WE’RE ALL JUST GROWN-UP EMBRYOS.”<sup>40</sup>

Such arguments by the opponents of embryo-destructive research are fundamentally cognitive, not emotional. They are attempts to wrap our minds more fully around the developmental model, attempts to overcome our difficulty in imagining that one and the same organism may, in the future, undergo radical changes in outward form. They work (if they do work) by first looking backward from fully developed persons, where the continuity of personal identity is concrete and easy to see, and then very quickly looking forward from still undeveloped embryos, in the hope that their future continuity of identity will be easier to imagine.

These anti-research arguments are cognitive in yet another sense, a sense in which the counter-arguments used by the defenders of embryo research are non-cognitive. Our forward-looking intuition that an embryo is like a rock depends on our ignoring (not necessarily out of insincerity but rather because of a limit to our imaginations) what we actually know about the embryo. Jon Shields has put this point quite well:

[To say that] embryos are merely “clumps of cells” . . . tends to obscure scientific truth itself. This characterization suggests that an embryo is not *biologically* different than what we might find under our fingernails if we were to gouge a bit of skin from under our arms. It is to imply erroneously that they lack coherence, integrity, and self-direction as organisms. (2007, 19)<sup>41</sup>

Our backward-looking intuition, by contrast, is not only compatible with but actually depends upon modern scientific knowledge. It is only because of this knowledge that we can point to an old photo of an embryo and say, “That was you, Mary, when you were newly conceived.” Someone who believed that Mary first came into existence in mid-pregnancy when



God grafted a rational soul onto a previously subhuman fetus would not, *could not*, point to the embryo in the photo and say “That was you, Mary.”

## NOTES

1. This article is an expanded revision of “Construcción vs. desarrollo: la raíz de nuestros malentendidos sobre el principio de la vida” (2008). An early version of Craig Payne’s essay, “The Difference Between Form and Shape: Why Human Appearance Is Morally Irrelevant” (2013) was of great assistance, as were cogent critiques of earlier drafts by James Hanink, Gilbert Meilaender, Jeffrey Reiman, Stephen Schwarz, and Jeremy Telman, among others. A fuller exposition of the author’s own understanding of individual identity can be found in “The Priority of Respect: How Our Common Humanity Can Ground Our Individual Dignity” (2004), translated and revised as “La prioridad del respeto: cómo nuestra humanidad común puede fundamentar nuestra dignidad individual” (2010).
2. Another reason for the seeming intractability of the abortion debates, besides disagreement about the content of moral rules, is that they sometimes center around the meaning of the word “person.” On the one hand, there is our practice of considering all (but not only) human beings to be persons, perhaps reflecting the ancient Boethian philosophical realism holding that a person is “an individual substance of a rational nature” (Boethius 2004). At the other extreme is our practice of stipulating who or what is a person simply for the sake of conferring legal standing, without regard to the nature of the object so labeled. In between lie an immense number of possible mixtures of realism and nominalism, including somewhere the influential Western religious tradition that finds three persons in a single God. Primarily in order to avoid such complexity, this essay speaks only of how “human beings,” or sometimes “individuals,” come to be. But a valiant reader is welcome to take the essay to concern two models for the genesis of persons, one that sees persons being constructed and another that sees persons developing.
3. Udo Schüklenk, who as co-editor of *Bioethics* should know the arguments on both sides, treats as reasonable the claim

that embryos 10–14 days after conception really are *nothing more than accumulations* of a few hundred cells. . . . [We should not] treat a few hundred cells as if they were people, because these cells [are] so evidently not people to begin with. Why should one treat something as if it were something else that patently it is not? (2008, ii; emphasis added).

(Note especially Schüklenk's use of the term "accumulations;" accumulating is at best a making, if not just a formless piling up.) In the same vein, Robert Pasnau writes that "it is surely absurd to think that a few *unformed* cells count as a human being" (2002, 120; emphasis added). Daniel Dombrowski and Robert Deltete declare such thinking "ridiculous" in the context of abortion (2000, 129). Law professor Geoffrey Stone is likewise simply dumbfounded by the position of those who strongly oppose embryonic stem cell research.

In vetoing the bill that would have funded stem-cell research, President Bush invoked what he termed a "conflict between science and ethics." But what, exactly, is the "ethical" side of this conflict? Clearly, it derives from the belief that an embryo smaller than a period on this page is a "human life"—indeed, a human life that is as valuable as those of living, breathing, suffering children. And what, exactly, is the basis of this belief? Is it Science? Reason? Logic? Tradition? Morals? None-of-the-above? What the President describes neutrally as "ethics" is simply his own, sectarian religious belief. (2006, 27)

I doubt very much that Professor Stone actually investigated President Bush's Methodist "sect" and discovered that its creed prohibits embryonic stem cell research. (It does not.) His allegation of a religious doctrine appears to come, fairly enough, at the end of an exasperated process of elimination.

4. Children at the "artificialism" stage of cognitive development often imagine piece-by-piece baby-making. They have been called "manufacturers" in that they tend to think of reproduction as an additive process: "You just make the baby first. You put some eyes on it. You put the head on, and hair. . . ." (Bernstein and Cowan 1981, 14). A subsequent study found this tendency to hold across four cultures, with Jesus, God, the doctor, or the father doing the manufacturing. See Goldman and Goldman 1982, p. 494. However, while the researchers in the first study asked neutrally, "How do people get babies?" Bernstein and Cowan (1981), *supra* at 13, the later researchers asked a leading question, one favoring a constructionist answer: "How are babies *made*?" (emphasis added), Goldman and Goldman, *supra*, at 493.
5. The construction model here described contains two elements: a constructive design and a thing being constructed. This two-part model appears to be widely present in historical and current scientific-political-moral debates surrounding gestation, as discussed below. But a one-part model could be operative in the minds of some observers. That is, a constructive design might be thought absent, so that the realization of the resultant entity must be ascribed to physical necessity and chance (and perhaps also to the survival only

of the fit). This, indeed, was one hypothesis entertained by Aristotle in his *Physics* (1970; book ii, chapter 8) before he settled definitively on the idea of a teleological “nature” at work in each living being. Many or all of us believe in the accidental genesis and growth of, say, a tornado or hurricane. We do not think anybody or anything to be making it; it just sometimes happens by a mixture of climatic regularities and (bad) luck. However, even if such a view were widely held and plausible today with regard to human gestation, it would have little relevance to the task at hand, which is to explain how it can seem absolutely nonsensical to claim that a human being exists from the beginning of pregnancy. Like automobiles, tornados exist only when they are essentially complete. (Furthermore, we may well disagree about the point at which that happens: what speed must the wind have reached? Must the cone have touched ground?) The humans-exist-from-conception claim must seem quite as absurd to anyone who reduces gestation to necessity and chance as it does to those who liken gestation to construction.

6. For a fine survey of the (commonly constructionist) ideas of human gestation held throughout history, see Jones 2004. Ancient non-constructionist approaches still linger in language that speaks of the male “seed” (*semen* in Latin) being placed in a “fertile” woman.
7. See also Psalm 139 (138): 13–14 (New Revised Standard Version): “For it was you who formed my inward parts; you knit me together in my mother’s womb. I praise you, for I am fearfully and wonderfully made.” The Bible elsewhere states that God knew us *before* forming us in the womb (Jeremiah 1:5), meaning perhaps that we existed in some way prior to God’s construction of our body, or meaning only that we were known in the way God knows the whole future in advance.
8. Biblical thought is constructionist on a still deeper level: God “created” (made, constructed) the heavens and earth, and the earth had previously been “formless” (Gen. 1:1–2; New Revised Standard Version). (This vision stands in sharp contrast to that of Aristotle, where there is no creator of the universe. On its own, form either presents itself eternally, in the cosmos, or replicates itself eternally, in living organisms.) Although constructionism thus stretches back thousands of years, and is present in the Bible, research for this article has been unable to discover any period in which a certain view of gestation or point of soul infusion was taught as a dogma in Christianity. The biblical references are poetic in tone, rather than authoritative, and Aquinas seems to have been untroubled by the fact that those biblical passages did not exactly harmonize with his own partly constructionist exposition of gestation. The existence of an individual life from the moment of fertilization of maternal

egg by paternal sperm could, of course, hardly have been conceived, much less required by faith, as long as the existence of the human ovum itself was still uncertain, *i.e.*, until the early nineteenth century, around the time that Karl Ernst von Baer spoke of its reproductive role in his path-breaking *Epistola de Ovo Mammalium et Hominis Genesi* (Leipzig, 1827). Kevin O'Rourke points out that even today there is no official Catholic dogma concerning a point of ensoulment (2006, 249–50). The apparent absence of any binding religious revelation or settled dogma on any side of the embryonic research debate bodes well for the eventual achievement of consensus through public reason. But *cf.* the Vatican statement *Dignitas personae* that seems to be edging toward a declaration of personhood or ensoulment from conception (Congregation for the Doctrine of the Faith 2008; hereafter *Dignitas personae*).

9. This is a commonplace image. For example, webmd.com states: “By the end of the third month of pregnancy, your baby is fully formed. Your baby has arms, hands, fingers, feet, and toes and can open and close its fists and mouth. Fingernails and toenails are beginning to develop and the external ears are formed. The beginnings of teeth are forming” (last visited Aug. 6, 2012). Babycentre.com.uk explains: “At 13 weeks your baby is about 6.7cm long from crown to rump. She weighs about 23g and is fully formed. She has begun swallowing and kicking. All her organs and muscles have formed and are beginning to function. Tiny fingerprints are now at the tips of her fingers. All this month, your baby’s facial muscles are getting a workout as her tiny features form one expression after another” (last visited Aug. 6, 2012).
10. A Gallup poll published on August 8, 2011, found that 52% of “pro-choice” respondents favored making abortion *illegal* in the second trimester of pregnancy, and 79% would do so in the third trimester (while 89% of pro-choice people wanted it legal in the first trimester) (Saad 2011).
11. As of 2004, the United States, Canada, Netherlands, and Sweden were apparently the only Western democracies that extended abortion on request beyond twelve weeks (Sweden only to eighteen weeks) (Levine 2004, 135–37).
12. The late Ronald Dworkin has shown how a slightly different sort of constructionist thinking can give work-in-progress (but still non-personal) value to a fetus. He suggests that the investment already made, by the parents or even by nature, in such a noble project should not be wasted unless an abortion is necessary for some greater good (1993). For a lengthy argument against Dworkin’s theory of value, see Stith 1997.
13. The authors of the court’s opinions interpret the Irish constitution to provide protection only for an embryo that remains within the womb of its “mother.”

- None focuses upon the identical nature of embryos inside and outside the womb. That is, the judges appear to think the object of constitutional protection to be a relationship rather than a being.
14. The question of how to describe the inactive (usually permanently inactive) ungerminated spruce seed is discussed *infra*, note 20. Because that inactive state is not perceived as developing, however, it is not useful here for the purpose of understanding the idea of development.
  15. “Develop” in this essay is an intransitive (“the fetus is developing”) or reflexive (“the fetus is developing itself”) verb referring to self-development, to the process in which a being develops itself from within, albeit usually with resources (energy, water, nutrients) obtained from outside itself—for it is only this sort of development that can easily accommodate the biological facts (discussed below) and, more importantly for this essay, can account well for the point of view of the strong opponents of embryonic stem cell research. As a matter of linguistic usage, the word can, of course, be used transitively (“the mother is developing the fetus”). It is often so used to cover non-living entities that may be constructed in large part from the outside, as in the case of someone “developing a theme” or an aid-giver “developing a country’s economy.” But, even in such cases, the word “develop” still connotes some inward form being carried forward (gives part of the “credit,” so to speak, to the theme rather than to the person elaborating upon it, and to the country rather than to any foreign aid it is receiving). Occasionally, however, a word like “development” may even be used to refer fairly precisely to construction. Judith Jarvis Thomson may slip into this use when she writes confusingly, “[I]f children are allowed to develop normally they will have a right to vote; that does not show that they now have the right to vote” (1995), and Robert George and Christopher Tollefsen, in an otherwise excellent book, call hers “the developmental view” of what happens during pregnancy (2008, 115–16). But the right to vote would seem to be something given by democratic societies (and not by other societies) to each adult human, i.e., something added from the outside rather than developing from the inside of each human being, so the Thomson–George–Tollefson use of the word “development” is hard to understand.
  16. Note that both constructionism and developmentalism differ from reductionism (which holds that the form of any whole is an illusion, in that only the separate parts of the apparent whole really exist) and from vitalism (which holds that a separate and non-material life force turns mere things into living organisms). Both (in contrast to reductionism) find a role for form to play, and neither (in contrast to vitalism) need envision any non-material life force

- to be playing a role (although a certain Aristotelian–Thomistic subset of constructionists could be said to treat the infused soul as a vitalist principle).
17. While the current version of this paper was being prepared, in a serendipitous confluence of independent work, Maureen Condic, Associate Professor of Neurobiology and Anatomy at the University of Utah School of Medicine, published a useful essay concerning the beginning of human life: see Condic 2008. The section entitled *Does a human being control its own development or is it manufactured?* calls attention to the presence of constructionist (or “manufacturing” in her words) thinking and contrasts that thinking with (what she argues to be more accurate) developmental understanding. That section deserves to be quoted at length:

[One] way of thinking about human development is compelling to many because it is similar to our thinking about the much more familiar process of manufacturing. A car is not a car until it rolls off the assembly line—until then it is a bunch of parts in the process of becoming a car, but not there yet. Similarly, a cake is not a cake until it comes out of the oven—until then it is a variously gooey mass of flour, sugar, eggs, and butter that is gradually becoming a cake.

However, a profound difference exists between manufacturing and embryonic development. The difference is who (or what) is doing the “producing.” The embryo is not something that is being passively built by the process of development, with some unspecified, external “builder” controlling the assembly of embryonic components. . . . The organized pattern of development doesn’t produce the embryo; it is produced *by* the embryo as a consequence of the zygote’s internal, self-organized power. Indeed, this “totipotency,” or the power of the zygote both to generate all the cells of the body and simultaneously to organize those cells into coherent, interacting bodily structures, is the defining feature of the embryo.

An additional problem with comparing [embryo development] to manufacturing is that, unlike the building of an automobile, there is no actual endpoint to the “building” of a human being. Human development is an *ongoing* process that begins with the zygote and continues seamlessly through embryogenesis, fetogenesis, birth, maturation, and aging, ending only in death. Indeed, why consider the entity present . . . at birth a human being, and not merely a “unique collection of human cells in the process of becoming a new human, but not there yet”? Once a concession has been made to the concept

of manufacture and to an arbitrary point at which development has proceeded “far enough” along the assembly line to generate a human being, the precise positioning of this point becomes purely a matter of preference, convenience, and the power to enforce one’s view.

In contrast, if the embryo comes into existence at sperm–egg fusion, a human organism is fully present from the beginning, controlling and directing all of the developmental events that occur throughout life. This view of the embryo is objective, . . . and it is consistent with the factual evidence. It is entirely independent of any specific ethical, moral, political, or religious view of human life or of human embryos. Indeed, this definition does not directly address the central ethical questions surrounding the embryo: What *value* ought society to place on human life at the earliest stages of development? . . . A neutral examination of the factual evidence merely establishes the onset of a new human life at a scientifically well-defined “moment of conception,” a conclusion that unequivocally indicates that human embryos from the zygote stage forward are indeed living individuals of the human species—human beings. (*Id.* at 11–12; emphasis in original).

18. This sentence plays with the word “define,” pointing to the fact that a developing organism delimits itself physically, unless it is cancerous, and that we must take such natural self-definition into account in defining our human world. See Kripke 1980, especially pp. 125–27, for more on the idea of “natural kinds” to which our concepts conform.
19. Etymologically, the word “potential” is not inappropriate, related as it is to a Latin word for “power.” But its passive and subjective connotations make it misleading in this debate. Perhaps the predicate “capable” would be more exact. A just-completed nuclear reactor could be said to be “capable” of generating a great amount of energy, even if it will take a year for it to develop sufficient heat to begin to do so. We could say that a teenager has the talent or inner capability to become a great actor, even if it will still take years of work for her to develop that talent. In the same way, we might say that a human embryo or newborn child is the sort of being capable of choosing, reasoning, and loving, although he, she, or it will not actually be able to do these things for some time to come. Though the word “capable” does not precisely capture the idea of development, it does give the reactor, the teenager, the embryo, and the newborn more of the “credit” they presently merit, while “potential” either denies it to them or is at best ambiguous.

20. There is a stage of plant life that appears (at least in our intuition) to stand at the frontier between passive and active potential, and that is the seed. A seed has an entire future within it and yet still does not develop itself. Thus the slogan “An acorn is not an oak” may make sense to nearly everyone, both constructionists and developmentalists, for even the latter may perceive a continuity of being only after development has begun. (A German speaker might not join quite so readily in this consensus: “Eine Eichel ist nicht eine Eiche” may be less obviously true than “An acorn is not an oak,” for the word *Eichel* is an old diminutive of the word *Eiche*. At least at the time the word “Eichel” was first formed, some sort of identity between the two seems to have been perceived.) However, developmentalists could deny any close analogy between acorn and embryo, precisely because the acorn, unlike the embryo, is inert. In order to begin to develop, an acorn seed needs one or more catalysts added from the outside, probably warmth and water, to cause it to germinate, to activate its potency—just as Frankenstein’s monster needed an electric shock to come alive. That is, the acorn still needs a quasi-constructive step before development can begin. By contrast, animal life is active and developing right after fertilization; it never goes through an inert seedlike stage.
21. See Judgment of 25 February 1975, 39 BVerfGE 1 (First Senate) (F.R.G.), translated in Jonas and Gorby 1976, pp. 605–84, and see Judgment of 28 May 1993, 88 Entscheidungen des Bundesverfassungsgerichts [BVerfGE] 203 (Second Senate), 1993 Europäische Grundrechte Zeitschrift [EuGRZ] 229.
22. Note particularly the developmental concept in the words “unfolding itself.” The German original reads in fuller form

[H]andelt es sich bei dem Ungeborenen um individuelles . . . Leben, das im Prozeß des Wachsens und Sich-Entfaltens sich nicht erst zum Menschen, sondern als Mensch entwickelt. . . . [E]s handelt sich . . . um unabdingbare Stufen der Entwicklung eines individuellen Menschseins. Wo menschliches Leben existiert, kommt ihm Menschenwürde zu. . . .

Diese Würde des Menschseins liegt auch für das ungeborene Leben im Dasein um seiner selbst willen. Es zu achten und zu schützen bedingt, daß die Rechtsordnung die rechtlichen Voraussetzungen seiner Entfaltung im Sinne eines eigenen Lebensrechts des Ungeborenen gewährleistet. . . . Dieses Lebensrecht, das . . . dem Ungeborenen schon aufgrund seiner Existenz zusteht, ist das elementare und unveräußerliche Recht, das von der Würde des Menschen ausgeht . . . . Id.



The degree of legal protection owed to the fetus is independent of the stage of pregnancy. *Id.* at 254. The court adds that this conclusion is valid independently of any particular religious beliefs, concerning which the legal order of a religion-and-worldview-neutral state can make no judgments. *Id.* at 252. The legal protection of each individual unborn life is a precondition for ordered community, *id.* at 282, though such protection need not always be via criminal law. Note that the court was not asked to consider the status of the pre-implanted embryo, though its reasoning would seem to apply equally prior to implantation, for self-development begins during or just after fertilization. (And German law does in fact protect even non-implanted embryos against lethal experimentation. Embryonenschutzgesetz (ESchG) [Law on the Protection of Embryos], Bundesgesetzblatt 1990 I: 2746. See Section 8(1) for the definition of an embryo, which includes “the fertilized human egg cell capable of development” [“die befruchtete, entwicklungsfähige menschliche Eizelle”].) Note that from this non-constructionist point of view, as Donald Kommers has pointed out, “the most non-religious Social Democrat could agree with the most religious Christian Democrat” on the state’s duty to protect the life of the unborn human throughout pregnancy (1994, 28). For a further elaboration of the court’s complex decisions, see Stith 1997.

23. Could development be thought to begin earlier? If embryos are developing human beings, could sperm cells or ova also be such? The answer is “no.” No one nowadays thinks either can develop further on its own. It makes sense to write “When I was a just-conceived fetus . . .” as does Ronald Dworkin (1993, 18), but it would be unintelligible to say “When I was a sperm cell” (or “. . . an ovum,” or “. . . a sperm and an ovum”) because, before conception, the sperm and ovum are far more like a man and a woman before they get to know each other than they are like a single organism, in that prior to conception there is no active immanent design directing those particular cells to form any one of us. They come together only through chance—*cf. supra* note 5—or today perhaps through construction, e.g., through *in vitro* matchmaking.
24. To use embryos as fodder for research may appear to developmentalists actually more dehumanizing than to abort them. Many people have abortions because they think that they have a duty as parents to take care of their nascent child if they let the child be born; they have the abortion because they do not feel that they are up to doing that duty. Despite its seeming violence, abortion can have a human and a familial aspect to it, in that it may acknowledge a future parental relationship and parental duty. In such a case, the aborted fetus dies at least with the dignity of having been for a

little while on the way to being someone's cared-for child, and its loss may even be mourned by its parents, perhaps even as a dead child (especially in later pregnancy, when even constructionists may consider a child essentially complete) but at the least (in early pregnancy) as a precious work in progress, as Professor Conley implied. The clash of the constructionist model with the developmentalist model is, however, much greater with regard to embryo research. Both models, as we have seen, may find something to regret about abortion. But they split radically with regard to the killing of extra-uterine embryos. In contrast to how they may feel about aborted fetuses, pure constructionists can care very little, logically, about embryos destroyed just after they have been conceived or cloned in a test tube. Never having been works in progress, such embryos seem to lack any relationship to a future human form, or to their parents, and so can be used and used up in experiments. Yet from the very beginning, for a developmentalist, the identity and dignity of a human being remain constant. The value of that jaguar photo changes hardly at all from the instant that it is snapped to the moment when it is fully developed. Thus, from a developmentalist viewpoint, embryonic stem cell research is not less but more dehumanizing than abortion. Embryos subject to research are first commodified and then destroyed for body parts. Few if any mourn their deaths. So it is that their human dignity can appear more radically negated by embryonic stem cell research than by abortion.

25. See text accompanying notes 6–8, *supra*.
26. See the fine summary of modern debates among Thomists found in Haldane and Lee 2003, pp. 255–78.
27. This observation is founded on fact and logic, not on authority. But it is also an ordinary teaching of modern science in contexts not involving a defense of embryo destruction. See, e.g., Moore and Persaud 1998, p. 2: “Human development is a continuous process that begins when an ovum from a female is fertilized by a sperm from a male. A zygote is the beginning of a new human being. . . .” and Larsen 1998, p. 14: “This moment of zygote formation may be taken as the beginning or zero point time of embryonic development.” Maureen Condit’s excellent paper explores in much greater detail the precise moment in zygote formation at which a new individual life has begun, focusing especially on disputes among scientists concerning the significance of syngamy (2008, 8–9).
28. “The body of a human being, from the very first stages of its existence, can never be reduced merely to a group of cells. The embryonic human body develops progressively according to a well-defined program with its proper finality . . .” (*Dignitas personae* § 4). This continuity “does not allow us to posit either a change in nature or a gradation in moral value.” *Id.*, § 5.

29. Cf. Talbott 2010, p. 3.
30. The construction of an “autogen,” of a self-generating and self-organizing system, a goal of applied cybernetics, may also help us understand better the evolutionary emergence of “purposive organic life and cognitive processes.” See the somewhat misleadingly-titled essay by Colin McGinn, “Can Anything Emerge from Nothing?” (McGinn 2012) (review of Deacon 2012).
31. Immanuel Kant also relies on humanity as an inner essence or nature, present long before it is fully manifested, to indicate who has human dignity and autonomy rights. A small child is “a being endowed with freedom” long before it can act freely:

[T]here follows from *procreation* in [the marital] community a duty to preserve and care for its offspring. . . . For the *offspring* is a *person*, and it is impossible to form a concept of the production of a being endowed with freedom through a physical operation. . . . They cannot destroy their child as if he were something they had *made* (since a being endowed with freedom cannot be a product of this kind) or as if he were their property, nor can they even just abandon him to chance, since they have brought not merely a worldly being but a citizen of the world into a condition which cannot now be indifferent to them even just according to concepts of right. (1996, 64; emphasis in original)

32. Rakowski makes a similar point in criticizing Dworkin (1993), arguing as follows:

A newborn’s cognitive abilities are little different from those of many nonhuman animals. Yet many people think an infant deserves the same protection as older people because of what it could become. . . . But what about killing a fetus? A fetus’ potential is the same as an infant’s. . . . This fact motivates most moral distress over abortion. . . . (1994, 2078)

33. Recall that, in an early section of this essay, we saw many contemporary references to the embryo as something constructed, accumulated, made, or still unformed—even though no outside creator to do the construction or the making or the accumulating or the forming is easily available in modern biology. See *supra* notes 3 and 4 and accompanying text.
34. Shields also points out that abortion providers themselves are more distressed by abortions after the first trimester, when fetuses develop human-appearing characteristics, and often refuse to do such abortions (2011, 504–05).

35. Carefully considered, Shields' data do not quite support his conclusion that these militants feel early abortion to be less immoral. Their greater hostility to late-term abortionists could be due to the militants feeling that those abortionists have no excuse for ignoring the humanity of the unborn, whereas during early pregnancy abortionists, under the influence of constructionism, may not fully realize what they are doing.
36. This is the reverse side of the difficulty constructionists have in applying their model to fetal development beyond at most three months, as noted in the text accompanying note 9, *supra*. Just as it is hard to apply the construction model to the growth and maturation of an already present form, so it is hard to apply the development model to *metamorphosis*, to *transformation*, to apparently substantial changes in outward form. This may be one reason Aristotle delayed fetal ensoulment until a point in early pregnancy before which there had been a gradual construction of human form, by the paternal soul working through the semen.
37. Kwame Anthony Appiah takes a giant step toward imagining an individualized, and thus humanized, future for the unborn when he writes that Americans debating abortion might consider that "those dead fetuses could have been . . . their children's friends" (2006, 82). The capacity to be a friend is a universal trait of human beings and yet also a personalizing one. There are many "Asian women with artistic talent," but every friend is a unique individual. To say that an embryo could be a friend is thus to envision it as a human individual even though nothing individual is yet known about him or her.
38. Emmanuel Levinas suggests that it is precisely the face of the Other that calls us to obligation (Levinas 1969). Real-time ultrasound images of fetal faces may indeed already be affecting our attitudes to prenatal life. However, perhaps no computer-generated image of a face could present the Other in the way an actual face can do.
39. United States Conference of Catholic Bishops, Secretariat for Pro-Life Activities, <http://old.usccb.org/prolife/JoshuaFINAL.pdf> (last visited Sept. 4, 2012).
40. LifeSiteNews (Nov. 15, 2010) <http://www.lifesitenews.com/news/you-mewere-all-just-grown-up-embryos-billboard-campaign-counters-embryores> (capitalization in original). Opponents of abortion, like those opposed to the destruction of embryos, have attempted similarly to use hindsight to show the dynamic quality of intrauterine potential and its ability to provide a unified identity across the span of human development. During the week of President Obama's first inauguration, as described by LifeSiteNews, there appeared a brief video that was viewed by hundreds of thousands of persons.

The ad shows an ultrasound of a baby in a womb, while the text explains that during his life the baby's father will abandon him, and his single mother will struggle to support him. But "despite the hardships he will endure," the ad continues, "this child will become the 1st African American President." The ad climaxes with a picture of President Obama and the slogan, "Life. Imagine the Potential."

LifeSiteNews, (Jan. 25, 2009), <http://www.lifesitenews.com/news/pro-life-obama-ad-viewed-over-250000-times-in-three-days>.

41. Shields' paper was the lead article in a symposium on "Politics, Sentiments, and Stem Cells."

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