

# IS THE EARLY EMBRYO A PERSON?

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## I. INTRODUCTION

Dr. Ian Wilmut of the Roslin Institute announced that in July 1998 Polly and Molly were born, two successfully cloned sheep containing a human gene. His group hopes that with this human gene they will be able to obtain milk that will offset hemophilia in humans. The ability of science is amazing. One wonders, though, how the human gene was obtained. Is this one more instance of our blurring the lines between human and animal research? Having acquired the ability to provide a couple with their own genetically related child by manufacturing the human embryo in a petri dish, it seems that we are ready to do more than provide a childless couple with a child, for we are ready to freeze it, use it for experimentation, and even discard it when no longer useful.

To do any one of these things is possible. To do them for a good purpose could be moral, if the early embryo were not a person. Then acting for some good purpose would not be wrong, since it would not be at the expense of an innocent person's harm or death.

Certain scientists, philosophers, and theologians have indeed argued along these lines. One might terminate the life of an early embryo because it has a "genetic abnormality," or because the woman does not have the capacity to carry a child to term without risk to herself, or because a woman who was raped has the "right...to a meaningful life and a healthy personality development."<sup>i</sup> They have contended that the early embryo, though genetically identifiable as human, is not a person. Thus, they hold that for certain good reasons the development process of the early embryo can be stopped—stopped before that process arrives at the point where the embryo becomes a human person. These authors have based their judgments on biological data and philosophical reasoning about the nature of the human person. Are they right?

This paper seeks to examine their arguments for the non-personhood of the early embryo and to propose counter-arguments for saying that the early embryo is a person.

## II. NOTION OF PERSON

The starting-point of their argument about the early embryo is the notion of person. Definitions range from “a person is any one who is a human being” to “only those human beings who can think and choose are persons.”<sup>ii</sup> Many of those who work out of the Catholic tradition follow Thomas Aquinas in using the definition of the fifth century Christian philosopher, Boethius. A person is an individual substance of a rational nature.<sup>iii</sup> Richard McCormick, S.J., in arguing that the early embryo is not a person, uses Karl Rahner’s paraphrase of this definition, namely, that a person is “the actual unique reality of a spiritual being, an undivided whole existing independently and not interchangeable with any other.”<sup>iv</sup> Thus, in determining what is a person, one would look for that which has these characteristics.

In using Rahner’s paraphrase, we need to be extremely careful, however. First, to be a spiritual being does not imply that one cannot be material. Whereas God, angels, and humans are all spiritual beings, humans are spiritual as well as material in nature. “Spiritual” denotes a mode of acting rather than the absence of the material. A spiritual being is a substance. It is not a part of something else, but stands on its own and has dominion over its own actions.<sup>v</sup> In so far as this substance is a nature, having its own principle of action, and in so far as it is a rational nature whereby its self-directing power attains a degree of self-dominion that surpasses that of other substances by reason of its intelligence and choice, the proper name of this substance is “person.”

It is also extremely important to point out that Rahner’s term “undivided whole” is not another way of saying “individual substance.” The term “undivided whole” could mean, as Shannon and McCormick take it to mean, not only that the substance is a whole rather than a part, but also that it is something that cannot be divided. However, this is not the meaning of “individual substance.” Aquinas uses each of these words with a very specific meaning. The term “substance” stands in contrast to the term “accident.” An accident is part of something else and gets its individuation by being in that particular thing. A “substance” is not part of something else. It is a whole, it stands on its own, and it gets its individuation or singularity from itself. Furthermore “substance” is used

to deny that we are speaking about a unity that refers to a class of things and to affirm that we are speaking about a unity that refers to the thing itself.

The word “individual” also has a distinct meaning. According to Thomas it characterizes a substance as having a unity to it that is greater than the unity of nature. Whereas human nature can be assumed by the Word of God, the *individual* substance of a rational nature cannot be assumed. Thus the word “individual” does not refer to the “indivisibility” of substance as such but to its incommunicability.

To discover when the fertilized egg or embryo is a person, one would look for the time in its development when all these conditions are met. It is a material and spiritual entity, self-directing, substantial rather than accidental, a whole rather than a part, individuated in itself rather than by being in something else, having a unity that makes it incommunicable with anything else. Should these characteristics be met simultaneously, one would say that at this point one has a human person. On the other hand, should they not be met, one could say that the biological entity is not a person.

### III. EVIDENCE THAT THE EARLY EMBRYO IS NOT A PERSON

Cahill lists three lines of evidence that are offered for saying that the fertilized ovum, the zygote, is not a person.<sup>vi</sup> First, there are so many fertilized eggs lost at the zygote and blastocyst stages and before implantation in the uterus that it would seem unreasonable to call these persons. Such wastage, at least to one’s imagination, argues that the fertilized egg or early embryo does not have the worth that is proper to a person. Second, the individual zygote is so “totipotent” that it lacks the stable and substantial basis for the individuality or undividedness of the person. The fertilization that produces a zygote and its progeny of cells can bring about many different things, such as a hydatidiform mole, a tumor,<sup>vii</sup> a placenta,<sup>viii</sup> a human being, twins or, apparently, a recombination.<sup>ix</sup> Third, whereas the nature of a human person is substantial and self-directing, it is said that the zygote and its immediate progeny before implantation, even with its genetic makeup, receives direction from outside itself.

It seems that thinkers like McCormick and Mahoney hold that it is not even probable that the zygote and whatever is classified as the “pre-embryo” is a human person. While McCormick presents very important arguments for saying that we have a *prima facie* obligation to treat it as a person, he (like Mahoney and others) is convinced that the genetic individuality of the zygote is not a strong reason for saying that the normal zygote *is* a person.<sup>x</sup> But are there other reasons, besides the simple fact of its genetic individuality, for saying that the zygote is a person? The following counter-arguments seek to show that there are and that it is quite reasonable to judge that many (though not necessarily all) fertilized eggs meet the criteria for personhood and should not be put at unnecessary risk.

#### IV. COUNTER-ARGUMENTS CONCERNING THE BIOLOGICAL DATA

##### A. EARLY EMBRYO LOSS

First, let us consider the “loss of the early embryos” argument against the personhood of the normal zygote. Rahner, Shannon and Wolter, and McCormick<sup>xi</sup> say that the loss of the human zygote and its cells is very great and that this suggests that at this stage we are not dealing with a human person. Reported losses vary from 45% to 60% of the fertilized eggs. Shannon and Wolter say that the loss is so great that it would not only be unreasonable but even sacrilegious to assert that the early embryo is a human person.

First, we need to ask a factual question. On what basis does one say the loss is great? In his latest edition of *The Developing Human*, Keith Moore says that “at least 15% of zygotes die and blastocysts abort.” But because women are unaware of pregnancy, one can say that it is higher, so Moore adds another 30%, twice the percentage of known fetal losses.<sup>xii</sup>

Moore says that it has been estimated that one-third to one-half of all zygotes never become blastocysts and implant. Unfortunately, he does not indicate how he makes this estimation. In a very important and sophisticated study, Wilcox and associates were able to detect the clinically unknown pregnancies of which Moore had spoken. The clinically unknown pregnancy losses were roughly twice that of the clinically known losses. But in their study the total miscarriages were

31% rather than Moore's 45%. This was a study in which 86% of the 190 women had previously used oral contraceptives. Contraceptives are considered to be a cause of miscarriages. For those who did not use contraceptives, the loss could conceivably be less. Wilcox and associates said that two previous studies reported higher losses than theirs, but that the method of the other studies "could lead to false positive results," thus raising the number estimated. For Wilcox and associates the estimated loss is near one-third rather than one-half.<sup>xiii</sup>

Second, one must ask about the meaning of this loss. Moore and Wilcox agree. Most of those spontaneously aborted were morphologically abnormal and presumably not viable. As Moore puts it,

The early loss of embryos, once called pregnancy wastage, appears to represent a disposal of abnormal conceptuses that could not have developed normally, *i.e.*, a natural screen of embryos. With this "screening," about 12% instead of 2 or 3% of newborn infants would likely be congenitally malformed.<sup>xiv</sup>

With this knowledge, we cannot simply say that because so many zygotes die, they could not possibly be persons. Why? Because most of the wastage is attributed to the "abnormality" of "the conceptuses that could not have developed normally." Thus, the extent of the loss does not say anything about the zygotes that survive, much less imply that all zygotes are not persons. For instance, the death of abnormal conceptuses can be due to the extent of their abnormality rather than due to any inherent instability of the zygote itself. It is theoretically possible that some of the zygotes that die because of their abnormality are so abnormal that they do not meet the minimum genetic requirements to be persons. Other zygotes do meet that minimum. Some of these die, while others go on to birth. Some of those that do go on to birth have some abnormality, like Down's Syndrome; some do not. Whatever their life-span, though, these zygotes have met the minimum genetic requirements to be constituted as persons.

The situation of extreme abnormality can be seen in those fertilizations that result in a hydatidiform mole or go on to become a tumor. If the process of fertilization is so unstable as to produce a mole, a tumor, or a zygote, then some authors conclude that the zygote, which is one of the

products of fertilization, is just as unstable and so could not possibly have the substantial unity required for a person. It is as if hydatidiform moles and tumors are just cases of zygotes going bad.<sup>xv</sup> How can one say that this conclusion is wrong? It is wrong because hydatidiform moles do not come from a normal fertilization process. Antoine Suarez says that the complete hydatidiform mole does not have the normal maternal and paternal nucleus. Instead it has two paternal nuclei, having lost the female nucleus.<sup>xvi</sup> After about two months this mole-pregnancy ends or progresses to a trophoblastic tumor. In reviewing Suarez, Bole seems to accept the conclusion that these moles did not come from normal zygotes, so what is said of the mole as being a non-person cannot therefore be said of the zygote as such. But he then asserts that normal zygotes have developed into partial hydatidiform moles and he gives a reference to prove his point. However, the reference cited does not indicate that normal zygotes produce this result.<sup>xvii</sup> Furthermore, Robboy, Duggan, and Kurman report that the partial hydatidiform moles have “69 (rather than 46) chromosomes” and that this represents an “abnormal chromosomal complement.”<sup>xviii</sup> Since the normal zygote has 46 chromosomes and the partial hydatidiform moles has 69, there is, contrary to Bole’s contention, no chromosomal evidence that a normal zygote produces this kind of mole either. That is, full and partial hydatidiform moles do not provide evidence that the zygote as such shares in their defects and thus should share in their non-personhood status. Thus, normal zygotes, those that are 46xx or 46xy, as well as those slightly less than normal, such as trisomy 13-zygotes, or trisomy-18, or trisomy-21 (Down’s Syndrome) zygotes, or those with Klinefelter’s Syndrome (47XXY), or Turner’s Syndrome (45XO) meet the genetic structure requirements for constituting a human being and sharing in personhood status.

#### B. THE TOTIPOTENT ZYGOTE AND EARLY EMBRYO

What of zygotes that do not become moles or tumors? Are they so indeterminate and so totipotent that they do not have the stable individuality necessary for personhood? Not really. Consider the zygote and its divisions. While it is true that the zygote divides into genetically

identical cells, they and the cells that continue to arise from such divisions are not simply a loose connection of cells that either become two radically distinct and different things such as twins or the less radically distinct embryo and placenta. This can be seen if we first consider the normal divisions of the cells, *i.e.*, the divisions that do not give rise to twins. Dr. Paul Flaman says that, unless separated, these cells function as an organism rather than as a colony of individual cells.<sup>xix</sup>

There is a real unity to these cells, a wholeness. This unity is indicated in how they operate. Even by the third division of cells, which is within a very short time-period, there is evidence of a unified operation. Instead of the two cells each dividing again, as if they were independent and indifferent to one another, only one of them divides. The other does not.

What seems to be happening is a coordination of the cell-divisions, which is brought about by a process called methylation. Methylation directs certain operations of the cells, in which some genes are “silenced” and other genes are “turned on” so that development can take place. This produces a cascading effect, so that the gene turned on (or off) at one stage itself controls expression of other genes at the next stage.

Another indication of the unity of the cells is noted by Moore. By the time of the morula stage, the cells are tightly compacted. This permits greater cell-to-cell interaction and is a prerequisite for the segregation of the internal cells that form the embryo-blast or inner-cell mass of the blastocyst.<sup>xx</sup> From these factors we can say that we are not dealing with “loosely associated cells” but with an organized entity. The organization is so strong that even when the cells become distinguished as extra-embryonic and embryonic, they function as a complete organism and not as two separate entities.<sup>xxi</sup> This unity is also seen in the cellular parts themselves. So, for instance, parts of the extra-embryonic material do not end up as part of the placenta which is “discarded at birth.”<sup>xxii</sup> Rather, this extra-embryonic material ends up as part of the person’s gut, urinary tract, or blood.<sup>xxiii</sup> So, both the unified operation and the power of the extra-embryonic material to become and remain part of the person’s permanent organisms are indications that we are already dealing with that which has a wholeness and unity to it and a unified operation. In other words, contrary to McCormick and to Shannon and Wolter,<sup>xxiv</sup> there is a

significant continuity rather than discontinuity between the zygote and its progeny of cells with their integrated and operational wholeness and with their further development at implantation, in which embryonic organization is more developed. At their pre-implanted stage the cells exhibit a stable unity of being and operation that a person would need for human existence.

#### C. TWINNING

On the other hand, zygotes have been known to divide into two separate entities. So Bole, McCormick, Shannon and Wolter<sup>xxv</sup> have argued that twinning is an indication that we are not dealing with primary embryonic organization, much less a stable individuality. If twinning occurs, they argue, then division taking place; the zygote is not indivisible but divisible—and so not individual. Primary embryonic organization cannot be taking place, they say, since the zygotic stage would be the time when singleness (individuality) is being established and when “the source of only one individual” is present.

The first response to this argument is to say that such twinning is rare, occurring on average only once in ninety pregnancies.<sup>xxvi</sup> To argue from such an exception to a general conclusion that the zygote and its consequent blastomere are nothing but colonies of individuals does not seem philosophically correct. In the majority of cases, one observes that the dividing cells of the zygote do not behave like individual beings loosely united. They behave as a single unity. This is evident, as said above, even after first division of the zygote. Since this is true in the majority of cases, one has to be careful how one interprets the exceptional phenomenon of twinning. Rather than saying that the exception of twinning indicates that the cells of the non-twinning zygote act as independent wholes, one should expect that what happens to each of the twinned cells in the exceptional case would be what happens to the non-twinned cell in the usual case. And indeed this is so. Each of the twin cells behave as the non-twinned one, moving from simplicity to an ever more complex, differentiated but integrated unity. While the occurrence of twinning is exceptional, the process of development for twins is the same as for the single zygote. Thus there is no warrant for saying that the



exceptional case of twinning “qualifies some of the moral claims made even during normal embryogenesis.”<sup>xxvii</sup> The development of each of these entities affirms the power that preserves individuality rather than denies the individuality of these two entities.

Furthermore, in speaking of personhood, one has to be careful how one uses the terms. For instance, Shannon uses the term “individual” to make the following argument. He says that one “condition of personhood” is that it is an individual. But an individual refers to that which cannot be divided and which, if divided, would yield only parts of a whole and not the whole itself. Consequently, he concludes, the division that occurs in twinning is a manifestation that we do not have a person, since in this case of division two wholes rather than parts are yielded.<sup>xxviii</sup>

Such an argument, however, assumes a definition of person that is different from the line of thought that goes from Aristotle through Boethius to Thomas and it assumes an inference that is not necessary. Consider the definition of person. Shannon and Wolter understand individuation for a person to come from something being added on to the organism, namely, a level of development that prevents another individual from coming to be.<sup>xxix</sup> While this understanding of person fits well with the way they understand the data they analyze, it does not fit the understanding of person that Thomas developed in line with Boethius and Aristotle. Consequently, when Shannon and Wolter seek to establish that the early embryo does not fit their definition of person as individual, they do not establish that the early embryo does not fit the definition of person as proposed by Thomas. This means that their argument might be successful in terms of their definition of person, but not in terms of the traditional understanding of person.

The traditional understanding of person is the opposite of Shannon’s and Wolter’s. It is not something added on. Rather, “person” refers to a first substance (in Aristotle’s sense of the term<sup>xxx</sup>). It is an entity that underlies everything else, and that everything else is either predicated of it or present in it.<sup>xxxi</sup> For Aquinas, the individuation of personhood does not refer to the distinguishing characteristic of an entity in the way that “rational” would be the distinguishing characteristic of man, or “singleness” the distinguishing characteristic of person. Personhood, like

substance, is prior to genera, *e.g.*, animal, and to species, *e.g.*, rational animal.<sup>xxxii</sup> Rather, personhood refers to the entity itself and underlies all distinguishing characteristics, even developmental characteristics.

The inference of Shannon and Wolter does not follow. One can grant that when a substance is divided into parts, it ceases to be that substance.

However, one cannot infer that the thing whose division produces two wholes rather than parts is not a substance. This inference would follow if there were but two possible alternatives. In that case, the negation of one affirms the other. If not B, then A; if not A, then B. But when there are more alternatives than two, the negation of one does not mean the affirmation of the others, or *vice versa*. If not B, then it could be A or it could be C.

In the case which Shannon and Wolter propose, we do not have two alternatives but a number of possibilities, each with its own nomenclature: 'wholes,' 'individuals,' 'parts,' and 'divisions.' One division leaves only parts of a whole; another division makes two wholes. An individual is a whole. An individual is not a part. This means that if there are no parts after a division, we must have had more than one possibility prior to the division: (1) that there was no individual in the first place; (2) that there was an individual but the division did not produce parts of an individual but two individuals. In other words, when "individual substance" refers to a person, it does not exclude the multiplication of persons; it excludes its division into parts. Furthermore, the person is said to be an "individual substance" insofar as that person is a concrete living human being (as opposed to an abstract universal "human being").<sup>xxxiii</sup> A universal can be applied to many things, or (to borrow Mark Johnson's words) it can "share itself around."<sup>xxxiv</sup> An individual cannot do this. It refers to but one thing. It is a unique reality. It cannot be assumed by any other. So, only in the sense that an individual or person cannot be divided into parts and still remain a person<sup>xxxv</sup> can we use Rahner's definition of person: "the actual unique reality of a spiritual being, an undivided whole existing independently and not interchangeable with any other." But Rahner's paraphrase of the traditional notion fails as a substitute for "individual substance" when it means that an individual substance cannot be divided and become two

individual substances.

Thus, when twinning occurs, individuality is not lost, even though division happens. Instead of becoming a collection of cells that separate from one another and even pass from one body to the other as interchangeable parts, the separated cells or blastomeres (in twinning) act independently of one another and as their own individual wholes. Within each separate body, the genes give direction to the full development of the human being. Operations, as said above, are turned on and off as the entity develops from cells to tissues to organs to complex systems that function not independently but as an integrated whole. Not only do the two bodies function as independent beings but their functioning is generative rather than degenerative. Instead of the separated cells being unable to hold onto that which gives them unity and coherence, as happens when a living entity is split into parts and the parts decay or degenerate into something less than the whole that they were, the cells that twin exhibit such a powerful unity that with each division and multiplication of cells the complex reality of the person's human body is built up. Contrary to Shannon's negative meaning for individual, the positive meaning of individual is "indivisible." In its positive sense, "individual" does not just refer to a concept such as Scotus's *haecceitas*.<sup>xxxvi</sup> "Individual" refers to a living, self-sustaining, independent unity. Once "twinning" or "embryo division" occurs, one witnesses the unfolding of two individual persons. This division does not become the occasion for denying the existence of a person at the pre-implanted embryo stage but for affirming the existence of two persons at that stage.

#### D. RECOMBINATION

But is recombination not possible and does that not destroy individuality?

Not necessarily. To be sure, there is a rejoining at times, as seen in the case of Siamese twins. But these twins, though fused, do not make one individual. They are two individuals. And, in these cases, doctors often can even determine that a particular part used by both individuals belongs to one of the twins but is shared by the other.<sup>xxxvii</sup> As for earlier stages of development (such as when twins are connected with a single placenta),

it would be theoretically possible to determine whose placenta it is and who is sharing it even if this is not practically possible in our present state of technology. In general, however, we know that individuality is preserved and not lost when conjoined twins occur.

Would not the recombination of two genetically different individuals into one individual demonstrate that there is no individuality before the implantation stage? Not necessarily. First, the phenomenon of two becoming one can be explained three different ways: (1) fusion of two into one, (2) the death of one and the incorporation of that person's material by the one that lives, as happened in the cloning of the sheep,<sup>xxxviii</sup> and (3) the death of both and the constitution of a single individual from the disintegrated parts of the individuals that died. Apparent evidence of fusion does not have to mean that two individuals became one. It could mean a death has occurred, and, of course, the death of a person does not prove that an individual person did not exist before that happened.<sup>xxxix</sup>

On the practical side, however, it has to be established that the fusion of human embryos has actually taken place before it can be used as an argument. Hellegers, Benirschke, and Jones<sup>xi</sup> each argued that it has, showing that there have been individuals with the genetic make up of two individuals, *i.e.*, 46,XX/46,XY. However Grobstein, who is quoted by Shannon and Wolter, Ford and McCormick, does not use this as evidence for recombination but simply says that recombination has been found in mice and that it could also be found in humans.<sup>xii</sup> Moreover, the embryologist, Keith Moore, while not referring to "genetic chimerism," explains that at least the mosaic characteristics in humans, such as an XX-XY chromosome make-up, is due to nondisjunction of the chromosomes at the pre-zygote and post-zygote stages or due to anaphase lagging.<sup>xiii</sup> In other words, the unusual chromosome make-up can be explained by nondisjunction or anaphase lagging rather than by fusion of a male and a female embryo. It does not seem reasonable to argue from only the possibility of recombination in humans to a conclusion that such recombination is a solid indication that the human zygote and its consequent blastomere have such an instability that it or they cannot be a person.

Nonetheless, even if solid evidence for human fusion can be presented, and more recently others have said that it has occurred,<sup>xliii</sup> this does not prove that individuality did not exist beforehand. That is, before the material was fused, the death of one or both individuals could have occurred. As we know from experience, the death of an individual does not mean that he or she never had personhood beforehand.

Neither twinning nor recombination, therefore, indicates that a stable individuality did not exist beforehand, and thus that a person could not have existed beforehand. Moreover, twinning is a strong affirmation of individuality since even with the same genetic structure there can exist two individuals, *i.e.*, not one but two individuals who have “the actual unique reality of a spiritual being, an undivided whole existing independently and not interchangeable with any other.”

#### E. SELF DIRECTION AND THE EARLY EMBRYO

The third line of argumentation against the zygote being a person is based on the notion that just as an individual human being is self-directive, there should be a biological indication of a self-direction that is continuous and centrally located. There is. The zygote has its own molecules to start operating<sup>xliv</sup> and starts producing its own enzymes and proteins at syngamy.<sup>xlv</sup> Bedate and Cefalo, however, argue that because it is the maternal mitochondria and maternal and paternal genetic messages in the form of messenger RNA or proteins in the cell that starts this shutting-off process, then we cannot say that the zygote genes are the cause of its development.<sup>xlvi</sup> However, Suarez points out in several ways that the biological identity of the human embryo is not determined by the influence of the maternal environment but depends basically on the information capacity of the embryo itself.<sup>xlvii</sup> If any thing, one might say that the paternal and maternal influences operate like gas for the engine and like its starter. They can provide certain things and get things going, but what goes and how it operates is determined by the car itself. The cell is what develops according to the direction given by the genes. The kind of information that comes from the mRNA is more like the information which parents and teachers give to their children rather than like the thinking and deciding processes of the child. So, the zygote and

not just the embryo with its primitive streak has a self-directing capacity that is proportionate to the requirement that a person be self-directing.

#### F. SUMMATION OF THE BIOLOGICAL EVIDENCE

In summary, we can say that important characteristics by which we identify a person are seen to be present from the zygote stage onward. The verified loss of human zygotes is around 31% rather than 45-58%. Most often, this is not wastage but the elimination of zygotes that would never develop. Thus, there is possibility that, of the zygotes lost, a significant number did not have the genetic structure to be the material component of a human being. But even if the loss were 58% and the genetic structure were complete, the loss does not mean that personhood never existed. It means that the person has died. Secondly, twinning affirms rather than denies individuality. Why? Because division results in two indivisible and independent unities rather than disintegrating parts. Moreover, as distinct wholes twins are not interchangeable with one another, not even in the case of Siamese twins or in the case of those twins in which one shares the placenta of the other. Third, recombination of human embryos has to be scientifically established before it can be used to argue against the individuality of the zygote. However, even if conclusive evidence were produced for saying that recombination has occurred, the death of one or both of the wholes rather than indistinctness and fusion could explain this phenomena. Fourth, the self-directing and wholeness quality needed for personhood is present in the zygote. Three facts point to this: (1) the human zygote contains both the genetic code and its activating molecules for its course of development; (2) methylation is likely taking place by the third division of cells, and (3) methylation starts off a cascading effect of shutting genes on and off which continues all during human development. Together these facts indicate that the individual zygote and its early embryo cells is a person, having a distinct and stable individuality and capable of undergoing development. In other words, the material conditions for human life and its eventual rational operations are present from the normal zygote stage onward. This is not to say that all the

functions of a human person take place from the moment that there is a conceptus. Far from it. The rational operation of a distinct self-awareness that enables one to carry on a logical process of reasoning until one comes to the correct knowledge of something is not present until years after the child is born. Nonetheless, the process of this development begins with the zygote. From a single cell many cells come. Not only do they multiply but they differentiate, develop into different tissues, then into different organs that work in harmony with one another and form a single individual. It is only a matter of time (rather than a substantial change) until one can recognize the rational operations of a person as manifest. For the reasons given above, there is strong evidence that the human zygote is a person.

#### V. THE METAPHYSICAL ARGUMENTS ABOUT PERSONHOOD

##### A. MATERIAL APTNESS FOR HUMAN SOUL AND PERSONHOOD

But what of the metaphysical arguments against the zygote being a person? There is the argument that a human soul could not be in a zygote because its material conditions would not sustain the operations of an intellectual soul.<sup>xlviii</sup> However, this argument assumes that the soul is simply a principle of human operations and as such needs organs by which to operate. But the soul is more fundamentally a principle of human life. That is, as a being in first act, the human soul is the principle of human life; only in second act does the soul become the principle of distinct operations which require organs.<sup>xlix</sup> To be a principle of human life, the soul needs only what is necessary for human life, a human genetic make-up and an intrinsic capacity to develop, namely, to divide, to differentiate, and to integrate. The zygote has these capacities.

##### B. EVOLUTION AND THE EMERGENCE OF THE SOUL AND PERSONHOOD

A second metaphysical argument, put forth by Mahoney, is that the development of the human person is like the evolutionary development of the human species.<sup>1</sup> In the human species there was a gradual transformation of primates from a pre-human to human status, so likewise there should be a gradual transformation in the human entity, from pre-human to person. Such a conception of evolution presupposes

that a major change between species can be explained by “the grand accumulation of small variations.”<sup>li</sup> However, Lonergan contends that “minor changes in the underlying aggregates yield variations within the species; major changes that are surmounted successfully yield new types of solution (at living) and so new species.” The movement from non-human to human species is a major movement. It requires two things. It requires an organization of material that the subspecies was not able to organize and it requires a power that is beyond that of the subspecies to bring about.<sup>lii</sup> In the human zygote, however, there is no new power to move it from the zygote stage to implantation stage. What starts the process of development is within the zygote cell itself. Secondly, there is no new principle of organization between the zygote stage and the implantation stage. In fact the developmental process of the zygote produces what will later become the central nervous system of the adult.<sup>liii</sup> Therefore, the changes that occur between the zygote and the implanted embryo represent the development of the human being rather than a change from non-person to person.

#### C. THE NEED FOR AN ADEQUATE ACCOUNT OF DEVELOPMENTAL CONTINUITY AND PERSONHOOD

There is one more metaphysical argument about personhood. One must account for the unified process of development and for personhood with an explanation that is least complex but which accounts for all the data. The data in this case concerns the continuous development process and the indications of the presence of personhood.

While Donceel, Ford, Bole, McCormick, Shannon and Wolter work with the process of development to postulate that a person comes into being at a point of discontinuity in the process, they do not have a simple account for the continuity of the process. Putting the argument metaphysically, Heaney says that such persons consider the material conditions apt for the soul, but they do not consider those operations that need the soul to account for them.<sup>liv</sup> Something must account for the continuity of development.

These authors have found the point of discontinuity to be at a time when twinning and recombination can no longer occur. For McCormick, this is



around the time of implantation. Shannon and Wolter offer three possibilities, at implantation, at gastrulation (about three weeks after fertilization), and at organogenesis.<sup>lv</sup> (It seems that they have not settled which material condition to pick for personhood.)

Ford, McCormick, Shannon and Wolter see twinning and recombination as evidence that personhood has not yet occurred in the process, since personhood needs “ontological individuality” (according to Ford) or “developmental individuality” (according to McCormick) or “singleness” (according to Shannon and Wolter). Ford understands “ontological individuality” to be “a distinct on-going ontological individual with a biological human nature.”<sup>lvi</sup> McCormick understands “developmental individuality” (and Shannon and Wolter<sup>lvii</sup> see “singleness”) to mean that what one has cannot turn into another thing, such as a mole or tumor, an embryo or a placenta. But their arguments for establishing this, as we have seen above, have their refutation.

It has been shown that although the act of fertilization can produce zygotes, moles, and tumors, it is not the case that any zygote could develop into a mole or tumor. So moles and tumors do not indicate that a human person cannot be present at the zygote stage of human development. It has also been shown that the embryo and placenta are not distinct things, like the mother and the child, but are one organism, with the placenta doing the work of providing nourishment in the way that the hands and the stomach bring nourishment to the total organism later on. Thus the placenta and embryo (being one organism) indicate the individual unity of personhood is possible at that point as well. Further, it has also been shown that the cells before that time do not function as loosely associated individuals, or even as a colony of independent cells but as an organic unity. This indicates that there is one individual with a single organizing principle. So personhood can be present at this time. Fourthly, it has been shown that twinning does not end individuality and preclude development, but rather that it adds another individuality or initiates a second process of development. Consequently, personhood and the existential unity that the soul brings is manifest at the zygote stage and at every stage afterwards. From the chromosomal make-up in each and every cell constituting its humanness to a stage where there is

an evident unity of being and operation that is recognizably human, the soul is (a) operating to maintain a unity of being and (b) doing so in the midst of multiple differentiations and development. So the soul accounts for both the unity of person and the continuity in the developmental process.

On the other hand, those who argue that the person originates at a point of discontinuity in development are unable to account for the unity of the developmental process that went before the so-called origin of person and the unity of development that followed afterwards. While arguing that there is a discontinuity in the developmental process in order to assert that there is a stage when personhood has not yet arisen, Shannon and Wolter recognize that they must account for both the continuous process of growth and development and for the distinctness of personhood. To account for the continuity, they speak of elements being organized in a system, which in turn activates potentialities. But then they realize that they have to account for this original system, and so they postulate some external agent for bringing this about. From this one system follow other systems. Realizing that they have to account for the interconnection of one system with another, they attribute this connection to a mysterious “operation of nature” that moves from one system to another, keeping them all together. But this operation of nature, which must transcend each distinct system in order to preserve their connections with one another cannot be identified with “the principle of immaterial individuality, which also transcends what is material, since this “principle” is needed to stand for the person, which originates at a point of discontinuity in the development. One ends up with two materially transcending realities, with nothing to account for what makes them different, and yet one of them is called upon to account for the continuity of development while the other is called upon to account for the person who arises at a moment that is discontinuous with what went before. While one thing accounts for a continuity of development and another thing accounts for the distinct unity of person, nothing accounts for the connection between them. Consequently the theory of Shannon and Wolter falls short of what is observed.<sup>lviii</sup> Heaney suggests that McCormick recognizes that there is a continuity in development, for he

writes: “Under favorable circumstances, the fertilized ovum will move through developmental individuality then progressively through functional, behavioral, and social individuality. In viewing the first stage, one cannot afford to blot out subsequent stages.”<sup>lix</sup> McCormick, however, offers no explanation for this continuity. On the other hand, both the continuity and discontinuity can be explained in terms of the soul, which is the existence-giving, life-giving and organizing principle of the human being.

Thus, the notion of soul can deal with the problem of twinning. When twinning occurs there is evidence of a new soul since the process that normally takes place with one zygote becoming one adult now takes place with two separated cells becoming adults. This answers the question of Shannon and Wolter: “How does one explain the relation of the original principle to the zygote that splits off?”<sup>lx</sup> It remains, and another soul, another life-giving and organizing principle, arises. If the soul comes only after twinning and recombination occurs, then there is nothing to account for the unity of being and development before that time. Mediate animation can only account for the latter.

As for recombination, which still needs to be proven for humans, the infusion of the soul at the zygote state, *i.e.*, immediate animation, can account both for the development up to that time and for the unity of development afterwards. Recombination implies that there is a single reality, then a split into two distinct realities, and then a joining together.

The notion of the soul can account for each stage. Above we have given an account for one becoming two in terms of the soul. For recombination this is what can happen. One of the embryos dies, *i.e.*, loses its soul, the remaining embryo by the power of its soul incorporates parts from the embryo that died. Or both embryos can die, with the departure of their souls (as happens when any person dies). Then a new soul must be given whereby it organizes the different body parts of those that died into a single working organism. Should there be two different embryos that combine, the resulting phenomena would resemble an individual who would have body transplants from genetically different individuals, which keep their genetic make-up but work as a total unity in the individual.<sup>lxi</sup> The soul would account for the living unity, not the

different genetic structures. This answers the question of Shannon and Wolter regarding recombination: “How does one explain coherently the fate of such a principle of immaterial individuation then?” Through the soul.

Personhood by way of mediate animation can only account for what happens after twinning and possible recombination. Personhood by way of immediate animation can account for what happens before, during, and afterwards. What accounts for less is less probably true. Mediate animation is less probably true.

#### VI. CONCLUSION ABOUT THE PERSONHOOD OF THE EARLY EMBRYO

Consequently, one is no longer reduced to saying, “Well, at least we have the benefit of the doubt that the zygote is a person, because it cannot be proved otherwise.” Such an argument McCormick, Mahoney, and others rightly challenged. Rather, one can say, “We have both biological and metaphysical reasons for saying that the zygote, but not the mole or the tumor, is a human person. Moreover, the biological facts about the zygote meet the conditions for determining when personhood occurs. Ironically, these are the very same conditions set and used by those who denied human personhood to the normal zygote.”

So, in addition to a genetic constitution that is different from a person's parents there are other signs indicating that the zygote has an individuality proportionate to that of personhood: a stable wholeness or unity of being and operation that is self-directing and for the well-being of the whole. It is reasonable to say that the early embryo has the material conditions that are apt for personhood. These conditions correspond with the definition of a person as a substantial being of a rational nature.

In addition to this biological data argument, this paper also presented metaphysical arguments in favor of personhood being present in the early embryo. First, the material conditions of which we speak do not have to be apt for rational functioning since these functions occur when the soul moves from first act to second act.<sup>lxii</sup> All that is needed for the soul to fulfill its first act function of giving life and organization is present in the early embryo. The embryo with its genetic and self-directing properties is all that is needed. With these the soul can function as the life principle

and go on to develop those organs by which the soul can eventually perform its second act operations such as thinking and choosing.

Second, the evolutionary phenomena that parallels the movement from zygote to adult is not the movement from one species to another, in which what is disparate and disorganized is incorporated into a greater unity. Rather, the differentiation and development within a species is what parallels the movement from zygote to adult.

Third, the theory that has a single explanation to account for signs of both discontinuity and continuity is to be preferred to the theory that can only account for either the discontinuity or continuity. Mediate ensoulment can account only for the signs of discontinuity; immediate ensoulment can account for both.

For these biological and metaphysical reasons we can say that the early embryo is not just possibly but probably a human person. If it is probably a person, then moral prudence requires that we protect and promote its welfare and forgo any action which exposes it to harm or death. Just as we should not expose an infant to a hostile environment or end its life for the benefit of a third party or do potentially dangerous and non-therapeutic experiments upon it, neither should we utilize *in vitro* fertilization, take the morning-after pill, or do research experiments on the early embryo. The infant is a person, and probably the embryo is too.

#### NOTES

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i. John S. Mahoney, S.J., *Bioethics and Belief: Religion and Medicine in Dialogue* (Westminster: Christian Classics, 1984) 85; Thomas A. Shannon and Allan B. Wolter, O.F.M., "Moral Status of the Pre-Embryo" in *Theological Studies* 61 (1990) 603-26 at 603.

ii. Lisa Sowle Cahill, "The Embryo and the Fetus: New Moral Contexts" in *Theological Studies* 54 (1993) 124-43 at 124.

iii. Boethius, *De duabus naturis*, quoted in Thomas Aquinas, *Summa theologiae* 1.29.1.

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- iv. Richard McCormick, S.J., "Who or What is the Pre-embryo?" in *Kennedy Institute of Ethics Journal* 1 (1991) 1-15 at 9, quoting Karl Rahner, ed., *Encyclopedia of Theology: The Concise Sacramentum Mundi* (New York: Saber, 1975), s.v. "Person" by Max Miller and Alois Halder, p. 1207.
- v. Aquinas, 1.29.1.
- vi. Cahill 19-20.
- vii. McCormick 3.
- viii. Norman Ford, S.D.B., *When Did I Begin? Conception of the Human Individual in History, Philosophy, and Science* (New York: Cambridge Univ. Press, 1988) 156-58.
- ix. James J. Diamond, "Abortion, Animation, and Biological Hominization" in *Theological Studies* 36 (1975) 305-24 at 5.
- x. McCormick 11-13; Mahoney 80.
- xi. Karl Rahner, S.J., "The Problem of Genetic Manipulation" in *Theological Investigations* (New York: Saber, 1972) 225-52 at 226 n.2; Shannon and Wolter 618-19; McCormick 3.
- xii. Keith Moore and T.V.N. Persaud, *The Developing Human: Clinically Oriented Embryology*, 5<sup>th</sup> ed. (Philadelphia: W. B. Saunders, 1993) 36.
- xiii. D. Wilcox, J. Allen, Clarice R. Weinberg, John F. O'Connor, Donna D. Daird, John P. Schlatterer, Robert E. Canfield, E. Glenn Armstrong, and Bruce C. Insula, "Incidence of Early Pregnancy" in *The New England Journal of Medicine* 319/4 (July 28, 1988) 189-94.
- xiv. Moore 36.
- xv. McCormick 3; Thomas J. Bole, "Metaphysical Accounts of the Zygote as a Person and the Veto Power of Facts" in *The Journal of Medicine and Philosophy* 14 (December 1989) 647-54 at 649 *et al.*, hereafter Bole (1989).
- xvi. Antoine Suarez, "Hydatidiform Moles and Teratomas Confirm the Human Identity of the Preimplanted Embryo" in *The Journal of Medicine and Philosophy* 15 (December 1990) 627-36 at 629.
- xvii. Thomas J. Bole, "Zygotes, Souls, Substances, and Persons" in *Journal of Medicine and Philosophy* 15 (December 1990) 637-52 at 643; hereafter Bole

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(1990).

xviii. Stanley J. Robboy, Marie A. Duggan, and Robert J. Kurman, "The Female Reproductive System" in *Pathology*, 2<sup>nd</sup> ed., ed. Emmanuel Rubin and John L. Farber (Philadelphia: J. B. Lippincott, 1994) 967.

xix. Paul Flaman, "When Did I Begin? Another Critical Response to Norman Ford" in *Linacre Quarterly* 58 (November 1991) 39-55 at 41, 48.

xx. Moore 33.

xxi. Flaman 44; Moore 33.

xxii. McCormick 3.

xxiii. Moore 113; Diane Nutwell Irving, "Scientific Philosophical Expertise: An Evaluation of the Arguments on 'Personhood'" in *Linacre Quarterly* 60 (February 1993) 18-45 at 28.

xxiv. McCormick 3; Shannon and Wolter 612.

xxv. Bole (1990) 638; McCormick 8, 11; Shannon and Wolter 612.

xxvi. Flaman 41; Moore 132.

xxvii. Thomas A. Shannon, "A Further Postscript to Mark Johnson" in *Theological Studies* 58 (1997) 715-17 at 715.

xxviii. *Ibid.* 716.

xxix. Shannon and Wolter 614.

xxx. Aquinas, 1.29.1.2m.

xxxi. Aristotle, *Categories* 5.15.

xxxii. *Ibid.* 5.25.

xxxiii. Walter Brugger, S.J. and Kenneth Baker, S.J., "Individual" in *Philosophical Dictionary* (Spokane: Gonzaga Univ. Press, 1972).

xxxiv. Mark Johnson, "*Quaestio Disputata*: Delayed Hominization: A Rejoinder to Thomas Shannon" in *Theological Studies* 58 (1997) 708-14 at 708.

xxxv. Aquinas, 1.29.1.5m.

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xxxvi. Shannon 716, 717.

xxxvii. Flaman 43.

xxxviii. *Chicago Tribune* (February 23, 1997).

xxxix. Flaman 45-46; John Gallagher, O.S.B., *Is the Human Embryo a Person? A Philosophical Investigation* (Toronto: Human Life Research Institute, 1985) 29-30, nn. 42-44.

xl. André Hellegers, "Fetal Development" in *Theological Studies* 31 (1970) 3-9; Kurt Benirschke, *Current Topics in Pathology* 1 (1969) 1; and Howard W. Jones, Jr. and Wilma B. Bias, "True Hermaphroditism with 46, XX/46,XY Chromosome Complement, Report of a Case" in *Obstetrics/Gynecology* 36/3 (September 1970) 377-87.

xli. Clifford Grobstein, *Science and the Unborn* (New York: Basic Books, 1988) 25.

xlii. Moore 147-48.

xliii. In a phone conversation on July 17, 1997, Dr. Howard Jones said he personally knows of twenty cases in which one can argue that fusion took place.

He sent an article indicating a number of cases of human hermaphrodites, *i.e.*, humans having not only a substantial number of XX chromosomal cells to produce female sex organs but also a substantial number of XY chromosomal cells to produce male sex organs (1970). The case he and Dr. Bias present has a 46,XX/46XY chromosome complement. While acknowledging that this can be explained in a number of ways, Dr. Jones postulates that it is due to the fusion of two embryos. He named this condition a case of "genetic chimerism," *i.e.*, the presence of different cell-lines due to different zygotes and he distinguished it from "mosaicism" in which different cell-lines originate from a common zygote (Jones and Bias 377, 382). Since neither Grobstein, who is eager to argue that recombination can occur in humans nor Moore postulate that the XX-XY phenomenon is due to fusion of two embryos, it appears that the "fusion interpretation" is not generally accepted by embryologists.

xliv. Ford 118.

xlv. M. S. Kischer, C. Ward, and Diane Irving, *The Human Development Hoax: Time to Tell the Truth* (Clinton Twp.: Gold Leaf Press, 1995) 86.

xlvi. C. A. Bedate and R. C. Cefalo, "The Zygote: To Be or Not to Be a Person" in *The Journal of Medicine and Philosophy* 14 (December 1989) 641-45.



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xlvi. Suarez 628-31.

xlviii. Joseph Donceel, S.J., "Abortion: Mediate vs. Immediate Animation" in *Continuum* 5 (1967) 167-71; Joseph Donceel, S.J., "Immediate Animation and Delayed Hominization" in *Theological Studies* 31 (1970) 776-805; James J. Diamond, M.D., "Abortion, Animation, and Biological Hominization" in *Theological Studies* 36 (1975) 305-24; Mahoney (1984); Bole (1989); Shannon and Wolter (1990); and McCormick (1991).

xlix. Stephen J. Heaney, "Aquinas and the Presence of the Human Rational Soul in the Early Embryo" in *The Thomist* 56 (1992) 19-48 at 34-37.

l. Mahoney 81.

li. Bernard J. F. Lonergan, S.J., *Insight: A Study of Human Understanding* (New York: Longmans, Green, & Co., 1957) 264-65.

lii. Heaney 26-27, 38, 44.

liii. Heaney 35; Benedict Ashley, O.P., "A Critique of the Theory of Delayed Hominization" in *An Ethical Evaluation of Fetal Experimentation: An Interdisciplinary Study*, ed. D.G. McCarthy and A.S. Moraczewski (St. Louis: Pope John XXIII Medical-Moral Research and Education Center, 1976) 113-33 at 123-24.

liv. Heaney 48.

lv. McCormick 3; Shannon and Wolter 612, 613, 624.

lvi. Ford 128.

lvii. McCormick 2-4; Shannon and Wolter 612.

lviii. Shannon and Wolter 620, 621, 622, 624, 625.

lix. Heaney 42.

lx. Shannon and Wolter 619.

lxi. Flaman 44-46.

lxii. Aquinas 1.76.4.1m; Heaney 36.