

February 2001

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### Recommended Citation

Bracken, W. Jerome (2001) "Is the Early Embryo a Person?," *The Linacre Quarterly*: Vol. 68: No. 1, Article 4.  
Available at: <http://epublications.marquette.edu/lnq/vol68/iss1/4>

# Is the Early Embryo a Person?

by

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## I. Introduction

Dr. Ian Wilmut, of the Roslin Institute, announced that in July of 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. This 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 we are ready to do more than provide a childless couple with a child, 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 so that a woman who was raped has the "right ... to a meaningful life and a healthy personality development" (Mahoney 1984, 85; Shannon and Walter 1990,

603).” They have contended that the early embryo, though genetically identifiable as human, is not a person. Thus, for certain good reasons the developmental 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 propose counterarguments for saying 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 anyone who is a human being” to “only those human beings who can think and choose are persons” (Cahill 1993, 124). Many of those who work out of the Catholic tradition use the definition of the fifth century Christian philosopher, Boethius. A person is an individual substance of a rational nature (Thomas Aquinas, 1.29.1). Richard McCormick, S.J., in his article 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” (McCormick 1991, 9; Rahner 1975, 1207). 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, a spiritual being does not mean that to be a spiritual being one cannot be material, for whereas God, angels and humans are all spiritual beings, humans are spiritual even though they are material as well. Spiritual denotes a mode of acting, rather than the absence of 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 (Thomas, 1.29.1). Insofar as this substance is a nature, having its own principle (Thomas, 1.29.1 4m), and insofar 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” (Thomas, 1.29.1).

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, that the substance is not only a whole rather than a part but also something that cannot be divided. However this is not the meaning of

“individual substance.” Thomas refers to specific meanings for each of these words. The term “substance” is used in contrast to the term “accident.” An accident is part of something else and gets its individuation by being in that particular thing (Thomas, 1.29.1). 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 we are speaking about a unity that refers to a class of things and used to affirm we are speaking about a unity that refers to the thing itself (Thomas, 1.29.1. 2m.)

The other word, “individual” also has a distinct meaning. According to Thomas it characterizes the substances as having a unity to it that is greater than the unity of nature, for whereas human nature can be assumed by the Word of God, the *individual* substance of a rational nature cannot be assumed (Thomas, 1.29. 1. 2m). Thus the word, “individual,” does not refer to the “indivisibility” of substance as such but to the incommunicability of substance.

To discover when the fertilized egg or embryo is a person, one would look for the time in 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 the fertilized ovum, the zygote, is not a person (1993, 19-20). 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 (McCormick 1991, 3), a placenta (Ford, 156-158), a human being, twins or, apparently, a recombination (Diamond 1970, 5). 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 persons like McCormick and Mahoney think 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 we have a *prima facie* obligation to treat it as a person, he, Mahoney and others are convinced that the genetic individuality of the zygote is not a strong reason for saying that the normal zygote is a person (McCormick 1991, 11-13; Mahoney 1984, 80).

But are there other reasons, besides the simple fact of its genetic individuality, for saying that the zygote is a person? The following counterarguments 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. Counterarguments 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 (1972, 226, n.2), Shannon and Wolter (1990, 618-9) and McCormick (1991, 3) 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 percent 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 (1990, 618-9).

First we need to ask a factual question. On what basis does one say the loss is great? Moore, in his latest edition of *The Developing Human*, says that "at least 15 per cent of zygotes die and blastocysts abort." But because women are unaware of pregnancy, one can say it is higher, so Moore adds another 30 percent, twice the percentage of known fetal losses (1993, 36). 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 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 two times that of the clinically known ones. But, in their study, the total miscarriages were 31 percent rather than Moore's 45 percent. This was a study in which 86 percent 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, therefore, could 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 (1988).

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. This is what Moore writes:

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 percent instead of 2 or 3 per cent of newborn infants would likely be congenitally malformed... (1993, 37).

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 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, 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 that of a person. It is as if hydatidiform moles and tumors are just cases of zygotes going bad (McCormick 1991, 3; Bole, 1989, 649 of complete moles, 1643 of partial moles). How can one say this conclusion 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 (1990, 629). Then, after about two months this mole-pregnancy ends or

progresses to a trophoblastic tumor (Ibid.). In reviewing Suarez, Bole seems to accept his conclusion that these moles did not come from normal zygotes, so what is said of the mole as being a nonperson cannot therefore be said of the zygote as such. But then he asserts that normal zygotes have developed into partial hydatidiform moles and he gives a reference to prove his point. However, the reference he cites does not indicate that normal zygotes produce this (1990, 643). Furthermore, Robboy, Duggan and Kurman report that the partial hydatidiform moles have "...69 (rather than 46) chromosomes..." which represents an "...abnormal chromosomal complement..." (1994, 967). Since the normal zygote has 46 chromosomes and the partial hydatidiform mole has 69, there is, contrary to Bole's contention (1990, 643), 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 nonpersonhood 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 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**

So 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 (1991, 41, 48). 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 (1993, 27). Methylation directs the 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 embryoblast or inner cell mass of the blastocyst (Moore 1993, 33). From these factors we can say we are not dealing with "loosely associated cells" but 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 (Flaman 1991, 44; Moore 1993, 33). 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" (McCormick 1991, 3). Rather this extra-embryonic material ends up as part of the person's gut, or urinary tract or blood (Moore 1993, 113; Irving 1993, 28). So both the unified operation and the power of the extra-embryonic material to become and remain part of the person's permanent organism 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 (1991, 3), Shannon and Wolter (1990, 612), there is a significant continuity rather than discontinuity between the zygote and its progeny of cells with their integrated and operational wholeness and 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 (1990, 638), McCormick (1991, 8, 11), Shannon and Wolter (1990, 612) 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 dividedness rather than undividedness is taking place; they are not indivisible but divisible – not so individual. Primary embryonic organization can not be taking place, they say, since that would be the time when singleness (individuality) is being established and when "the source of only one individual" is present (McCormick 1991, 9, 3).

One's first response to this argument is to say that twinning is rare, occurring on average one in ninety pregnancies (Flaman 1991, 41; Moore 1993, 132). To argue from an exception to a general conclusion about the



zygote and its consequent blastomere as 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 entity. 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, the exceptional case, would be what happens to the non-twinned cell, 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. So 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" (Shannon 1997, 715). Thus, 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 one's 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 what cannot be divided and if divided would yield only parts of the whole and not a whole. 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 (Shannon 1997, 716).

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's and Wolter's understanding of individuation for a person is that it comes from something being added on to the organism, namely, a level of development that prevents another individual from coming to be (Shannon & Wolter, 614). 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 can 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 first substance (Thomas 1.29 1. 2m), which is Aristotle's way of speaking about it. It is an entity that underlies everything else, and that everything else is either predicated on it or present in it (Aristotle 5, 15). So for Thomas the individuation of personhood does not refer to the distinguishing characteristic of an entity, the way "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 species, e.g. rational animal (Aristotle 5, 25). Rather, personhood refers to the entity itself and underlies all distinguishing characteristics, even developmental characteristics.

As for Shannon's and Wolter's inference, it 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 that Shannon and Wolter propose we do not have two alternatives but a number of possibilities, each with their 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 have more than one possibility prior to the division. One, there was no individual in the first place. Two, 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 he or she is a concrete living human being as opposed to an abstract universal "human being" (Brugger and Baker). A universal can be applied to many things, or, to borrow Mark Johnson's words, "share itself around" (1997, 708). 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 (Thomas 1. 29. 1. 5m) can we use Rahner's definition of person. It is "the actual unique reality of a spiritual being, an

undivided whole existing independently and not interchangeable with any other." But Rahner's paraphrase fails as a substitute for "individual substances," 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 on to 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, "indivisible" (1997, 717) is the positive meaning of individual. "Individual" in its positive sense does not just refer to a concept such as Scotus's "haecceitas" (716, 717). "Individual" refers to a living, self-sustaining, independent unity. Once "twinning" or "embryo division" occurs (716), one witnesses the unfolding of two individual persons. This division does not become the occasion for denying the existence of a person of the pre-implanted embryo but for affirming the existence of two persons at that stage.

#### **D. Recombination**

But isn't recombination possible and does that not destroy individuality? Not necessarily. To be sure, there is a rejoining at times, as seen in Siamese twins. But these twins, though fused, do not make one individual. They are two individuals. And in these cases doctors, many times, can even determine that a particular part used by both individuals belongs to one of the twins but is shared by the other (Flaman 1991, 43). 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, but in our present state of technology this is not practically possible. In general, however, we know that individuality is preserved, not lost, when conjoined twins occur.

Would not the recombination of two genetically different individuals into one individual demonstrate there is not 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 (*Chicago Tribune* dated 23 February 1997). (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 that 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 (Flaman 1991, 45-6; Gallagher 1985, 29-30, notes 42-44).

On the practical side, however, it has to be established that fusion of human embryos has actually taken place, before it can be used as an argument. Hellegers (1970) and Benirschke (1969) and Jones (1970) argued that it has, showing that there have been individuals with the genetic makeup 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 (1988, 25). Moreover, the embryologist Keith Moore (1993), while not referring to "genetic chimerism", explains that at least the mosaic characteristics in humans, such as an XX-XY chromosome makeup, are due to non-disjunction of the chromosomes at the pre-zygote and post-zygote stages or due to anaphase lagging (Moore 1993, 147-8). In other words, the unusual chromosome makeup 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 says such recombination is 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 it has occurred<sup>1</sup>, this does not prove that individuality did not exist beforehand. That is, before the material was fused, death of one or both individuals could have occurred. As we know from experience, the death of an individual does not mean he or she never had personhood beforehand.

Neither twinning nor recombination, therefore, indicates that a stable individuality did not exist beforehand and, thus, 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, then 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 (Ford 1988, 118) and starts producing its own enzymes and proteins at syngamy (Kischer and Irving 1995, 86). 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 the zygote genes are the cause of its development (Bedate and Cefalo 1989, 642-4). 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 (Suarez 1990, 628-631). If anything, 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 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 percent rather than 45 percent to 58 percent. 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 percent 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 the twins are not interchangeable with one another, not even in the case of Siamese twins or in the case of 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 recombination has occurred, death of one or both 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. One, the human zygote contains both the genetic code and its activating molecules for its course of development. Two, methylation is likely taking place by the third division of cells. Three, methylation starts off a cascading effect of shutting genes on and off which continue to go on 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 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 some thing 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 different organs that work in harmony with one another forming a single individual. It is only a matter of time rather than a matter of any substantial change when what are recognized as the rational operations of a person become manifest.

So, 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 (Donceel 1967; 1970, Diamond 1975; Mahoney 1984;

Bole 1989; Shannon and Wolter 1990; and McCormick 1991). 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 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 (Heaney 1992, 34-7). To be a principle of human life, the soul needs only what is necessary for human life, a human genetic makeup and an intrinsic capacity to develop, namely to divide, differentiate and 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 (1984, 81). In the human species there was a gradual transformation of primates from a prehuman to human status so likewise there should be a gradual transformation in the human entity, from prehuman to person. Such a conception of evolution presupposes that a major change between species can be explained by "...the grand accumulation of small variations..." (Lonergan 1957, 264-5). 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" (Ibid., 263). The movement from nonhuman 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 (Ibid., 262-267) and it requires a power that is beyond that of the subspecies to bring it about (Heaney 1992, 26-27, 38, 44). 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 (Ibid., 35; Ashley 1976, 123-4). Therefore, the changes that occur between the zygote and implanted embryo represent the development of the human being rather than a change from nonperson to person.

### **C. The Need for an Adequate Account of Development 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 (Heaney 1992, 48). 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 (1991, 3). Shannon and Wolter offer three possibilities, at implantation, at gastrulation, about about three weeks after fertilization, and at organogenesis (1990, 612, 613, 624). (It seems they have not settled which material condition to pick for personhood.)

Ford, McCormick, Shannon and Wolter, and others 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" (Ford 1988, 128). McCormick (1991, 2,3,4) understands "developmental individuality" and Shannon and Wolter (1990, 612) see "singleness" to mean that what one has cannot turn into another thing, such as a mole or tumor, or such as an embryo or a placenta or that what one cannot move from being one of a kind to two of a kind (one human person to two, twinning) or from being two of a kind to one of a kind (two persons to one, recombination). 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 the way 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 it adds another individuality and initiates a second process of development. Consequently, personhood and the existential unity that the soul brings is manifest at the zygote stage and every stage afterwards. From the chromosomal makeup in each and every cell constituting its humanness to a stage where there is an evident unity of being and operation, unity that is recognizably human, the soul is operating: **a)** to maintain a unity of being and **b)** doing to 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 when personhood had 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 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 connection one with 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 with two materially transcending realities, with nothing to account for what makes them different, and yet one 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, Wolter and Shannon's theory falls short of what is observed (Shannon and Wolter 1990, 620, 621, 622, 624, 624-625).

Heaney (1992, 41-2) suggests that McCormick recognizes that there is 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 (1991, 12).

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 (1990, 619), "How does one explain the relation of the original principle to the zygote that splits off?" 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 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 makeup, but work as a total unity in the individual (Flaman 1991,

44-6). The soul would account for the living unity, not the different genetic structures. This answers Shannon and Wolter's question regarding recombination (1990, 619), "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 both what happens before, during and afterwards. What accounts for less is less probably true. Mediate animation is less probably true.

## VI. Conclusion on the Personhood of the Early Embryo

Consequently, no longer is one 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 the zygote, but not the mole or the tumor, is a human person. Moreover, the biological facts about the zygote meet the 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. So 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 (Aquinas, *ST* 1.76.4.1m; Heaney 1991, 36). 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 of 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 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 nontherapeutic 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.

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1. In a phone conversation, 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 46XX/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 1970, 377, 382). Since neither Grobstein who is eager to argue that recombination can occur in humans (1988) nor Moore (1993) 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.

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