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# Why Respect for the Human Embryo?

by

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## I. Introduction

The current confusion concerning the identity and status of the human embryo arises from much ignorance of embryology and false philosophical impositions or distortions of scientific facts. One example of this type of distortion is the contradictory statements issued in 1984 by the Warnock Committee. Chapter 11 of the report states that each step in the development of the human embryo is part of a continuous process. "[B]iologically there is no one single identifiable stage in the development of the embryo beyond which *in vitro* embryo should not be kept alive"<sup>1</sup>. However in order to "allay public anxiety", the committee arbitrarily made the decision to implicitly recognize human status to embryos only after the fourteenth day after fertilization<sup>2</sup>.

Some years earlier, in 1979, the theologian Richard McCormick and the basic scientist Clifford Grobstein had employed the term *pre-implantation embryo* in an Ethics Advisory Board Meeting of the United States Department of Health, Education and Welfare. This term, and "*pre-embryo*", a later and more common term, deny embryos human status until the 15<sup>th</sup> day, when a structure called the embryonic disc appears. They claimed that the so-called *pre-embryo* is a human and "genetic individual", but not a "developmental individual" or human person. This erroneous concept was based on incorrect embryological data, namely that the outer and inner cell mass of the embryo are completely separate and independent, and that twinning occurs only before day 14. As the former NIH research biochemist and present bioethicist Dianne N. Irving indicates, both of these notions as well as other interpretations of embryology that these authors used as support for their theory have been proven false.<sup>3</sup>

Notwithstanding the misleading usage of pseudonyms such as *pre-embryo* or termination of pregnancy<sup>4</sup>, there is the undeniable biological fact that at some point each one of us was a “tiny human being”, made up of one cell, unrecognizable by others, yet human.<sup>5</sup> The developing human being receives various names such as zygote, morula, blastocyst, embryo and fetus. These describe the path that each one of us followed to become a newborn baby, a child, a youth and finally an adult. The contention of this paper is that it is never ethically, legally or scientifically acceptable to harm or destroy human life at any moment in its development.

In the 1980s and 90s a great deal of research was done with animal genetics and human genetics. At the close of the 20th century, scientists made some significant discoveries concerning the so-called human embryonic stem cells and began numerous research projects directed to potential therapeutic applications. The procurement of these cells, however, entails the destruction of human embryos. The following is a discussion of ethical and scientific reasons that defend the dignity of the human embryo and proscribe its destruction under all circumstances.

Stem cells are cells that can differentiate into cells of many different types (cell lineages) and therefore different organs or they can divide and create additional stem cells (self-renew). Their capacity to differentiate into a large variety of cells or sometimes into a new organism is regulated by a complex interaction of many cellular signals and growth factors. Stem cells are divided into embryonic cells which under certain conditions are totipotent<sup>6</sup>, and adult stem cells that are relatively undifferentiated and pluripotent. The latter were known to exist in skin, intestine and blood tissue that is continually regenerating. Contrary to prior belief, it has been shown that the central nervous system also has stem cells.<sup>7</sup>

In addition, these organ-specific stem cells have “plasticity”, that is, the capacity to differentiate into types of tissue other than the one of the organs in which they are found. In other words they are truly “pluripotent”. In animal studies, adult bone marrow stem cells have been transformed into liver cells<sup>8</sup>, and adult neural stem cells have been transformed into blood cells.<sup>9</sup> Under the right stimulus from substances called growth factors, these cells can differentiate into cells of a different type than those of the organ in which they are found.<sup>10</sup>

In the past decade there has been a great deal of research with animal embryonic stem cells in search of future therapy for major illnesses. Two basic models have been considered, namely the substitution of damaged cells or their repair with stem cells such as in Parkinson’s Disease, and the production and transplantation of organs. The source of these cells would be adult stem cells from the patients themselves, or unethical sources such as embryos produced for in vitro fertilization; fetuses aborted for this purpose, and cloned embryos.

## II. Establishing when an Embryo is a Human Individual/Person

Human life is the foundation for all other goods in society; all spiritual goods such as freedom of speech, happiness and friendship, and the material ones such as health and private property presuppose life. The personal individual life of men and women is the *sine qua non* for all the other institutions in society such as family, religion and law. This is one of the reasons why the individual human being deserves the utmost respect and protection from its very beginning to its natural end. The ultimate reason, however, for the absolute inviolability of innocent human life is the universal religious belief that "Human life is sacred because from its beginning it involves the 'creative action of God' and it remains forever in a special relationship with the Creator, who is its sole end".<sup>11</sup> The following is an outline of ethical arguments that serve to uphold the personal character of the human embryo and the dignity that it deserves. They offer a marked contrast to the utilitarian views justified by the so-called bioethical principle of autonomy, and incorrect notions of beneficence and justice.<sup>12</sup>

The **preservation of human life** is an obligation universally accepted that is based on society's awareness of the individual's dignity and the need to protect the highest goods. Even in the case of doubt as to the moment the embryo is a human life, presumption should favor the party at risk, in this case the embryo. Furthermore, the very fact that the unharmed embryo develops into a fetus and later into a full-grown baby and eventually into a human adult confers to the embryo the highest respect.

The destruction of an individual human being/person at its origins, regardless of the stage constitutes a grave offense against the individual who is in the process of development towards becoming a future citizen and against society whose role it is to safeguard its members. For this same reason the extraction of cells from a human embryo with its consequent death is a gravely unethical act. Good intentions such as research or medical treatment of other humans do not alter the gravity of destroying a developing human being. To proceed otherwise would be to consider early stages of human life as dispensable biological material.

The above considerations presuppose the belief that a human embryo is a human person from the time of the penetration of the sperm into the oocyte, until recently universally referred to as the moment of conception. We shall now take one step back to discuss the very important and implicit question: When does a human embryo become a person? The answer to this question has a decisive significance because it provides the rationale for the respect or abuse accorded to human embryos.

Some researchers, who attempt to sanction research with ESC's, espouse the use of embryos before the second week of life by classifying

them at this point as mere human tissue. A few contemporary authors have revived the theory of delayed personhood which would justify the use of embryos before day 14 after fertilization.<sup>13</sup> As in the case of abortion, they introduce an arbitrary distinction between so called mere "human tissue" and a human embryo based on the **duration of the existence of the embryo**. This classification, which is convenient for practical purpose of researchers, does not represent any real substantial change in the developing human embryo as far as organ development or external appearance. If the human being is defined by the set of organs a normal child has and its physical appearance, the human embryo is no more or less human on day 15 than on day 14. A more coherent although flawed argument would hold that the embryo is human when it has a brain. According to this logic, since the neural tube<sup>14</sup>, the structure that gives rise to the brain is complete on day 28, one could only speak of the human embryo after the fourth week of gestation. This shows the arbitrary and untenable case for the 14 day criteria<sup>15</sup> that can only be conceived as a justification for early abortion.

The inviolability of human life is supported by the embryos' **independence from the mother**. Recent findings show that the zygote assumes control of the whole morphologic process from the earliest stages.<sup>16</sup> By zygote we understand the one-cell embryo that begins to exist when the fusion of the sperm and the oocyte membranes.<sup>17</sup> As early as the four to eight-cell stage there is human gene expression. The embryo becomes active in the process of controlling the production of new proteins.<sup>18</sup> The development of the embryo is the result of a highly coordinated and hierarchical interaction between different classes of genes.<sup>19</sup> The human embryo has a basic genetic and constitutional independence from its mother. It is another human being that expresses physiological signals to the mother's organism to continue pregnancy.

However, in another sense, this criterion is inadequate because until the day of birth the fetus remains dependent on the mother for its nutrition, protection and development. In the womb there is an intimate spiritual and biological coexistence between the two. As pregnancy advances, the physiological demands on the mother's body increase and the emotional and spiritual bonds between the fetus and the mother become more explicit. This intimate relation speaks eloquently of the presence of another human being. Furthermore, at birth, the child becomes more vulnerable given his direct contact with the outside environment, and therefore more dependent.

The presence of the zygote's **new genetic constitution** is one of the most decisive arguments in the defense of the individual and human character of the embryo. At the final stage of fertilization the genetic material from the mother's ovum and the father's sperm are joined. This fusion of the pro-nuclei gives rise to a distinct and complete code of genetic information.<sup>20</sup> This human genome formed by the re-arrangement (crossing-

over) of the 23 paternal chromosomes with the 23 maternal chromosomes constitutes a new one cell human embryo with 46 chromosomes which is undeniable evidence of a new human being. If aided by the nutrition of the mother and left uninterrupted in its course, this form of human life will follow a continuous development into a human baby. A clear sign of the continuity between the zygote and the resulting baby is the same exact genetic composition present at the moment of fertilization that remains until the natural moment of death of the adult human being. What was a unique human being in its origin continues to be the same being, albeit in a different stage of life. The potentiality of the embryo is not a pure possibility, but the intrinsic and natural capacity of a very small human being that has begun to unfold its morphological and physiological characteristics.<sup>21</sup>

This is not tantamount to equating the essence of a human being to a complete genetic code. The individuality of a particular whole organism depends not only on its genome but on its life principle which gives the genome life, that is, the spiritual soul. Philosophical and religious enquiry tell us that the structure of the human being is the special union of body and soul; the human being is a body animated by a rational soul, the non-material principle of life. In addition, each human being needs physical, social and spiritual assistance from its environment to develop into a full-grown human. However, since the spiritual element or soul that pervades the corporeal dimension of a human being is undetectable by means of biological sciences, it is the embryo's DNA that serves as an indication of the presence of each human being at its origins. The new, complete and unique genome constitutes an indisputable biological sign of the presence of a new human being/person.

A closer analysis of embryology shows that a human individual begins to exist even prior to the fusion of the pro-nuclei which occurs at the latest stage of fertilization. In earlier stages of fertilization, once the sperm penetrates the oocyte and the membranes of the sperm and the oocyte are fused, the germinal cells cease to exist as individual cells. A new one-cell organism is formed which is the human embryo. This occurs approximately 20 hours prior to the formation of a new genetic constitution. During this time the new one-cell human embryo completes the division and formation of a mature oocyte; and the nucleus of the sperm enlarges to form the male pro-nucleus.<sup>22</sup>

The timing and nature of the animation of the body are philosophical and theological questions that pose many difficulties. They are questions of great interest and consequence because they bear on the very essence of the human being and the subject of personhood. Embryological data today supports the affirmation of the existence of a new human embryo at the moment of penetration of the sperm into the oocyte.<sup>23</sup> The Catholic Church

teaches that although there are still issues and terminology to sort out, there is clear presumption that the spiritual soul is present from the beginning of the new human being and therefore we cannot act in any way to harm a developing human person.<sup>24</sup>

The argument in favor of the existence of a human soul and corresponding personhood from the moment of conception or first stage of fertilization follows two premises. The major premise is that a newborn is a human person with a life principle or soul. This is based on the philosophical reasoning that specifically human functions can only be produced by a human being who, as such, possesses a spiritual soul.<sup>25</sup> The minor premise is that there is an indisputable continuity between the penetration of the sperm into the oocyte, the development of the embryo, the growth of the fetus and the birth of a baby which is verified by direct biological observation. The conclusion is that the unicellular embryo also has a life-principle since it displays an uninterrupted continuity with the newborn child. In other words, the newborn baby, considered a human person because of its spiritual soul, must also have had a human soul at the moment of conception.

This recognition of the existence of a human soul at the moment of sperm penetration and the fusion of the germinal membranes expands the exclusively mechanistic and genetic view of biology that asserts the embryo comes into existence only at the fusion of the male and female pro-nuclei. The initial penetration of the sperm in the oocyte marks the appearance of the new life-principle which is the motor for the formation of the pro-nuclei and their later fusion. From this moment on there exists an inviolable human person in its earliest stage of development.

The sperm's penetration of the oocyte's *zona pellucida* (outer coat of the oocyte) initiates the activity of a new individual cell which functions as a unicellular organism. Significant evidence of the activity of the unicellular embryo is the second meiotic division of the oocyte and the transformation of the sperm nucleus into the male nucleus. All this takes place prior to the configuration of a new set of 46 chromosomes, 23 maternal and 23 paternal, until recently considered the moment of conception of a **new human individual/person**.

The female and male gametes are "two cells, extraordinarily endowed and teleologically programmed."<sup>26</sup> From the moment of the fusion of the two cells, prior to the formation and fusion of the male and female pro-nuclei (when the sperm is engulfed by the oocyte) they become one unit, a new being that is "intrinsically oriented and determined to a definite development."<sup>27</sup> The presence of a unique genetic constitution however, remains an important and widely acknowledged criteria to establish in a verifiable manner the existence of a new human being.<sup>28</sup>

The one-cell embryo begins to operate as a unique system that protects itself as a new being. One of its first activities is the secretion of hydrolytic enzymes leading to the inactivation of sperm receptors in the *zona pellucida*, to the hardening of this same structure and the prevention of its adhesion to Fallopian tubes.<sup>29</sup> Hours after the penetration of the sperm into the oocyte the male and female nuclei unwind through a complex and coordinated mechanism, and through the second meiotic division their chromosomal content is divided in half. At approximately twenty hours the pro-nuclei fuse producing a new nucleus with the genetic information for a completely unique human being/person. Shortly afterwards, the chromosomes align in an orderly fashion and are distributed with cytoplasm in preparation for cleavage into the two-cell embryo.

In conclusion, at the one-cell stage the human embryo is called a person because from the moment of the penetration of the sperm into the oocyte it displays some functions of a new human person which correspond to the metaphysical composite body-soul. A few hours later, the new human person consolidates its unique genetic identity with the crossing over of maternal and paternal DNA.

### III. Ethical Reasons for the Inviolability of the Human Embryo

**Beneficence** is one of the primary precepts of natural law all too often limited in common usage to feeding and clothing the destitute. It is in fact, a more encompassing ethical principle of social behavior that prescribes actions of service (from the latin *benefacere*, to do good) and an attitude of goodwill towards the other members of the human race, regardless of their origin, sex or age. This principle is founded on man's social nature manifested in his need to communicate with others and to unite with them for the establishment of societies in pursuit of other basic needs such as protection, nutrition and procreation. Beneficence is among the first self-evident moral principles summed up by the universal maxim of human behavior: do good and avoid evil. Children learn it spontaneously unless they are deformed through bad example and repeated abuse. Religions reinforce this principle by teaching the higher precept of charity, which has a supernatural origin.

The common good of society demands the protection of its weak members, especially the innocent, the young and the elderly. As is evident by the Oath of Hippocrates, some physicians in the 6<sup>th</sup> century B.C., adopted an ethical code of conduct consonant with this idea. They were in opposition to the then Greek and later Roman practice of abortion and infanticide. Even though Aristotle accepted the practice of abortion, he did it based on the rudimentary knowledge of physiology at his time which failed to establish the fetus' capacity for sensation. The famous philosopher



expressed his position as follows: “[A]bortion should be procured before the embryo has acquired life and sensation; the presence of life and sensation will be the mark of division between right and wrong here.”<sup>30</sup> In another ancient Greek oath, taken by devotees of a temple dedicated to Dionysius, the use or promotion of contraceptives, abortion or infanticide was proscribed.

There are many texts from the first four centuries of the Christian era in which authors condemn the malice of taking the life of the fetus. Although they were Christian, their arguments were based for the most part on natural ethics. Ignacio Carrasco summarizes the principal arguments advanced by them: (1) the embryo is a human being who develops in different stages to manhood and whose destruction is an “anticipated homicide”; (2) parents do not have absolute rights over their children; and (3) lack of respect for the unborn child and consequent attacks are degrading behavior that render inhuman the agents of such acts.<sup>31</sup>

The scientific data on the developing human embryo discussed above elicits an **attitude of maxim respect** for this stage of nascent life. Recent research on the first few weeks of life reveal great beauty, enormous complexity, order, unity and purpose in the developing human embryo. Whereas respect for all created beings and things is an innate human response to creation, respect for the human embryo is founded on a higher consideration: every stage in the life of an embryo is directly oriented towards the growth of a new member of the human race.

The value of the human being must not be reduced to a pure biological or economical value. This biological reductionism characteristic of late 20<sup>th</sup> century science ignores the non-material dimensions of man, such as cultural and artistic expressions, and in the end denies man’s freedom and capacity to know the truth. The experimental or therapeutic use of human embryos for the sake of other persons destroys **human life in its first stages**. This entails a very serious disregard of human dignity with all its consequences for the whole social order. When the human blastocyst is considered biological material for lab research, human life at its origins becomes subject to selfish and arbitrary ideological, economic and political programs. Behind the current practices one can uncover powerful economic interests driving science and legislation to obtain greater benefits. As a result many ethical limits are disregarded, science runs the risk of becoming an ideology as in 20<sup>th</sup> century totalitarian regimes, and laws lose their inherent orientation towards the common good of society.

The proliferation of pseudo-scientific arguments appearing in literature calls for a brief exposition of salient features of the embryo’s development which offer conclusive evidence of the presence of nascent human life. The newly formed zygote undergoes a highly coordinated and rapid cell multiplication under the control of a large number of genes directing the

synthesis of enzymes and other proteins.<sup>32</sup> During this period the cells maintain very close communication through *tight junctions* and *gap junctions* that allow for rapid intracellular transfer of ions and signal molecules.<sup>33</sup> Another important process carried out by the blastocyst is termed *polarization*. It involves the redistribution of cellular structures and the separation of two different types of cells that arise from the fourth division cycle, the trophoblastic cell line and the embryoblastic cell line.

These two cell lines differentiate into various tissues, namely the mural and polar trophoblast, the primitive ectoderm and the endoderm giving shape to the blastocyst made up of 64-128 cells. When the blastocyst reaches the uterus it adheres to endometrial epithelium, and an active interplay between it and the ovary begins. Both secrete in a synchronized manner many proteins that allow the implantation of the embryo in the uterus. The ovary produces enzymes that digest the *zona pellucida*, modify the endometrium and facilitate implantation. The embryo produces various hormones that favor the permanence of the corpus luteum (in the ovary so that it continues to produce progesterone) and that assist the three-stage process of implantation (apposition, adhesion and penetration).<sup>34</sup>

During this time, many changes take place in the blastocyst such as the development of a bilaminar structure called the embryonic disc, the growth of the *chorion* or fetal part of the placenta and the appearance of the *primitive streak*. The latter develops from one end of the embryonic disc and gives origin to the mesoderm. The blastocyst now has three main layers of cells, (ectoderm, endoderm and mesoderm) that will give rise to all the different organs.

The embryonic disc is a highly structured complex of many thousands of cells that in the early stages of development of the new human being represents a "unique whole" and carries out the general body design of a new human being.<sup>35</sup> At the fifth week of gestation when the embryo is less than 1 cm., the primitive brain, heart, pulmonary, gastric-enteric and urinary systems are present and the sexual differentiation begins. By the sixth week the primordial limbs are visible. In the development of the embryo we discover tremendous order, regularity and coordination to maintain the unity of a new living organism.

Angelo Serra, an Italian embryologist, points out that abundant data from embryology reveals three properties in the development of the embryo, namely coordination, continuity and graduality.<sup>36</sup> The coordination of molecular and cellular activities by a new genome is modulated by an uninterrupted cascade of signals from cell to cell and from the environment of the cells to the individual cells. According to Serra this requires a precise unity of being in the developing human. He concludes that the embryo is not a cluster of cells, but a real individual in whom cells are strictly integrated in a unified and autonomous process.

The embryo's development is marked by an uninterrupted succession of events that start from the moment of the penetration of the oocyte by the sperm. This continuity implies the oneness of the new human being, who having the same life-principle, passes through numerous complex stages of development, and remains the same identical human being. The final development of the embryo is reached gradually through many steps that are always oriented in the direction of a final form obeying a constant of the reproductive process known as the ontogenetic law. These properties serve to defend the embryos' status as a new real human individual. The embryo is not a potential human individual, because from the moment of early stages of fertilization it is unfolding these properties that, given all necessary conditions, will allow it to autonomously display its proper potentialities.

The virtue of **justice** is an absolute condition for authentic peace in society. According to the formulation of Ulpian, a 3<sup>rd</sup> century jurist, it consists in giving each person what is due to him or her. Life, respect and freedom are some of the basic goods that human beings are entitled to by their very existence. As members of a society, persons are entitled to these rights and bear corresponding responsibilities. Once a human being is conceived by his parents, he acquires a right to existence that entails the safeguard and respect for every moment of development of his life. That respect cannot be based on age, talent or family background because this would mean that people would receive different degrees of respect according to external circumstances, and on the same account could be denied important goods by the arbitrary decision of society.

Justice safeguards a human being's free decision to participate or refuse participation in medical experiments and treatment. It would be a serious crime to allow anyone to undergo life threatening experiments for the sake of research or the medical treatment of others. There is a growing general consensus that human beings should not be discriminated against on the basis of physical development, race or religion, and much less used as guinea pigs for lab work. Research with blastocysts, embryos and fetuses introduces precisely this grievous abuse of one class of human beings. It is especially grave because it destroys innocent and defenseless human beings, in completely dependent stages of development.

Numerous crimes and atrocities committed against innocent people throughout the history of humanity have led international bodies to issue declarations that invoke the protection of the rights of human beings. The United Nation's Universal Declaration of Human Rights begins by affirming that the recognition of the inherent dignity, and equal and inalienable right of all members of the human family is the foundation for freedom, justice and peace in the world.<sup>37</sup> The World Medical Association Declaration of Helsinki states that "Biomedical research involving human

subjects cannot legitimately be carried out unless the importance of the objective is in proportion to the inherent risk to the subject."<sup>38</sup> It stipulates that no person should be conscripted for research without legitimate consent. Much less should we create a **sub-class of human beings** to be sacrificed for the potential benefit of others.<sup>39</sup> By accepting a de-humanized society, the initial beneficiaries would in turn suffer disregard or injury to their own dignity and rights as human beings. An unrestricted quest for scientific progress breeds a spiral of injustice and abuse that turns on itself destroying the vital principles of justice and freedom in society.

A proposed United States Senate bill for federal funding of research with embryos would allow the government to procure, and therefore "own," a vast supply of living human embryos. Senator Sam Brownback who leads the opposition to this bill testified that "the notion of 'ownership', particularly by the Federal government, of other human beings is deeply disturbing."<sup>40</sup> The bill would provide federal funding for destructive research using embryos created by cloning, as long as this does not result in "the reproductive cloning of a human being", but the next step is to allow the cloning of humans. "This means that live embryos created by researchers can be experimented on and destroyed, but allowing them to survive to live birth is prohibited. The bill defines a new class of human beings who, under the law, will simply not be allowed to live."<sup>41</sup> More recently the National Institutes of Health has issued guidelines for federal funding of embryo research, approved by President Clinton, that will attempt to side step passage of the bill through Congress.

In the last decades, the need for organ donation for transplantation opened a debate on the production of human fetuses for the harvesting of human organs. This proposal was rejected as unethical because of the inherent destruction of human life. Nonetheless, some scientists and business executives who have no respect for unborn children aspire to do this very procedure and are pressuring the British government to pass a law allowing the cloning of humans for this purpose. The idea behind tissue transplantation involving ESC's from human blastocysts is similar; it involves the use of human beings as means to an end. It is the willful production and elimination of human beings for the use as "objects" by others.

A basic tenet of most world civilizations is **the sacredness of human life**. In these civilizations man is considered above all a religious being, and worship of God constitutes a primary human act and obligation. Mankind has had an awareness of the "goodness" of life and the natural world, and has perceived that its origin is external to itself. Created life proceeds from a source referred to as "divine" which transcends ordinary material reality. Thus, acts of gratitude and atonement have been considered from the most

primitive civilizations to the most advanced as the expected response of mankind to the Deity or deities.

Members of society look at human life with a sense of awe. They recognize in it a special goodness and excellence that is not found in other beings and that is inherent to each human being. This quality of human life is conferred upon it by the immortal spiritual soul directly created by God at the moment of conception, and the soul's continued relation with God. The goodness and dignity of some human beings, such as the unborn, the newborn or persons in coma, who do not seem to act in good or noble ways, proceeds from God and the human being's destination to God. People have an innate respect for the human life that surrounds them because they sense that its goodness is an expression of God's goodness and perfection. "The excellence of each individual human being is then to be understood as fundamentally participatory, that is, it shares in that alone which is of its nature excellent and noble and true and beautiful: God Himself."<sup>42</sup>

Respect for the sacredness of human life derives from the awareness of this goodness experienced in the relationships established with other members of one's species, but in the first place it comes from an understanding that human life is spiritual life eternally related to God. As such it is an exclusive prerogative of God, who is the Creator of the World and all human life. No one is able to give life to himself and no one is able to command his or her life into existence. It can only be received as a gift from another; in the case of a human being, it is a gift from God in which the parents have a direct and primary participation. The adjective "sacred" is employed to describe this life because it refers to a person or an object set aside on the basis of a very special relation to God. In view of this relationship with God and its natural end, human life from its initial stages deserves utmost respect. It should have the most special treatment and be recognized as inviolable.

The first cries of a baby awaken great joy and wonder, precisely because life is always a gift; it is never something that can be presupposed or taken for granted. This sense of mystery arises from the understanding that human life is substantially different from inanimate objects. Some other signs of the recognition that human life is altogether different from other animal forms of life are distinct social behaviors that have a spiritual and rational character such as man's quest for political peace, society's respect for pregnant women, and burial rites.

As predicted in science fiction novels, natural scientists devoted to an atheistic ideology have seriously weakened the belief in the sacredness of human life. At the close of the 20<sup>th</sup> century, an untempered desire for knowledge and the powerful development in biological technologies has produced a new intoxicating belief in unlimited progress. Important advances in genetics and robotics, together with an enormous computing

power, have opened “the opportunity to completely redesign the world, for better or for worse: the replicating and evolving processes that have been confined to the natural world are about to become realms of human endeavor.”<sup>43</sup> The capacity to produce life and to alter its development has removed the notion that life is still a mystery as far as its origin is concerned and that its composition is more than DNA and molecules. In the face of this new self imposed scientific totalitarianism, natural theology reminds us that human life remains sacred because it bears God’s design – his image – and that it is He who maintains in place the phenomena of nature described by the rules of physics and biology. However, once the notion of the sacredness of human life is removed, all ethical limits on research are ignored.

As a painting reflects the personality of its painter, created beings reflect the likeness or characteristics of their Creator. The likeness or mirror-image of human beings to God is manifest in their perfections, namely the capacity to reason, to love, and to exercise freedom. But even before the person can develop these functions in virtue of its potentiality, it is already what it is, a “human being”, because it shares in the greatest and most basic perfection, “being itself”. If these capacities are absent due to illness or social privations, he or she is no less a member of the human species. That human being is an underdeveloped or impaired member, but nonetheless a unique member of the human race.

The reverential attitude towards human embryos as the start of true human life has been eroded by the unethical disposal of countless embryos in fertility clinics throughout the world. Embryos have been destroyed or stolen; some have been implanted in surrogate mothers hired by persons who are mentally or socially incapable of being good parents. Embryos are created from the semen of children or men who have died, and at least one embryo has been implanted in a woman sixty-five years of age.<sup>44</sup> In doing so, some children are intentionally conceived and brought to life virtually as “orphans” to satisfy the fantasies of irresponsible adults. The sacredness of human life at its beginnings has been seriously undermined by these and many other bizarre and unacceptable practices.

In the United States this has been made possible by the notorious absence of ethical standards and legal regulations, and the interests of a four billion dollar infertility industry.<sup>45</sup> Laws are desperately needed to safeguard justice for the unborn and their lives as future citizens. In June, 2000, the Italian Parliament defeated a bill that would have done precisely this. The proposed Italian law defended the dignity of the human embryo by restricting *in vitro fertilization* to stable couples and prohibiting the creation of more than three embryos at a time. Although the morality of this practice is also questionable, it would have introduced a legislation

restricting current abuses. According to this same bill all three embryos would have to be transferred to the mother and given a chance to develop.<sup>46</sup>

Already biological selection of fetuses is taking place on wide scale through abortions based on the results of ultrasound and amniocentesis fluid analysis. Since technology for embryo selection already exists and is in use, embryo selection has now begun one stage earlier. With gene amplification techniques, embryos created in vitro can be analyzed for mutations and destroyed if genetic defects are detected. Molecular engineers, political leaders and insurance companies are playing God and deciding which persons may have a life "worthy of living."<sup>47</sup> In so doing, they are repeating in a sophisticated manner the dehumanized practice of the Nazi doctors who eliminated any newborn infants with genetic or congenital diseases.

The destruction of embryos for stem cell research and embryonic stem cell transplantation is now being carried out at some university research facilities, presumably with private funds. This practice and the absence of laws that prohibit it are contributing to anesthetize the conscience of researchers and to persuade the public that embryos are disposable biological material. As demonstrated by recent developments in England, this treatment of human embryos is breaking down the remaining ethical and social barriers to the genetic engineering of human beings.

Finally, **membership in the human race** evokes by degrees a spontaneous awareness of the goodness of other humans and the natural bond that exists between them. Belonging to the human race automatically elicits in its members respect for others "in as far as members" of this race. The biological and social identification between members provides a sense of "oneness" that is strengthened by common needs and heritage. The sharing of the same human condition entitles them to share in human rights and responsibilities that are perceived as inherent because they are not bestowed by other humans, but by God Himself.

Early Christian writers firmly condemned abortion, common in Greek and Roman society.<sup>48</sup> One wrote: "Love your neighbor more than your own life. Do not kill an unborn child through abortion, nor destroy it after birth."<sup>49</sup> The reason for his injunction is the laws of God, the creator of mankind whom all persons are called to reverence and obey. Divine law proscribes any purposeful damage to innocent human life and to the dignity of any human being. Furthermore, God's revelation to mankind teaches that Christ is the invisible image of God the Father who restores the image of God in men and women. Homicide is in direct opposition to God's creative and redemptive plans.

Minucius Felix, a Roman lawyer, spoke of the fetus as a *futurus homo* and compared abortion to the behavior of Saturn who did not abandon his children but devoured them. Between the years 197 and 206 another famous lawyer, Tertullian, a convert to Christianity, repeatedly denounced abortion

and infanticide. For him the destruction of a fetus is a true "anticipated homicide" because it is already a man, and at the same time in the process of becoming one.<sup>50</sup>

Although acceptance of natural equality among men has not been universal in time and place, some false beliefs in the inequality between men have been corrected over time. A poignant example in world history is the proclamation by Pope Paul III, (*Sublimis Deus*) in 1537 of the rational nature of the American Indians recognizing their rational character and human status. In 1571, the Spanish Crown reaffirmed this teaching through the famous Laws of the Indies (*Leyes de Indias*) and established numerous laws defending the rights of the Indians. Another milestone in respect for human beings was the 19<sup>th</sup> century emancipation of slaves, first in England, and then in the United States.

The universal recognition of the innate **dignity of human life** in national and international laws represents a major accomplishment of the 20<sup>th</sup> century. This protection of individual life derives from the belief in the essential dignity of every human being because of its membership in the human race. It is the central idea that has been at the origin of slave emancipation, universal suffrage and civil rights legislation. International human rights laws stand on the conviction that when the dignity of one individual is assaulted, all are threatened.<sup>51</sup> The World Medical Association's Declaration of Helsinki and the United Nations Universal Declaration of Human Rights are important international charters that attempt to safeguard future generations from the horrendous crimes against humanity carried out during the 20<sup>th</sup> century, often under the very name of human, social or scientific progress. Ironically, however, after these achievements, a subtle and more widespread type of slavery has arisen that pursues the cloning of human beings to be used by others as mere objects.

The defense of the human being from the moment of conception to the moment of natural death demands urgent social recognition and legal safeguards. If the dignity and inviolability of the unborn, regardless of its size or stage of development, and of the elderly are not upheld, then the dignity of human beings of different creeds and social backgrounds is once again placed in jeopardy. The eugenics mentality cannot convincingly answer the questions raised against it: Why are some humans "worthy of respect" as humans and others not? Which human beings should receive a lesser degree of respect on account of their physical or genetic constitution and who will decide? Should membership in the human race be subject to political, social or economic motives?

The utilitarian notion of the human person inherent to the atheistic materialism that was the mainstay of capitalist individualism and socialist collectivism has been seriously criticized. Both classical and contemporary Western philosophy offer different models that sustain a deeper



understanding of the human being and his or her participation in society. They put forth a renewed concept of the dignity of the human person with a return to the classical philosophy of being. These traditions of thought uphold the unequivocal affirmation of respect for human life in all its stages in light of membership in the human family and the design of God, the Creator of mankind. These conclusions, which are readily perceived by common sense, are strengthened and often guided by religious principles. They have furthermore been ratified by legal and ethical norms during the last five centuries. Any concessions to expediency or scientific reductionism are tantamount to the defeat of this acumen of right political order and human wisdom.

### III. Advances in Scientific research

In the last two years, new findings with adult stem cells in animal studies have raised the hope of future stem cell therapies in humans that will not require *in vitro* production of human embryos or their cloning and subsequent destruction. A recent review by John Meyer indicates a number of such studies that have been performed to discover new ways to repair and regenerate human tissue employing autologous (a patient's own) stem cells.<sup>52</sup> This research not only maintains the absolute respect due all stages of human life, but it offers benefits over embryonic stem cell research such as the avoidance of possible tissue rejection.

Some ground-breaking studies are revolutionizing previous ideas concerning the potential of adult stem cells, the knowledge of which was primarily limited to skin and bone marrow tissue. In addition, bone marrow stem cells have been shown to have a plasticity as of yet unrecognized. These cells have produced muscle tissue, a finding which opens future areas of research in genetic disorders such as **muscular dystrophy**.<sup>53</sup> Researchers have shown that blood stem cells can produce mesenchymal tissue such as cartilage, fat and bone thus bolstering interest in tissue replacement research for patients with osteoporosis and cancer.

In the field of neurology, adult stem cells from nerve tissue have been isolated and used in the treatment of rats and monkeys with **Parkinson's Disease** obtaining good initial results.<sup>54</sup> The latter and other recent findings have begun to change the long held belief that only embryonic stem cells have the capacity to form a large variety of human tissue. As a result, new fields of research for treatment of Parkinson's Disease, Alzheimer's and spinal cord injuries are also opening up at the start of the new millenium. One such therapy would involve the production of neural cells from a patient's bone marrow for the treatment of Parkinson's.

In conclusion, human embryology supports the assertion that from the moment of the penetration of the sperm into the oocyte a new unicellular

human organism is formed which begins to direct the formation and later fusion of the male and female pro-nuclei. On the basis of the biological continuity from this early stage of fertilization to the birth of a child, we can infer that from the start God bestows a life-principle or spiritual soul to the new one-cell human embryo, which appropriately receives the name of person.

In consequence, the destruction of a human embryo is totally unacceptable on ethical and medical grounds, as well as legal and religious ones; it is the destruction of an innocent human person. The main universally accepted ethical reason for an attitude of respect for the embryo is the fact that, from the one-cell stage, the embryo displays a complete and unique human genome which if uninterrupted will develop in a gradual and continuous manner. As such, the embryo is a tiny human person and a member of the human race. The human embryo is a future adult and citizen who merits equal respect and protection from society.

In addition, modern-day physiology manifests more clearly than before the beauty, order and perfection of early stages of human life, traits that silently witness to its sacredness and dignity. These inherent perfections of human beings beckon for an unambiguous ethical and legal defense of all human embryos. Furthermore, recent scientific research points to alternative methods of obtaining human stem cells for the repair and regeneration of human tissue that convert the destruction of human embryos into a more grievous and futile practice.

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2. "Despite our division on this point, a majority of us recommend that the legislation should provide that research may be carried out on any embryo resulting from *in vitro* fertilization, whatever its provenance, up to the end of the fourteenth day after fertilization." *Ibid*, p. 65.
3. Irving, Dianne N., "The Woman and the Physician Facing Abortion: The Role of Correct Science in the Formation of Conscience and the Moral Decision Making Process," Paper delivered at the Scientific Conference "The Guadalupan Appeal", Mexico City, Mexico, October 28, 1999, p. 17-18.

4. The medical literature does not employ the term *pre-embryo* or support this concept. However, as Dianne Irving indicates various ethicists and committee members who wrote the 1994 Human Embryo Research Report for the NIH ignore embryology textbooks and endorse the notion of *pre-embryo*. See Irving, Dianne N., "When do Human Beings Begin? 'Scientific' Myths and Scientific Facts," *International Journal of Sociology and Social Policy* 1999, 19:3/4:22-47.
5. An embryologist Keith Moore writes "Human development begins at fertilization, the process during which a male gamete or sperm (spermatozoon) unites with a female gamete or oocyte (ovum) to form a single cell, the zygote." Moore, Keith L., Persaud, T.V.N., *Before We are Born: Essentials of Embryology and Birth Defects*, W. B. Saunders, Philadelphia, 1998, p. 36. Another embryologist, Waheed Rana writes "Embryonic life commences with fertilization which is the progression of events that begins when a spermatozoon makes contact with an oocyte or its investments, and ends with the intermingling of maternal and paternal chromosomes at metaphase of the first mitotic division of the zygote." Rana, M. Waheed, *Human Embryology Made Easy*, Overseas Publishers Association, Amsterdam, 1998, p. 25.
6. Totipotent cells are those capable of forming all types of cells, and even to develop into an embryo. Pluripotent cells are those with the capacity to form many, but not all, cell types.
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10. Fuchs, E., Segre, J.A., "Stem Cells: A New Lease on Life," *Cell* 2000, 100: 143-155.
11. John Paul II, *The Gospel of Life*, March 25, 1995, n. 53. The encyclical letter goes on further to explain that killing a human being is a particularly serious sin because that human life bears the image of God himself, the only Master of life. See n. 55.
12. Irving, Diane N. "NIH and Human Embryo Research Revisited: What is wrong With this Picture?" *Linacre Quarterly* 2000, 67: no. 2, 8-22.

13. McCormick, Richard, "Who or What is the 'Pre-Embryo'?", *Kennedy Institute of Ethics Journal* 1991, 1:1:3-15, and Ford, Norman, *When Did I Begin?*, Cambridge University Press, 1988, p. 298.

14. Human neuralation, University of New South Wales,

<http://anatomy.med.unsw.edu.au/cbl/embryo/Notes/ncrest.htm>.

15. The term pre-embryo introduced in the 1970 and 1980 has been dropped from embryology textbooks as inaccurate. The Human Embryo Research Commission and the NBAC have rejected it and describe the embryo as a living organism and a "developing form of human life". The idea that the embryo becomes a human being only after day 14 or implantation is a scientific myth. The 1995 Ramsey Colloquium stated that the embryo does not articulate into any other kind of animal. When it is objected that it does not look like a human being "it must be pointed out that this is precisely what a human being looks like-and what each one of us looked like- at five or fifteen days of development."

16. Serra, Angelo and Colombo, Roberto, "Identity and Status of the Human Embryo: the Contribution of Biology," *The Identity and Status of the Human Embryo, Proceedings of the Third Assembly of the Pontifical Academy for Life*, eds. Vial Correa, Juan de Dios and Sgreccia, Elio, Libreria Editrice Vaticana, 1997, p. 159.

17. *Ibid*, p. 151.

18. Braude, P., Bolton V., and Moore, S., "Human Gene Expression First Occurs Between the Four and Eight-Cell Stage of Preimplantation Development, *Nature* 1988, 332: 459-461.

19. See Serra, A., *o.c.*, p. 161 for extensive bibliography on findings in genetics.

20. "*The zygote is genetically unique* because half of its chromosomes come from the mother and half from the father. The zygote contains a new combination of chromosomes that is different from that in cells of either parents. *This mechanism forms the basis of biparental inheritance and variation of the human species.*" Moore, Keith L., Persaud, T.V.N., *Before We are Born: Essentials of Embryology and Birth Defects*, W. B. Saunders, Philadelphia, 1998, p.39.

21. Serra, A., *o.c.*, p. 153.

22. Moore, K. L., *o.c.*, p. 36.

23. Dianne Irving argues that it is on the basis of incorrect or distorted knowledge of embryology that contemporary authors have advanced the philosophical theory of delayed personhood. See Irving, Dianne, "The Woman and the Physician Facing

Abortion: The Role of Correct Science in the Formation of Conscience and the Moral Decision Making Process," paper delivered at the Scientific Conference *The Guadalupan Appeal*, Mexico City, Mexico, October 28, 1999, pp. 7, 8, 13.

24. Carrasco de Paula, an ethicist and theologian considers that in this matter, the Teaching of the Catholic Church has intentionally avoided the question of the moment of the infusion of the spiritual soul because it is not decisive for an ethical and moral judgment. Without declaring itself incompetent, the Catholic Church has suspended judgement on the subject for an indefinite period. See Carrasco de Paula, Ignacio, "The Respect due to the Human Embryo: A Historical and Doctrinal Perspective," *The Identity and Status of the Human Embryo, Proceedings of the Third Assembly of the Pontifical Academy for Life*, eds. Vial Correa, Juan de Dios and Sgreccia, Elio, Libreria Editrice Vaticana, 1997, p. 69.

25. Clifford Grobstein, a basic scientist, describes a number of changes in the human embryo between the phases he calls pre-implantation and implantation, all of which are functions of the human person, yet he mistakenly concludes that "Conception (fertilization) is the beginning of a new generation in the genetic sense and not the beginning of human life in any other yet demonstrated scientific sense." Grobstein, Clifford, "The Early Development of Human Embryos," *Journal of Medicine and Philosophy* 1985,236.

26. Serra A., *o.c.*, p. 150.

27. *Ibid*, p. 153. Serra calls this first stage of fertilization *syngamy* while other authors today employ this term to refer to the fusion of the genetic material at the last stage.

28. Moore gives the following definition of the zygote: "This cell, formed by the union of an oocyte and a sperm, is the beginning of a new human being (i.e., an embryo). The expression *fertilized ovum* refers to a secondary oocyte (ovum) that is impregnated by a sperm; when fertilization is complete, the oocyte becomes a zygote." Moore, K. L., *o.c.*, p. 2.

29. *Ibid*, p. 151, 155.

30. Aristotle, *Politics*, Bk. VIII, Ch. 16, Penguin Classics, Baltimore, 1964.

31. Carrasco de Paula, Ignacio, "The Respect due to the Human Embryo: A Historical and Doctrinal Perspective," *The Identity and Status of the Human Embryo*, Libreria editrice Vaticana, 1999, p. 59.

32. Peter Singer, an Australian philosopher, writes "If it is claimed that destroying an embryo does it harm because of the loss of its potential, why should we not say the same about the egg and sperm? The potential for new human life is there in both cases." Singer, Peter, *Rethinking Life and Death*, St. Martin's Press, New York,

1994, pp. 98-99. By equating the potential of individual gametes with that of a zygote he ignores the aforementioned biological data that establishes a significant difference. The zygote functions as a new unique organism whereas each gamete only possess the genetic information of one parent and has a limited cellular functions; to begin, a gamete is not a totipotent cell.

33. Gerdhart, J., "The Primacy of Cell Interaction in Development," *Trends in Genetics* 1989, 5:232-237.

34. See Serra A., *o.c.*, pp. 156-157.

35. *Ibid*, p. 157.

36. *Ibid*, pp. 163-165.

37. *Universal Declaration of Human Rights*, General Assembly of the United Nations, Dec., 10, 1948, Preamble, [www.un.org/Overview/rights.html](http://www.un.org/Overview/rights.html).

38. World Medical Association Declaration of Helsinki, 1962, revised in Tokyo, 1975, Italy, 1983, Hong Kong, 1989, I, 4, [www.faseb.org/arvo/helsinki.htm](http://www.faseb.org/arvo/helsinki.htm).

39. The Declaration of Helsinki concludes with the same assertion: "In research on man, the interest of science and society should never take precedence over consideration related to the well-being of the subject", *Ibid*, III, 4.

40. Congressional testimony of Senator Sam Brownback, April 26, 2000.

41. *Ibid*.

42. Haas, John M, "Human Dignity and Health Care," *Ethics and Medics* 1997, 22:2.

43. Joy, Bill, "Why the Future Does't Need Us," *Wired Magazine*, April 2000.

44. See Caplan, Arthur, "Setting Moral Rules for Reproduction," *Kent Law*, August 2000.

45. *Ibid*.

46. See Sutton, Angela, "Italy Says No to Embryo Research, Embryo Adoption and Embryo Freezing," *Catholic Medical Quarterly*, August 1999, p. 16. Bill N. 5655 would ban the production of embryos for research purposes, the cloning of human embryos and creation of chimeras or hybrids with gametes of other species.

47. Discussing the nutrition of a patient in a persistent vegetative state, Peter Singer argues that "technological advances in medicine have made it impossible to retain

the principle of sanctity of life". In fact his reason for defending the discontinuation of tube feeding to patients in persistent vegetative states is because they are an economic burden and, according to him, report no benefit to society. Singer, Peter, *Rethinking Life and Death*, St. Martin's Press, New York, 1994, p. 75.

48. Carrasco de Paula, Ignacio, *o.c.*, 48-59.

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50. Tertullian, *De Anima* 25, 4.

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