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Stem Cells and the Culture Wars

by

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The stem cell debate cannot be reduced merely to a disagreement as to the efficacy of embryonic stem cells versus adult stem cells. The debate is really a recapitulation of the fundamental conflict about the dignity and indeed the sanctity of human life from conception to natural death. In one view, life at all stages of its development has intrinsic value. In this transcendental view of human life, life at all stages has an intrinsic and unquantifiable value. This value transcends the alleged value of research. Human life in its most primitive beginnings, if it is previable or if it is deformed, dying of a fatal disease or however compromised has an ontological being which is still intact. Another point of view relevant to the stem cell debate would evaluate individual life as having only extrinsic value. Each human life is not an end in itself but may be a means to another end that is the good of society. This extrinsic value is conferred from the outside and some life in existence is said to lack it. Experiments can be carried out on one human life to benefit others. A small injustice done to an early or previable human life may result in large benefits for mankind.

Also looming large in the stem cell debate is the recurrent and mostly specious debate as to when life begins. There is virtually unanimous accord in the scientific community as to the reality that life begins with the union of the sperm and ovum in the process of fertilization. Surely there can no longer be any debate as to when life begins when we can make life begin in the process of in vitro fertilization carried out in the laboratory under man-made controlled conditions. The zygote created in this in vitro fertilization procedure is independent. It is not part of the petri dish in which the IVF occurs nor will it be part of the female uterus in which it will subsequently be implanted.

In 1998, scientists succeeded in isolating and growing human stem cells in the laboratory. These stem cells have the potential to develop into any of the different cell types of the body. After fertilization the zygote that comes into being divides into two cells which are totipotent. That is, by definition, they must be capable of producing all the tissues of the body. Either one of these cells implanted in the body of a woman is capable of developing into an entire human being. In fact, identical twins are formed when two totipotent cells separate and develop into two separate and identical human beings. In general scientists do not have access to this process but rather a subsequent stage that occurs after approximately four days in which these totipotent cells undergo the next stage of development that is characterized by specialization and the formation of a hollow sphere of cells called a blastocyst. The blastocyst is made up of an outer layer of cells known as the outer cell mass, whose potential is to go on and form the placenta and other supporting tissues needed for the nourishment and the support of the new embryonic human being in the uterus. The inner cell mass of the blastocyst is made up of pluripotent stem cells that will undergo the process of differentiation into the various cells and tissues of the new human being. These cells are pluripotent in that they are capable individually of developing into cells that have a particular function, for example, blood stem cells, liver cells, etc. These cells are pluripotent in their ability to give rise to various cell types but they are not totipotent in that they will not, if implanted in the womb of a woman, give rise to a complete human being.

While stem cells are thus important in early human development, they are also found in children and adults. These "adult" stem cells have been isolated from a variety of places in the body including bone marrow, blood, brain, spinal cord, dental pulp, liver, pancreas, etc. Another rich source of stem cells is umbilical cord blood and placental tissue.

The adult stem cells within these various organs will remain inactive until such time as they are needed to replace damaged or dying cells. Bone marrow stem cells divide to produce more stem cells, known as precursor cells, that will replace all of the different cells that make up the blood and immune system.

President Bush, early in his first term, was called upon to make a decision regarding existing stem cell "lines." A stem cell line is a colony of similar cells that were originally cultured from a stem cell. Under laboratory conditions these stem cells can continue to replicate for a prolonged period so that scientists can access these lines for cells to be used for research or transplantation. The position taken by President Bush on stem cell research, while imperfect, was an acceptable political resolution of a highly charged issue. This decision deserves praise with reservations. His position upholds the sanctity of human life from the time of fertilization. It acknowledges that adult and umbilical stem cell research

has outperformed fetal stem cell research both clinically and in the laboratory. It does this by generously funding adult stem cell research. The decision withholds any federal support from the production of any new stem cell lines from embryonic sources but it does not require the destruction of existing stem cell lines. The numbers of these stem cell lines have been variously estimated and most are apparently under the control of academic or commercial enterprises and therefore restricted in their availability to the general public. Although these lines are fruits of a poisonous tree, continued experimentation on existing cell lines has the potential for expanding the market for embryonic stem cells. This increased demand could lead thereby to the killing of human embryos to harvest embryonic stem cells or to resort to other unethical sources, such as cloning. We mourn the deaths of those embryos that were destroyed to produce these cell lines; we do not necessarily owe a loyalty to those embryos that were killed to establish the cell lines. An appropriate position for the Christian community is to support stem cell research as long as stem cells are harvested from ethical sources such as adult stem cells or umbilical cord blood. We condemn as immoral, of course, all attempts to achieve new embryonic stem cell lines and would encourage the destruction of any existing fetal stem cell lines. These latter cell lines, though derived from human life through its destruction, do not constitute human life in and of themselves. The best way to mourn and honor the murdered embryos would be to ask for an end to such unethical experiments in the future, in the spirit of the Declarations of Helsinki and Nuremberg.

Science and Religion

There is no conflict, of course, between science and religion. Most scientists are believers. Religion is not a form of superstition but rather a value system. Believers in one form or another of religious value systems are drawn from all walks of life – scientists and non-scientists alike. Nevertheless, the old canard of Neo-Ludditism is raised anew in the stem cell debate. The standard whipping boy class of the “religious right” is vilified as obstructionists to the progress of science or, worse yet, alleged to be attempting to use their religious “superstitions” to compromise the best interests of those afflicted with serious illnesses amenable only to embryonic stem cell cures. First of all it should be pointed out that President Bush’s decree did not make embryonic stem cell research illegal. Those in industry and in academic settings are still free to conduct embryonic stem cell research albeit without access to federal funding. It would seem that embryonic stem cell research has been mostly inhibited by the inability to control the phenomena of rejection and tumor production in embryonic stem cell experiments. What, in fact, is the state

of stem cell research within the parameters of using only adult stem sources and prescinding from the use of frozen embryos or cloning?

The following is a review of U.S. data currently available:

Adult Stem Cells:

This is a partial list of diseases treated successfully with adult stem cells from humans: Parkinson's disease; blindness; several types of solid tumors, including neuroblastoma; several types of leukemia; non-Hodgkin's lymphoma; relief of symptoms from lupus, multiple sclerosis, and rheumatoid arthritis. Perhaps most dramatic of all is the cure of combined immunodeficiency disease in childhood. Data from foreign sources have alleged on the basis of preliminary reports the relief or reduction of paralysis in patients reported from Portugal and Korea.

Embryonic Stem Cells:

Astonishingly, there have been no reports of the successful treatment or cure of any human patient. In addition, there is currently no animal model of any successful treatment with embryonic stem cells. The Juvenile Diabetes Research Foundation engages in lobbying efforts in Washington in which they claim that embryonic stem cell research is the "most promising" hope for the cure of juvenile diabetes. Nevertheless, the Foundation spent only 4% of their research budget on embryonic stem cell research and five times as much , 20% of their research budget, on adult stem cell research.

The fact is that we have a multibillion-dollar biotechnology industry spending virtually none of their own research dollars on this research while at the same time clamoring for the federal government to pick up the tab for it. The politicization of the issue is reflected in the maudlin appeal of Ron Reagan at the Democratic Convention for funds for the Alzheimer's disease that had caused the recent death of his father. Whatever other promise stem cell research might have, virtually no one believes the plaque formation in Alzheimer's disease would be amenable to cell replacement therapy. The political low point was reached when vice presidential candidate Edwards proclaimed that if he and Senator Kerry were elected, "Christopher Reeve would walk again." Similar messianic promises were made for other impaired movie stars.

Why the Promotion of Embryonic Stem Cell Research?

Since adult stem cells have apparently outperformed embryonic stem cells both clinically and in the laboratory, how do we account for virtually unanimous enthusiasm of the scientific community for embryonic over adult stem cell funding? Some of it relates to the innate scientific impulse

to pursue a promising new avenue based on the language of compassion. Promotion of ESCR usually consists in their "promise" in solving a long litany of dread, currently incurable maladies. The media have bought into the act of faith in embryonic stem cells as a panacea for all future health problems.

Beyond propaganda, however, are some more materialistic motivations. Researchers who prepare embryonic cell lines can obtain licenses to these cells and, in theory, reap great profits down the road when therapeutic applications are perfected. There is, in addition, a fascination on the part of research scientists that stem cell research is a kind of primordial entrée into the Tree of Life itself. The desire to master the hidden power of this new wonder can incite a fascination with a potential for power that tempts them to overstep basic moral boundaries. Most importantly there has emerged a connection between embryonic stem cell advocacy and pro-abortion ideology. Laws to protect human embryos from research would create immediate ramifications for the entire pro-choice world and threaten the abortion industry. With abortion a sacred cow of culture and politics, giving legal rights to embryos would make for an uncomfortable dissonance within pro-abortion premises. Pro-choice orthodoxy really opposes any notion that embryonic life should not be unreservedly at the disposal of the pregnant woman and the society at large. Anything which tends to undermine the dignity and the sanctity of life at its beginning would reinforce the notion that embryonic and fetal life do not have intrinsic value but rather should be disposable at the biological mother's choice.

Cloning

In February, 1997, the journal *Nature* published the work of Wilmut and colleagues leading to the birth of Dolly, a sheep who was allegedly the first cloned mammal. What was done was the removal of the nucleus from an egg, or oocyte, and replacing it with the nucleus of a mature somatic cell. There were 277 attempted oocyte-donor nucleus fusions, of which 29 started to develop and only one reached birth, the lamb called Dolly, which was a clone or the precise genetic copy of another mature sheep from which DNA of the somatic nucleus was derived. The success of this Scottish group where others had failed was apparently related to depriving the cells of nutrition to put them into a resting phase and then stimulating them with a small electrical current.

In contrast to other forms of artificial reproduction, cloning is achieved without the contribution of two gametes. The fertilization of the ovum by the sperm is replaced by the fusion of a nucleus taken from a

somatic cell with an oocyte from which the nucleus is removed. This is a form of asexual reproduction in which the genetic inheritance of the new individual is a replication of the genetic identity of the somatic nucleus donor instead of a blend of the DNA of the sperm and ovum.

Human cloning is unethical for at least two reasons. First, it is a form of human experimentation which would involve the creation and destruction of many embryonic human beings. It is likely that less than the 1:277 in the Scottish experiments would survive in the more complicated human cloning experiments. Secondly, it would result in total control over the genetic destiny of a developing child and would shift the foundation of parenthood from a duty to care for the child to a notion of property and ownership.

Some scientists claim that cloning research may yield important medical cures or therapies. Even if true, this does not justify the destruction of embryonic human beings or the radical shift in the nature of parenthood.

It is important to remember that embryos produced by so-called "non-reproductive cloning" are produced to serve as subjects for experimentation or as sources for the harvest of stem cells. This is, in other words, a human experiment in which the research subjects are brought into being as a result of the experiment and for the purpose of killing them according to the research protocol.

Twenty-nine countries have passed laws outlawing human cloning. Great Britain has passed a law allowing for human cloning as long as the cloned embryo is not implanted. In the U.S. Congress there are two kinds of bills: one to ban cloning altogether (Bond-Frist) and the second to allow cloning but to ban implantation. The total ban on cloning is the type of bill to be preferred and the most critical issue in achieving it is to overcome the claim that non-reproductive cloning is "essential to human progress" in that it would provide a source of human stem cells.

The great stem cell debate in its intensity is best understood as the latest frontier in the confrontation over the sanctity of human life first begun in 1973 with the passage of *Roe v. Wade*. The most vulnerable pawns in the debate are the hundreds of thousands of cryo-preserved "surplus" embryos left unimplanted after IVF procedures. A recent referendum passed in California would create a foundation apparently empowered to avail itself of this potential source of stem cells. A similar initiative has been undertaken in Illinois. The political struggle to preserve the integrity of embryonic stem cells is only the latest encounter in the Culture Wars on the dignity and meaning of life.