The Viability of Our Humanity: Will the Supreme Court's Abortion Jurisprudence Survive the Challenge of Embryonic Stem Cell Research?

Marta Brodsky
NOTE

THE VIABILITY OF OUR HUMANITY: WILL THE SUPREME COURT'S ABORTION JURISPRUDENCE SURVIVE THE CHALLENGE OF EMBRYONIC STEM CELL RESEARCH?

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“Everyone who is seriously involved in the pursuit of science becomes convinced that a spirit is manifest in the laws of the Universe—a spirit vastly superior to that of man.”

—Albert Einstein

INTRODUCTION

On May 27, 1995, forty-two year old Christopher Reeve was catapulted from his horse during an equestrian competition, cracking his first two vertebrae and damaging the delicate nerves that travel through the spine—the central nervous system. Having miraculously survived this accident, Reeve was, nevertheless, rendered completely and permanently paralyzed. Given the highly specialized structure of cells that compose the central nervous system, once damaged, they do not regenerate, and there is currently no treatment, with either drugs or surgery, that can replicate their critical role as carriers of neural messages. As a result, Reeve, along with a quarter of

1 J.D. Candidate, June 2003, St. John's University School of Law; B.A., May 1988, San Francisco State University.
3 See Lois Romano, Riding Accident Paralyzes Actor Christopher Reeve, WASH. POST, June 1, 1995, at A1.
4 Id.
a million other Americans who have sustained spinal injuries, must learn to cope with paralysis.\(^5\)

On February 2, 2000, Michael J. Fox announced his decision to quit acting in order to devote his energy to finding a cure for Parkinson's, a disease that has been progressively destroying his central nervous system.\(^6\) Parkinson's affects over one million people in the United States, with a growing number of victims under the age of fifty.\(^7\) While the disease itself is not known to be fatal, approximately one-third of those affected will develop collateral illnesses such as senile dementia, blood poisoning, and stroke, which may be fatal.\(^8\) The disease acts upon the brain, destroying cells (or neurones) that produce the crucial chemical dopamine, and in the process, decimates the area that controls movement.\(^9\) Parkinson's is currently incurable, and the only treatment is dopamine-replacement drugs.\(^10\)

On June 26, 2001, Mary Tyler Moore,\(^11\) who has suffered from juvenile diabetes for more than thirty years, described to the Senate Committee on Governmental Affairs the hourly
vigilance she has had to maintain in order to keep herself alive.\footnote{See Diabetes: Is Sufficient Funding Being Allocated to Fight this Disease?: Hearing Before the Permanent Subcomm. on Investigations of the S. Comm. on Governmental Affairs, 107th Cong. (2001) [hereinafter Investigations] (statement of Mary Tyler Moore, International Chairman, Juvenile Diabetes Research Foundation International), available at \url{http://www.senate.gov/-gov_affairs/062601_moore.htm}; see also Benefits of Stem Cell Research: Hearing Before the Subcomm. on Labor, Health and Human Services, Education of the S. Comm. on Appropriations, 106th Cong. (2000) [hereinafter Labor] (statement of Mary Tyler Moore, International Chairman, Juvenile Diabetes Research Foundation International), available at \url{http://64.226.215.175/advocacy/testimony/index.cfm?testimony_id=130}.}\footnote{See Investigations, supra note 12; see also Labor, supra note 12. For powerful stories of young children suffering juvenile diabetes, and the seemingly daily terror they and their parents face from the potentially fatal symptoms, see Juvenile Diabetes Research Found. Intl, \textit{Life with Diabetes}, at \url{http://www.jdrf.org/living_w_diabetes/family_diagnosis.php} (Nov. 21, 2001).} Moore is not alone. Millions of others so afflicted in childhood live out their lives in constant fear that one slip could result in stroke, coma, or death.\footnote{See \textit{NAT'L DIABETES INFO. CLEARINGHOUSE, DIABETES OVERVIEW} (NIH Publication No. 02-3873), \url{http://www.niddk.nih.gov/health/diabetes/pubs/dmover/dmover.htm} (May 2002).} \footnote{Id.} Juvenile diabetes is an auto-immune disease in which the body's own immune system attacks and destroys the insulin-producing cells in the pancreas.\footnote{Id.} After eating or drinking, glucose (or sugar) levels rise in the bloodstream.\footnote{Id.} In a healthy metabolic process, the pancreas produces insulin to metabolize the glucose.\footnote{Id.} If the pancreas is unable to produce insulin, however, the excessive levels of sugar in the bloodstream cause hypoglycemia.\footnote{Id. Hypoglycemia is an immediate reaction involving such symptoms as tremors, dizziness, verbal slurring, and blurred vision. Recurring bouts of hypoglycemia often lead to blindness, heart disease, stroke, kidney failure, nerve damage, or death. Juvenile diabetes is currently incurable, and the only treatment is insulin injections.\footnote{Id.} On November 5, 1994, former President Ronald Reagan informed the American people that he had been diagnosed with
Alzheimer's disease.\textsuperscript{20} Seven years later, President Reagan, once the leader of the free world, was not always able to recognize his wife.\textsuperscript{21} Alzheimer's is a progressive disease that begins with forgetfulness and eventually ends in dementia, the total destruction of memory, language, and the ability to function.\textsuperscript{22} Alzheimer's effects are well known, but its cause remains a mystery.\textsuperscript{23} The disease destroys nerve cells and the chemicals that carry complex messages across those cells in the areas of the brain that control memory and other mental abilities.\textsuperscript{24} Approximately four million people in the United States suffer from Alzheimer's.\textsuperscript{25} It is currently incurable, and although there are drugs that temporarily seem to alleviate cognitive impairment early on, there is no way to stop the disease's eventual annihilating progression.\textsuperscript{26}

\textsuperscript{20} See Ronald Reagan, Announcement of Alzheimer's Disease (Nov. 5, 1994), at http://reagan.com/Ronald/speeches/rrspeech05.shtml. In closing this poignant address, President Reagan wrote:

Un fortunately, as Alzheimer's disease progresses, the family often bears a heavy burden. I only wish there was some way I could spare Nancy from this painful experience. When the time comes, I am confident that with your help she will face it with faith and courage.

In closing, let me thank you, the American people, for giving me the great honor of allowing me to serve as your president. When the Lord calls me home, whenever that day may be, I will leave with the greatest love for this country of ours and eternal optimism for its future.

I now begin the journey that will lead me into the sunset of my life. I know that for America there will always be a bright dawn ahead.

\textit{Id.}

\textsuperscript{21} See CBS News (CBS television broadcast, Feb. 6, 2001); see also President Reagan at 90, N.Y. TIMES, Feb. 7, 2001, at A18:

He is living a version of self in which the idea of self has to be reinvented moment by moment, day by day. Every hour there is a new part to learn even if it is always the same part. You do not have to be a Reagonite to realize that this is more than a personal loss, to himself and to his wife, Nancy, and their friends. It is a national loss.

\textsuperscript{22} See NAT'L INST. OF NEUROLOGICAL DISORDERS AND STROKE, NINDS ALZHEIMER'S DISEASE INFORMATION PAGE, at http://www.ninds.nih.gov/health_and_medical/disorders/alzheimersdisease_doc.htm (reviewed Sept. 6, 2001).

\textsuperscript{23} \textit{Id.}

\textsuperscript{24} See ALZHEIMER'S DISEASE EDUC. AND REFERRAL CTR., ALZHEIMER'S DISEASE FACT SHEET (NIH Publication No. 01-3431), http://www.alzheimers.org/pubs/adfact.html (Sept. 2001). In 1906, Dr. Alois Alzheimer, the German doctor after whom the disease was named, discovered changes in the brain tissue of a woman who had died of an unusual mental illness. What he noticed were abnormal clumps (called amyloid plaques) and tangled bundles of fibers (known as neurofibrillary tangles), which, today are considered hallmarks of the disease. \textit{Id.}

\textsuperscript{25} \textit{Id.}

\textsuperscript{26} See NAT'L INST. OF NEUROLOGICAL DISORDERS AND STROKE, supra note 22.
These stories have far more in common than celebrity; they represent the staggering challenges that tens of millions of Americans face when living in the permanent shadow of neurological diseases and injuries that threaten their survival.\footnote{According to the Centers for Disease Control and Prevention, more than 190,000 Americans are paralyzed in some form from spinal injuries and every year approximately 11,000 more are similarly injured. See CTRS. FOR DISEASE CONTROL AND PREVENTION, WHAT YOU SHOULD KNOW ABOUT SPINAL CORD INJURIES, at http://www.cdc.gov/safeusa/home/sci.htm (last updated June 24, 2002).} Moreover, Parkinson's, diabetes, and Alzheimer's are only a few of the seemingly infinite number of diseases that debilitate our nation's citizens.\footnote{The Centers for Disease Control and Prevention also reports that seventeen million people (6.2\% of the national population) have diabetes, and an additional one million new cases are diagnosed in people over the age of twenty each year. Of the total number of people with diabetes, approximately 151,000 are less than twenty years old. See CTRS. FOR DISEASE CONTROL AND PREVENTION, NATIONAL DIABETES FACT SHEET, at http://www.cdc.gov/diabetes/pubs/estimates.htm# incidence (last reviewed Mar. 27, 2002).} Most importantly, however, what unifies

\begin{itemize}
\item Parkinson's disease affects as many as four million Americans. Most people diagnosed with AD are older than 65. However, it is possible for the disease to occur in people in their 40's and 50's.\footnote{The National Institute of Health reports that at least 500,000 Americans suffer from Parkinson's disease, and about 50,000 new cases are reported annually. See NAT'L INST. OF NEUROLOGICAL DISORDERS AND STROKE, PARKINSON'S DISEASE BACKGROUNDER, at http://www.ninds.nih.gov/health-and-medical/pubs/parkinson's_disease_backgrounder.htm (reviewed July 1, 2001).} "Alzheimer's disease affects as many as four million Americans. Most people diagnosed with AD are older than 65. However, it is possible for the disease to occur in people in their 40's and 50's." ADMIN. ON AGING, ALZHEIMER'S DISEASE, at http://www.aoa.dhhs.gov/factsheets/alz.html (last reviewed Feb. 23, 2001).
\item Multiple Sclerosis is another neurological disease that has recently received much national attention, given the announcements of their affliction by such celebrities as Montel Williams and David Lander (a.k.a. "Sguiggly" of the television sitcom, Laverne & Shirley). MS is an incurable progressive disease that strips the protective myelin sheath from nerve cells. See Bruce D. Trapp et al., Axonal Transection in the Lesions of Multiple Sclerosis, NEW ENG. J. MED., Jan. 1998, at 278; see also Chris Pursell, Montel, Paramount to Fight Through MS, VARIETY, Aug./Sept. 1999, at 157. In his book, David Lander describes the difficulties associated with MS: If you watch a blind person move around a room he knows, he does so effortlessly, following walls and furniture with fingers, moving through difficult areas using memory and the strategic placement of a hand. Negotiating surroundings in the world of MS is very similar: When I'm experiencing the usual MS symptoms, it's as if my body cannot see. If my body does not physically know an area, I cannot always trust the ability we usually take for granted of getting through a room without losing my balance, tripping, or falling flat on my face.\footnote{In addition to these neurological diseases, there are the big killers: heart disease and cancer. Chances are that those of us who have escaped these frailties, nevertheless, know someone less fortunate since heart disease and cancer are the first and second causes respectively of death in America. See NAT'L CTR. FOR}
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those afflicted is the absence of a cure for their disease. There are, of course, drugs and physical therapies to help sufferers cope with symptoms and consequences, but these treatments do not restore the body to its pre-diseased or pre-injured condition. The prospect of developing genuine cures, however, is held out by further research into embryonic stem cells and of transplantation science.

According to scientists, the human embryonic stem cell is a powerful key that has the potential to unlock an entire universe of "regenerative medicine." In this new world, diseased and damaged adult tissue is essentially reconstructed with the introduction of embryonic cells that have been cultivated to replace particular specialized cells. Given their nascent state, these young cells possess the potential ability to develop into any type of cell, ultimately growing, for example, into pancreatic cells.

29 See supra notes 4, 10, 19 and 26 and accompanying text.
30 See supra notes 4, 10, 19 and 26 and accompanying text.
31 The major breakthrough in embryonic stem cell research came in 1998 when an American researcher stunned the scientific community with the first success of "growing" the cells. Dr. James A. Thomson, at the University of Wisconsin, Madison, in collaboration with scientists at the Rambam Medical Center, in Haifa, Israel, extracted undifferentiated ("pluripotent") stem cells from frozen embryos. Donated by couples using the services of infertility clinics, the embryos had been considered in excess of clinical needs for in vitro fertilization. See David L. Wheeler, Human Embryonic Cells Grown in Laboratory for First Time, THE CHRONICLE OF HIGHER EDUC., Nov. 13, 1998, at A16; see also James Thomson et al., Embryonic Stem Cell Lines Derived from Human Blastocysts, 282 SCIENCE 1145 (1998).

In describing his research, Dr. Thomson stated that "[e]mbryonic stem (ES) cells capture the imagination because they are immortal and... have an almost unlimited development potential. ... [Because of this,] human ES cells promise an essentially unlimited supply of specific cell types for transplantation therapies." See James A. Thomson, Individual Expertise Profile, at http://myprofile.cos.com/Thomsonj00 (last updated March 12, 2001).

32 The term "regenerative medicine" incorporates the vast advances in cell biology, cloning, and transplantation medicine. It was coined by William A. Haseltine, one of the leading pioneers in transplantation research, while serving as Chairman and CEO of the Human Genome Project. See 2001 Regenerative Medicine Conference to Reveal 'A Blueprint for the Future of Medicine,' Says William Haseltine, BUS. WIRE, Sept. 28, 2001. For detailed information about the Human Genome Project, see NAT'L HUMAN GENOME RESEARCH INST., THE HUMAN GENOME PROJECT, at http://www.genome.gov (last visited July 13, 2002) [hereinafter GENOME PROJECT].

for diabetes sufferers or into new brain cells for Parkinson's patients.34

Embryonic stem cell research is rapidly changing our perception of disease.35 Indeed, researchers worldwide are turning scientific theory into potentially curative reality.36

Embryonic stem cell research, however, is not all about life. The very reason that these cells possess such miraculous potential to develop healthy tissue in a diseased body is that they themselves have yet to develop on their own.37 They are literally the stuff of which each of us is made. They are the basic genetic material that composes the human embryo and, if uninterrupted, these stem cells would ultimately grow into human children.38 Consequently, extracting any one of these stem cells destroys the embryo.39 This paradox raises profound questions about the nature of conception and the status of an

34 See id. ("Embryonic stem cells possess the powerful ability to turn into any kind of specialized cells. That means they could, at least theoretically, be cultivated to replace any of the 220 varieties of human tissue—pancreatic cells for diabetes sufferers, for instance, or brain cells for Parkinson's patients.").

35 See S. Comm. on Health, Educ., Labor, and Pensions Hearing on Stem Cell Research, 107th Cong. (2001) [hereinafter Stem Cell Hearing] (statement of Fr. Kevin Fitzgerald, Georgetown University) ("Advances in medical research are happening at such a rapid rate that it seems new breakthroughs are announced every week in the media."). available at http://thomas.loc.gov/home/sencom.html.

36 See Wheeler, supra note 31. Since Dr. Thomson's breakthrough findings in 1998 at the University of Wisconsin, research with embryonic stem cells has yielded an explosion of results. In May 2000, it was reported that researchers working with laboratory animals at the Washington University School of Medicine in St. Louis used embryonic stem cells to restore myelin—the tissue that covers and insulates nerve fibers. See Embryonic Stem Cells Restore Nerve Tissue, THE TIMES UNION, May 23, 2000, at A4. In August 2001, researchers at the Technion-Israel Institute of Technology reported stimulating human embryonic stem cells into creating the insulin producing cells that are depleted by juvenile diabetes. See Stem Cells Produce Insulin Cells, UPI, Aug. 1, 2001, LEXIS, Nexis Library, UPI File. In September 2001, Dr. Thomson once again made news by turning the embryonic stem cells he had first isolated in 1998 into human blood cells. See CBS Morning News (CBS television broadcast, Sept. 4, 2001), LEXIS, Nexis Library, News Group.

37 See Sylvia Pagan Westphal, Beating the Ban, NEW SCIENTIST, Oct. 6, 2001, at 14 (stating that "[t]he most versatile and useful [stem cells]are embryonic stem cells (ESCs), which you get from the ball of cells that forms a few days after fertilisation. The trouble is that to get ESCs you have to destroy an embryo that could become a child.").

38 Id.

embryo as human life. These questions have already engaged our nation, anguished our political leaders, and will inevitably challenge our nation's courts.

Part One of this Note will describe the regenerative science of embryonic stem cell research. This part will define the stem cell and explain the process of extracting it from embryos. Part Two of this Note will briefly summarize the relevant legislative action that affects this research. This includes President Bush's recent federal funding restriction, although that restriction is irrelevant to the continuation of research by private funding, and thus does not resolve the controversy over whether to destroy the embryos. Part Three of this Note will explore the general ethical controversy. Due to the fact that the controversy hinges on the familiar question of when life begins, much of the debate has paralleled arguments used in the vitriolic battle over abortion. Consequently, as the pressures of progress mount, this

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41 See, e.g., Stephen J. Forman, Stem Cell Research—The View from the Patient's Bedside, THE BUFFALO NEWS, July 29, 2001, at H1 (“As a practicing hematologist/oncologist, I look forward to the day when we will be able to turn stem cells into specific tissues to replace those lost or damaged by cancer. The potential of embryonic stem cell research for cancer and almost every debilitating disease should not be underestimated.”); Khalid Moss, Stem Cell Research Has Become Religious Debate, DAYTON DAILY NEWS, July 28, 2001 (stating that “[s]imply put, the human embryo stem cell debate is a pro-life issue for the brave new world”).

42 On August 9, 2001, President George Bush declared that stem cells may only be taken from destroyed embryos, thereby postponing a decision about whether embryos consist of life or mere cellular tissue. See Amy Goldstein & Mike Allen, Bush Backs Partial Stem Cell Funding, THE WASH. POST, Aug. 10, 2001, at A1:

In recent weeks, Bush's aides have been eager to demonstrate his personal agonizing over whether to permit government subsidies of this type of research. The issue has elicited an outpouring of conflicting advice to Bush from researchers, ethicists, politicians, lobbying groups and the famous—including former first lady Nancy Reagan and the pope. Even the president's most senior advisers have been divided. The president is said to have spent a portion of every working day on the issue for the past two months.

Id.; see also Victoria Griffith, Debate on Stem Cell Use After Abortion Set to Grow, FIN. TIMES (London), July 27, 2001, at 10 (stating that “[t]he use of foetal [sic] stem cells opens an ethical can of worms”); Tommy Thompson, Door to Research Is Open, USA TODAY, Sept. 7, 2001, at 14A (stating that “President Bush opened the door to embryonic stem cell research in an ethical and morally sound manner”).

43 This will be a general description. The more intricate details of regenerative medicine are beyond the scope of this paper. For more sophisticated information, see GENOME PROJECT, supra note 32.
controversy is likely to appear before our nation’s highest court. The nature of this question calls for a re-evaluation of the landmark abortion cases, Roe v. Wade,44 and its descendant, Planned Parenthood v. Casey.45

Part Four of this Note will re-evaluate the fetal viability standard used in both Roe and Casey,46 and test it against the present controversy. Although both Roe and Casey focused specifically on abortion, the adoption of fetal viability as the basis upon which to balance the constitutional interests of a woman against those of the state possesses implications for the current stem cell debate that the Court could not have foreseen. Regenerative research with embryonic stem cells has the potential to move the point of fetal viability to the earliest possible moment—conception. As a result, this standard, which courts have been relying on for decades to decide abortion disputes, may lose its feasibility. Rather than a measuring device, viability may become only a threshold expression of embryonic interests. Ultimately, the Court will likely find it necessary to create a new model for our new world. The Conclusion will reconsider the power of embryonic stem cell research, its potential ability to impact the world, and its surprising challenge to our individual assumptions about life.

I. THE STEM CELL: MATERIAL FOR LIFE

The stem cell is, as its name suggests, a cell from which all future cells blossom.47 When a sperm fertilizes an egg, the result (a zygote) is a single cell, imbued suddenly with the potential to become a complete human being.48 Within hours, that one cell

[^46]: See infra notes 95–120 and accompanying text.
[^47]: STEDMAN'S MEDICAL DICTIONARY 305 (26th ed. 1995) ("[S]tem c[ell], (1) any precursor cell; (2) a c[ell] whose daughter c[ell] may differentiate into other c[ell] types.").
During reproduction, when egg and sperm cells, called gametes, unite in the process known as fertilization, they form what is called a zygote. Chromosomes from each gamete pair up and the zygote divides in a process called mitosis. The zygote becomes two cells, these become four cells, and so on. At some early stage this ball of cells, the blastocyst,
begins to divide generating more and more cells, each of which, independently, has the potential to develop into a human body.\textsuperscript{49} After approximately four days, and numerous subdivisions, these cells begin to specialize, forming what is known as a blastocyst.\textsuperscript{50} The blastocyst is, very generally, a sort of sphere, where some of the original cells form an outer enclosure, and the rest cluster together in the center.\textsuperscript{51} The external layer will eventually become the embryo’s placenta, and the cluster within will become the embryonic body.\textsuperscript{52} At the blastocyst stage, however, the stem cells still possess the capacity to grow into any type of tissue; consequently, they are known as “pluripotent” embryonic stem cells.\textsuperscript{53} This capacity is what makes stem cells potentially so beneficial.

Due to their extraordinary versatility, pluripotent embryonic stem cells, derived from young embryos, are the focus of regenerative research. In addition to embryos, there are two other sources of stem cells, albeit less versatile ones—human fetuses and adult blood—each with different characteristics derived from their states of maturity.\textsuperscript{54} Aborted fetal tissue is the source of embryonic germ cells.\textsuperscript{55} These cells are somewhat more specialized than stem cells derived from embryos, but they are still considered pluripotent, and thus are capable of giving rise to almost any other cell type.\textsuperscript{56} The blood of fully-grown adults has been the source of stem cells for many years but these cells, which have already specialized into blood cells, have obviously become very highly specialized. As such, they are considered merely “multipotent,” since their capacity to

\textsuperscript{49} At this stage, cells are known as “totipotent,” because of their total potential—the ability, that is, to commit itself to any specialization, for example, skin, blood, or bone. See NIOH, supra note 48.

\textsuperscript{50} Id.

\textsuperscript{51} Id.

\textsuperscript{52} Id.

\textsuperscript{53} Id.


\textsuperscript{55} See NIOH, supra note 48.

\textsuperscript{56} See id; see also STEDMAN'S MEDICAL DICTIONARY, supra note 47, at 559 (defining human embryos as “the developing organism from conception until approximately the end of the second month; developmental stages from this time to birth are commonly designated as fetal”).
differentiate into any other cell type is severely limited, and thus, significantly less useful for regenerative research.\textsuperscript{57}

Embryonic stem cells are extracted from the embryo before they begin to differentiate. Theoretically then, cells are transplanted into an adult's corresponding body part—the pancreas, for example, or the brain, or any part that has been ravaged by, or is responsible for, disease or injury.\textsuperscript{58} Although much research is still needed, much has already been conducted. The enormous curative potential depends on the premise that these cells, once transplanted, will then ignite a course of self-renewal and the person will, for all intents and purposes, be cured.\textsuperscript{59} The cost of this type of treatment, of course, is the life of the embryo.

To date, there have been three sources of embryonic and germ stem cells: (1) donated frozen embryos that were previously intended for in vitro fertilization,\textsuperscript{60} (2) the reproductive areas of donated aborted fetuses,\textsuperscript{61} and (3) the artificial process of somatic nuclear transfer, that is, the cloning of human stem cells.\textsuperscript{62}

\textsuperscript{57} See CHAPMAN, \textit{supra} note 54, at vii ("[M]any cells of medical interest cannot currently be obtained from adult-derived stem cells. It is also less feasible to develop large-scale cultures from adult stem cells.").

\textsuperscript{58} See NIOH, \textit{supra} note 48.

\textsuperscript{59} See id. ("The hope is to develop heart muscle cells from human pluripotent stem cells and transplant them into the failing heart muscle in order to augment the function of the failing heart."); see also, James A. Thomson & Jon S. Odorico, \textit{Human Embryonic Stem Cell and Embryonic Germ Cell Lines}, 18 \textit{TRENDS IN BIOTECHNOLOGY}, 53, 53 (2000) ("Undifferentiated human embryonic stem cells and embryonic germ cells can be cultured indefinitely and yet maintain the potential to form many or all of the differentiated cells in the body. Human ES and EG cells . . . promise new therapies based on the transplantation of ES and EG cell-derived tissues.").

\textsuperscript{60} See NIOH, \textit{supra} note 48 ("Dr. Thomson received embryos from IVF (In Vitro Fertilization) clinics—these embryos were in excess of the clinical need for infertility treatment.").

\textsuperscript{61} See id. ("Dr. Gearhart isolated pluripotent cells from fetal tissue obtained from terminated pregnancies. . . . Dr. Gearhart took cells from the region of the fetus that was destined to develop into the testes or the ovaries.").

\textsuperscript{62} See id. Somatic cell nuclear transfer (SCNT) involves fusing two cells, one in which the nucleus has been removed and another that remains integrated. After fusion, these cells begin to divide, replicating mitosis to become a blastocyst, the embryonic body from which scientists then extract the stem cells. See id.
II. THE EMBRYO: DEAD OR ALIVE

On August 9, 2001, President Bush addressed the nation and explained his decision to limit the derivation of stem cells from embryos, an issue he called, "one of the most profound of our time."63 Prior to this announcement, as fiery debates raged through Congress64 and across the nation65 over the costs and benefits of research using embryos, President Bush met and deliberated with everyone from personal advisors to the Pope.66

65 See, e.g., Betsy Hart, Facts left out of stem cell debate, SCRIPPS HOWARD NEWS SERVICE, July 26, 2001, LEXIS-NEXIS Academic Universe, News, Wire Service Reports (“Tragically, the profound ethical questions at stake are almost dismissed as proponents of such research doggedly pursue an ‘ends justifies the means’ strategy.”); Right to Life of Michigan Hails Life-Saving, Life-Respecting Research; Ethical Stem Cell Research to Lead the Way, U.S. NEWSWIRE, July 26, 2001, LEXIS-NEXIS Academic Universe, News, Wire Service Reports (“We have arrived at the threshold of the ‘Brave New World.’ If we are to remain a civilized society, it is crucial that we adhere to the most important standards regarding human life.”).
66 See Goldstein & Allen, supra note 42. On July 23, 2001, President Bush and Pope John Paul, II met and discussed the President’s upcoming decision regarding embryonic stem cell research. See Remarks by President Bush and His Holiness Pope John Paul II (July 23, 2001) (transcript available at http://www.whitehouse.gov/news/). The recorded public discourse between President Bush and the Pope underscores the Catholic Church’s well-known position concerning when life begins. As the Pope said:

A free and virtuous society, which America aspires to be, must reject practices that devalue and violate human life at any stage from conception until natural dead. In defending the right to life, in law and through a vibrant culture of life, America can show a world the path to a truly humane future in which man remains the master, not the product of his technology. Mr. President, as you carry out the tasks of the high office which the American people have entrusted to you, I assure you of a remembrance in my prayers.
Advised of the existence of 64 stem cells that had already been obtained from embryos, the President decided to allow federal funding for research using only those existing stem cells. The premise of this decision was that, theoretically, these stem cells could reproduce endlessly and thereby perpetuate an infinite supply of future stem cells from which the research could continue, without destruction of any future embryos. Some commentators heralded this decision as an “ethical and morally sound” compromise; others criticized it as “nonsense.” Nevertheless, the President’s decision limited only federal funding; it did not impinge on private financing, nor did it curtail, except by virtue of influence, the future destruction of embryos for their stem cells.

The Human Cloning Prohibition Act of 2001, on the other hand, proposes to criminalize the alternative method scientists have used to obtain embryonic stem cells, namely—somatic nuclear transfer, or cloning. On July 31, 2001, the House passed the bill by an overwhelming vote of 251 to 176. The bill would impose heavy criminal and civil penalties, including imprisonment of up to 10 years and fines exceeding one million dollars, for virtually any involvement with cloning or the shipping of cloned cells. Primarily, the bill would prohibit

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Id.

67 See Remarks by the President on Stem Cell Research, supra note 65.
68 See Sheryl Gay Stolberg, Trying to Get Past Numbers on Stem Cells, N.Y. TIMES, Sept. 7, 2001, at A15 (stating that “the term ‘embryonic stem cell line’ has a specific meaning: a self-perpetuating colony of cells, grown over a period of months, that exhibit biological characteristics showing they can become any tissue or organ”).
69 See Thompson, supra note 42, at 14A.
73 H.R. 2505 §2(c) reads:
(1) Criminal Penalty—Any person or entity that violates this section shall be fined under this section or imprisoned not more than 10 years, or both.
(2) Civil Penalty—Any person or entity that violates any provision of this section shall be subject to, in the case of a violation that involves the derivation of a pecuniary gain, a civil penalty of not less than $1,000,000 and not more than an amount equal to the amount of the gross gain multiplied by 2, if that amount is greater than $1,000,000.
human cloning for reproductive purposes, that is, for the purpose of duplicating adult human beings, whether in order to create a super Olympic team, or, as Congress more likely fears, to create a unique inventory of our own spare parts. Indeed, reproductive cloning is a prospect that many would find morally reprehensible, if not frightening. Specifically, however, the bill also would expressly forbid the use of human cloning for therapeutic purposes, thereby banning the process of somatic nuclear transfer, which is used to produce embryonic stem cells.\(^7\)

Given the extraordinary curative promise of regenerative medicine, the support for embryonic stem cell research has generally been vast and vigorous. The opposition to this research has been equally vociferous, however, given the extraordinary ethical anguish stimulated by the requisite destruction of human embryos. Consider, for example, the statement of Senator Arlen Specter, a usually conservative politician backing “pro-life” policies, who nevertheless supports the use of embryonic stem cell research:

There is no doubt that the debate on human embryonic stem cells makes us question our priorities, compassion, morals, and ethics. And that is as it should be with any new scientific journey. We must choose a path that does not impede the progress of science; that gives us the best chance to help those who may benefit from stem cell research; and does so in a moral and ethical fashion. Now is the time for politics to end, so that the healing may begin. The American playwright, Howard Sackler, wrote “to intervene between our fellow creatures and their suffering or death, is our most authentic answer to the question of our humanity.” Let us answer in the affirmative once again.\(^7\)

In contrast to Senator Specter, the testimony of Friar Kevin Fitzgerald, a professor at Georgetown University, represents the empathic instincts of many people, regardless of their particular religious beliefs:

\(^7\) See H.R. 2505 §2(d), 107th Cong. (2001) (“Scientific Research—Nothing in this section restricts areas of scientific research not specifically prohibited by this section, including research in the use of nuclear transfer or other cloning techniques to produce molecules, DNA, cells other than human embryos, tissues, organs, plants, or animals other than humans.”) (emphasis added).

\(^7\) See Stem Cell Hearing, supra note 35 (statement of Sen. Arlen Specter).
Some argue that frozen “spare” embryos, left over from in vitro fertilization treatments and not likely ever to be used to produce a pregnancy, might justifiably be destroyed in order to get embryonic stem cells. However, using a fundamental principle of health care which states that first of all one should not unnecessarily harm another, one can counter that no human life is “spare.” Who among us has the right to decide that another human life is a “spare” life, especially when that human life does not have the chance to contest the decision?76

As Congress attempts to balance these interests through deliberations and debate, science hurtles on. One need not contemplate the dilemma for long before it becomes apparent that how, and if, we ultimately agree to conduct this experiment, it will reflect far more deeply on the humanity of our society than on the humanness of the embryo.77

III. THE QUESTION OF OUR HUMANITY

Fundamentally, the ethical dilemma attached to embryonic stem cell research hinges on the right to life.78 As the argument goes, if one believes that life begins at conception, then destruction of human embryos for any purpose—no matter how beneficial—is simply wrong. On the other hand, if one believes that life begins at some point after conception, then it is the refusal to utilize this cellular material for life-saving purposes that is morally questionable. In other words, the preservation of an embryo that will never develop into a full human being—indeed, that may be discarded entirely—is an empty sacrifice that not only devalues the embryo, but more importantly,

76 See id. (statement of Fr. Kevin Fitzgerald, Georgetown University).
77 “Man did not weave the web of life, he is merely a strand in it. Whatever he does to the web, he does to himself.” Statement attributed to Chief Seattle (c. 1786–1866) by Ted Perry, as discussed in Joyce E. Meredith & William C. Steele, The Truth of Chief Seattle, reprinted in 14 Pantheist Vision (1993), http://www.pantheist.net/society/chief_seattle_testimony.html.
78 See THE NAT'L BIOETHICS ADVISORY COMM'N, ETHICAL ISSUES IN HUMAN STEM CELL RESEARCH ii (1999) [hereinafter NBAC REPORT]. According to the NBAC REPORT:

For those who believe that the embryo has the moral status of a person from the moment of conception, research (or any other activity) that would destroy the embryo is considered wrong and should not take place. For those who believe otherwise, arriving at an ethically acceptable policy in this arena involves a complex balancing of a number of important ethical concerns.

Id.
minimizes the enormous pain of those living with potentially treatable ailments.\textsuperscript{79}

Clearly, reasonable ethical people disagree. In response to an executive request, and with the expectation of considerable disagreement, the National Bioethics Advisory Commission (NBAC)\textsuperscript{80} undertook the task of publishing guidelines for the ethical use of stem cells in medical research.\textsuperscript{81} In a comprehensive report, issued in September 1999, the NBAC concluded that the moral status of an embryo was somewhere in between that of a live human being (with full status) and that of a mere clump of cells (with no status).\textsuperscript{82} "The embryo merits respect as a form of human life, but not the same level of respect accorded persons."\textsuperscript{83} As such, the NBAC recommended federal funding for embryonic stem cell research using embryos in excess of in vitro fertilization needs as well as aborted fetuses.\textsuperscript{84} It justified this recommendation on the utilitarian grounds that the cost of destroying a human embryo was outweighed by the potential of its stem cells "to produce health benefits for individuals who are suffering from serious and often fatal diseases."\textsuperscript{85}

For those who believe that life begins at conception—indeed, even for those who disagree that life begins at conception, but who are bothered by the NBAC's utilitarian justification—a statement of Pope John Paul II may seem apt.\textsuperscript{86} Just four years

\textsuperscript{79} As Christopher Reeve put it, "Is it more ethical for a woman to donate unused embryos that will never become human beings, or to let them be tossed away as so much garbage when they could help save thousands of lives?" Christopher Reeve, \textit{Use the Body's 'Repair Kit': We Must Pursue Research on Embryonic Stem Cells}, \textit{TIME}, May 1, 2000, at 60; see also Paegel, supra note 48, at 1220 ("One feels compelled to offer words of encouragement to Superman and countless others. The work will go on!").

\textsuperscript{80} The National Bioethics Advisory Commission was chartered in 1996 by President Clinton to study the ethical issues arising from biomedical research. See \textit{Human Cloning Hearing}, supra note 64 (statement of Alexander Morgan Capron, Commissioner, National Bioethics Advisory Commission).

\textsuperscript{81} See NBAC REPORT, supra note 78, at i.

\textsuperscript{82} See NBAC REPORT, supra note 78, at 49 (noting that "[a]t one end of the spectrum of attitudes is the view that the embryo is a mere cluster of cells . . . . At the other . . . is the view that embryos should be considered in the same moral category as children or adults").

\textsuperscript{83} Id. at 50.

\textsuperscript{84} See id. at ii--iii.

\textsuperscript{85} Id. at iii.

\textsuperscript{86} See \textit{JOHN PAUL II, ENCYCLICAL, EVANGELIUM VITAE} (Mar. 25, 1995 [hereinafter \textit{EVANGELIUM VITAE}], http://www.vatican.va/offices/index.htm#E (last
prior to the NBAC’s recommendation, Pope John Paul II issued a warning about the collective dehumanizing consequence of society’s modern tendency to view and use life in a utilitarian manner. The Pope urged recognition of the “gospel of life” and rejection of the “culture of death,” in which everything, including life, becomes valuable only for its utility or its efficiency.

The NBAC found that an embryo is not the full equivalent of a “human life” because it lacks the same capacities as an adult human being. It also found that an embryo deserves “some respect,” because of its potential to actualize those capacities, but the “respect” afforded by its guidelines—requiring free consent of embryonic donors and prohibiting donation in return for payment—protects society as a whole more than the embryo. In practice, these guidelines offer no more protection to the developing embryo than to the cold heart of a cadaver.

The capacities of any one human being at any one particular time depend on many factors. At one extreme, a person may be rendered comatose by disease or injury and kept alive solely by medical technology. Do we consider this person to be less than human? The individual does not lose protection of the law because he or she does not sit up and take notice of the world; indeed, the individual is fully protected until the final plug is pulled and brain waves cease. By the same token, while one may not consider an embryo human, the fact that it has not yet attained its full capacity should not form the basis for casting it beyond the protection of the law. The position that an embryo

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87 See id. For an excellent evaluation of the Evangelium Vitae (which, translated, means “gospel of life”), and its application to the embryonic stem cell debate, see Sharon M. Parker, Comment, Bringing the “Gospel of Life” to American Jurisprudence: A Religious, Ethical and Philosophical Critique of Federal Funding for Embryonic Stem Cell Research, 17 J. CONTEMP. HEALTH L. & POL’Y 771, 793–94 (2001).

88 See EVANGELIUM VITAE, supra note 86; see also Parker, supra note 87, at 794.

89 See Parker, supra note 87, at 794 (noting that “a human life which would require more care and acceptance (e.g., because of physical or mental impairments) is ‘considered useless, or held to be an intolerable burden, and therefore rejected in one way or another’”).

There are those, like Mary Anne Warren, Professor of Philosophy at San Francisco State University, who argue that, rather than one’s general capacity, it is the verified presence of consciousness that defines personhood. Since it is consciousness that unifies humanity’s “moral community,” then it ought to be consciousness that compels legal protection of the person. Since those who have
is not human because it lacks the capacities we associate with humanness is fraught with philosophical danger. One may counter, for example, that the capacity of an embryo is no less than the capacity of a comatose patient; it is simply easier to dehumanize that which we cannot see.

The NBAC’s conclusion, nevertheless, begs the question: Is an embryo human life? Where politicians, scientists, philosophers, religious thinkers, and the public continue to disagree, the Supreme Court must intervene.

IV. VIABILITY

In Roe v. Wade, the Court acknowledged the “sensitive and emotional nature of the abortion controversy, . . . and of the deep and seemingly absolute convictions that the subject inspires.” 90 The Court, nevertheless, reached its conclusion on the basis of modern medical science, employing “new thinking about an old issue.” 91 Indeed, at the turn of the twentieth century, Blackstone stated that “life begins, in contemplation of law, as soon as the infant is able to stir in the mother’s womb.” 92 By 1973, when Roe was decided, “embryological . . . and medical techniques” 93 had vastly advanced our understanding of gestation and rendered protective laws based on the “quickening” 94 of a fetus outmoded.

become comatose—“defective human beings, with no appreciable mental capacity”—and fetuses presumably lack consciousness, they are not a part of the moral community and thus are not entitled to legal protection. See id. at 795 n.164 (quoting Mary Anne Warren, On the Moral and Legal Status of Abortion, in ETHICAL ISSUES IN MODERN MEDICINE 276, 281 (John D. Arras & Nancy K. Rhoden, eds., 1989). In its report, the NBAC relied upon the thoughts of Warren. See NBAC REPORT, supra note 78 at 50.

91 Id.
92 1 WILLIAM BLACKSTONE, COMMENTARIES *129.
93 Roe, 410 U.S. at 161 (“Substantial problems for precise definition of [Blackstone’s] view are posed, however, by new embryological data that purport to indicate that conception is a ‘process’ over time, rather than an event, and by new medical techniques.”).
94 See State v. Patterson, 181 P. 609, 610 (Kan. 1919). In Patterson, a man was charged with giving a woman drugs in an attempt to end her pregnancy. The indictment, however, referred to the fetus merely as a “vitalized embryo,” and, as the court stated, a vitalized embryo is not the same thing as a quick child. This distinction was important because a vitalized embryo was unprotected, whereas the quickening child was fully protected. Significantly, the court noted, “Any human embryo which is not dead is ‘vitalized.’ It is not less endowed with life before reaching the state of development known as quickening than after.” Id.; see also Taylor v. Rice, 27 F. 264 (D. Ind. 1886); Weightnovel v. State, 35 So. 856 (Fla. 1903);
A. Roe v. Wade: Viability in Trimesters

The issue before the Court in Roe, of course, was not the legal status of the embryo; rather, it was whether, and when, the state may interfere with an individual's fundamental right to privacy—an issue of substantive due process implied by the Fourteenth Amendment. In evaluating whether the right to abortion is a part of that penumbra of privacy rights derived from the Bill of Rights, the Court considered the countervailing interests of the state to protect the unborn, as well as the interests of the unborn themselves. The Court found that the interests of the fetus and those of the mother "are separate and distinct. Each grows in substantiality as the woman approaches term and at a point during pregnancy, each becomes 'compelling.'" The point when these interests became sufficiently compelling is the point of "viability."

The Court's holding in Roe has become deeply ingrained in our nation's collective consciousness. Writing for the majority, Justice Blackmun essentially held that the state's interest in protecting potential life was legitimate, but that a woman's right to choose abortion was fundamental, and as such, the state could not interfere with her right to terminate her pregnancy prior to

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State v. Hatch, 112 P. 149 (Kan. 1910); Lamb v. State, 10 A. 208 (Md. 1887); State v. Emerich, 87 Mo. 110 (Mo. 1885).
95 Roe, 410 U.S. at 116 ("Our task, of course, is to resolve the issue by constitutional measurement . . . .")
96 Id. at 129 ("Appellant would discover this right in the concept of personal 'liberty' embodied in the Fourteenth Amendment's Due Process Clause; or in personal, marital, familial, and sexual privacy said to be protected by the Bill of Rights or its penumbras . . . .")
97 The Court explained: With respect to the State's important and legitimate interest in the health of the mother, the 'compelling' point, in the light of present medical knowledge, is at approximately the end of the first trimester. This is so because of the now-established medical fact . . . that until the end of the first trimester mortality in abortion may be less than mortality in normal childbirth.
98 Id. at 163.
99 Id. at 162 (analyzing the legal status of the embryo in state criminal and civil laws and concluding that "the unborn have never been recognized in the law as persons in the whole sense").
100 Id. at 162–63.
101 Id. at 163 ("This is so because the fetus then presumably has the capability of meaningful life outside the mother's womb. State regulation protective of fetal life after viability thus has both logical and biological justifications.")
the first trimester. The Court's conclusion was based on the finding that the state's interest in protecting the fetus during the first trimester was outweighed by the woman's interest in controlling her own reproductive life because during the first trimester (up to twelve weeks) the potential life was not yet viable. The Court held, however, that during the third trimester (usually seven months) the woman's interest was subordinate to the state's because at that point, the fetus was a viable life, capable of survival independent of the mother. As a result, the third trimester became the cornerstone of the fetus's legal protection, as well as its threshold to moral standing as a human being.

B. Planned Parenthood v. Casey: Viability Beyond the Womb

In Planned Parenthood v. Casey, Justice O'Connor opened the Court's opinion by stating, "Liberty finds no refuge in a jurisprudence of doubt." Nineteen years after Roe, the nation remained deeply divided on the issue of abortion, and the Court's opinion in Casey, only in part a majority decision and in part a mere plurality, reflects that fragmentation. In a rare display of passionately emphatic writing, the plurality reaffirmed the "essential holding" of Roe: Government may not interfere with a woman's choice to terminate her pre-viable fetus. It was the woman's fundamental right "to retain the ultimate control over

101 Id. at 164.
102 See id. at 160.
104 Id. at 844.
105 Justices O'Connor, Kennedy, Souter, Blackmun, and Stevens all concurred in that part of the decision to reaffirm a woman's fundamental right to choose pre-viability abortion; Chief Justice Rehnquist, along with Justices White, Scalia, and Thomas wished to overrule Roe in its entirety. See id.; JOHN E. NOWAK & RONALD D. ROTUNDA, CONSTITUTIONAL LAW 873–75 (6th ed. 2000).
106 After numerous repetitions of affirmation of the holding in Roe, Justice O'Connor concluded:
Our Constitution is a covenant running from the first generation of Americans to us and then to future generations. It is a coherent succession. Each generation must learn anew that the Constitution's written terms embody ideas and aspirations that must survive more ages than one. We accept our responsibility not to retreat from interpreting the full meaning of the covenant in light of all of our precedents. We invoke it once again to define the freedom guaranteed by the Constitution's own promise.

Casey, 505 U.S. at 901.
107 See id. at 870.
her destiny and her body" that the Court found to be the "component of liberty we cannot renounce."

While the Court decisively upheld Roe's protection of a woman's right to choose a pre-viability abortion, a second, and more significant aspect of the decision came from the plurality's three swing votes—O'Connor, Kennedy, and Souter. This was the decision to reject the "rigid trimester framework" that Roe had used to define viability. The rejection of this structure was due in large part to the need, perceived by these three Justices, for reconciliation of the woman's interest in liberty with the inversely increasing interests of the state "in promoting prenatal life." The Court made clear that the state's interest in protecting potential life does not wait for three months after conception to emerge. On the contrary, as Justice O'Connor stated, "there is a substantial state interest in potential life throughout pregnancy." The plurality expressly acknowledged the state's right to regulate pre-viability abortion, so long as the purpose or effect of that regulation was not to frustrate a woman's right to exercise her right to liberty. "Only where state regulation imposes an undue burden on a woman's ability to make this decision does the power of the State reach into the heart of the liberty protected by the Due Process Clause." Roe's trimester framework denied the state its interest by forbidding absolutely any promotion of that interest in protecting fetal life for the first three months of pregnancy. Thus, the

108 Id. at 869.
109 Id. at 871.
110 See id. at 873. Only Justices Blackmun and Stevens dissented to this part. Justice Blackmun, who had authored the majority opinion in Roe, was the only member who wanted to uphold Roe's trimester approach; Justice Stevens wanted to use a case-by-case approach. Chief Justice Rehnquist, along with Justices White, Scalia, and Thomas, wished to overrule Roe entirely, and as such, rejected its trimester format inherently. See NOWAK & ROTUNDA, supra note 105, at 874–75.
111 Casey, 505 U.S. at 875. Furthermore:
A logical reading of the central holding in Roe itself, and a necessary reconciliation of the liberty of the woman and the interest of the State in promoting prenatal life, require, in our view, that we abandon the trimester framework as a rigid prohibition on all pre-viability regulation aimed at the protection of fetal life.

Id.
112 Id. at 876.
113 See id. at 874.
114 Id.
115 See id. at 875–76.
Court abandoned Roe's trimester approach and drew a new bright line at which the "object of the state protection . . . overrides the rights of the woman"—fetal viability.\textsuperscript{116}

The Court did not add to Roe's definition of viability, it simply adopted the meaning by reference.\textsuperscript{117} Whether this possibility occurs at twenty eight weeks, as held in Roe, or at twenty-four weeks, as neonatal medicine had proved possible when Casey was decided, the Court deemed to be irrelevant.\textsuperscript{118}

In the years following Casey, the Court has consistently adhered to this definition.\textsuperscript{119} In hindsight, however, the Court's justification of its adherence to the viability standard seems an eerie harbinger of the embryonic stem cell research that would come to invalidate it:

[T]here is no line other than viability which is more workable. To be sure, as we have said, there may be some medical developments that affect the precise point of viability, . . . but this is an imprecision within tolerable limits given that the medical community and all those who must apply its discoveries will continue to explore the matter.\textsuperscript{120}

\section*{C. Somatic Cell Nuclear Transfer: Viability in a Petrie Dish}

Just five years after the Court decided Casey, on February 24, 1997, Americans met Dolly, the first mammal created by cloning.\textsuperscript{121} Thus entered the Brave New World\textsuperscript{122} of somatic cell

\begin{footnotesize}
\begin{enumerate}
\item Id. at 870.
\item Id. ("The concept of viability, as we noted in Roe, is the time at which there is a realistic possibility of maintaining and nourishing a life outside the womb . . . ").
\item Id. at 860.
\item See Stenberg v. Carhart, 530 U.S. 914 (2000) (holding that the state may not prohibit partial-birth abortion without providing an exception for the mother's health); see also Gail Glidewell, Note, 'Partial Birth' Abortion and the Health Exception: Protecting Maternal Health or Risking Abortion on Demand?, 28 FORDHAM URB. L.J. 1089, 1111 (2001).
\item Casey, 505 U.S. at 870.
\item See Human Cloning Hearing, supra, note 64 (statement of Alexander Morgan Capron, Commissioner, National Bioethics Advisory Commission).
\item In his prophetic book, Aldous Huxley wrote:
The Predestinators send in their figures to the Fertilizers.
Who give them the embryos they ask for.
And the bottles come in here to be predestinated in detail.
After which they are sent down to the Embryo Store.
\end{enumerate}
\end{footnotesize}
nuclear transfer, a science that raises questions concerning our understanding of life and its beginnings. As previously discussed, scientists currently researching stem cell therapies obtain embryonic cells in one of three ways: from aborted fetal material, from frozen embryos, and through somatic cell nuclear transfer (SCNT). Simplistically speaking, SCNT goes something like this: Take any two cells and place them side by side—one in which the nucleus has been removed, the other remaining whole. Given the proper laboratory conditions, these two cells, like magnetic polar opposites, will suddenly fuse, and so fused, begin to divide, simulating the mitosis of inter-womb gestation, and generating the very stem cells of which we are made. Technically, therefore, "the time at which there is a realistic possibility of maintaining and nourishing a life outside the womb" has been pushed to a point well before the Court's window of twenty four to twenty eight weeks.

Scientists acknowledge that the 64 existing cell lines from previously destroyed embryos allowed by President Bush's federal funding restriction are sufficient to "get the research started", however, scientists also acknowledge that "64 is not enough" to develop the basic research into curative therapies. As some researchers experience stunning breakthroughs with the existing cells, others continue to hurtle toward alternative sources of cells—namely cloning. Consequently, Congress is barely able to keep pace with scientific developments as it attempts to craft appropriate legislation.

For example, in July 2001, Advanced Cell Technology, a Massachusetts-based biotechnology firm, declared its intention to proceed with its project to mass-produce human embryos

Where we now proceed ourselves.

ALDOUS HUXLEY, BRAVE NEW WORLD 6–7 (Harper & Row 1965) (1922).

123 See supra notes 60–62 and accompanying text.
124 See NIOH, supra note 48.
125 Casey, 505 U.S. at 870.
126 See Stolberg, supra note 68, at A15 (quoting Dr. James A. Thomson).
127 See id.
128 See Mike Pezzella, Controversy Continues to Swirl Around Estimates of Stem Cell Lines, BIOTECHNOLOGY NEWSWATCH, Sept. 17, 2001, at 1 (reporting the announcement of Dr. James A. Thomson that his researchers had just stimulated human cells from one of the existing lines of stem cells into blood cells by mixing it in with the developing blood cells of mice).
129 See Stolberg, supra note 68, at A15.
through somatic cell nuclear transfer in order to supply stem cells for therapeutic research. On July 31, 2001, the House passed its anti-cloning bill, which is currently being debated in the Senate. If passed, this bill would criminalize all cloning, not only "reproductive cloning" (for the purpose of, like Dolly, growing a duplicated baby, which most people find morally reprehensible), but also "therapeutic cloning" (one of the three acknowledged methods of deriving embryonic stem cells, as conducted by Advanced Cell Technologies). Meanwhile, Advanced Cell Technologies has isolated undifferentiated stem cells without cloning, through a process of parthenogenesis—the division of unfertilized cells that is common to reptilian reproduction, but which causes severe malformations in human embryos. Simultaneously, other firms continue work on "oooplasmic transfer," where embryonic stem cells are replicated by fusing an egg cell from which the nucleus has been removed with ordinary adult cells.

Scientists have not yet grown an entire human being in the laboratory. The development of human life still depends on the mysterious nurturing of the womb. Even Dolly was born from an organic womb. Yet, with the breathtaking innovations of contemporary research, one almost expects its achievement, even as one hopes it is impossible. As Justice O'Connor said, "At the heart of liberty is the right to define one's own concept of existence, of meaning, of the universe, and of the mystery of human life." All the desired cures notwithstanding, one cannot but hope that science goes so far and no further, that it somehow fails to turn that "mystery of human life" into nothing more than warm nostalgia.

131 See CNN Live This Morning (CNN television broadcast, July 31, 2001).
132 See supra notes 71–74 and accompanying text.
133 See supra notes 71–74 and accompanying text.
134 Literally meaning "virgin generation," parthenogenesis is defined as "[a] form of nonsexual reproduction . . . in which the female reproduces its kind without fecundation by the male." STEDMAN'S MEDICAL DICTIONARY, supra note 47, at 1309.
135 See Westphal, supra note 37, at 14; see also Letter from Bernard A. Schwetz, Acting Principal Deputy Commissioner, Department of Health and Human Services, to Senators Edward M. Kennedy and Judd A. Gregg (Sept. 5, 2001), at http://www.fda.gov/oc/stemcells/kennedyltr.html (urging the Senate to provide close scrutiny of "xenotransplantation," in which embryonic stem cells are created by combination of human and non-human cells).
136 See Westphal, supra note 37, at 14.
V. APPROACHING LIFE: THE COUNTERINTUITIVE INFLUENCE OF SCIENCE

Since Casey, the Supreme Court has yet to hear any case in which regenerative science challenges its viability standard. Nonetheless, the velocity at which scientists move toward applications of stem cells to cure disease seems to increase with each passing day. Challenges to any restrictive legislation cannot be far behind.

The questions inevitably presented to the Supreme Court will arise within the context of these new conditions, where the issues turn neither on the woman's nor the state's interest. Since viability has regressed to the point of cellular mitosis, the day has arrived when the question is whether an embryo itself is a person with legally protectable interests. It seems likely, though by no means certain, that the Court would avoid a challenge to its viability standard by restricting that standard solely to abortion issues. Given the absence of any other

138 See Parker, supra note 87, at 785–89 (summarizing the few lower court decisions involving embryo research).

In Doe v. Shalala, 862 F. Supp. 1421 (D. Md. 1994), the plaintiffs, “Mary Doe” (an unspecified embryo) and Michael Policastro (an adult with Downs Syndrome) sought to enjoin a National Institute of Health Human Embryo Research Panel from issuing its report in favor of federal funding for embryonic research. Id. at 1425. The District Court dismissed the case for lack of standing. Relying on Roe v. Wade, the court stated that the an embryo is not a person with “legally protectable interests.” Id. at 1426.

In Davis v. Davis, 842 S.W.2d 588 (Tenn. 1992), a divorce action lead to a property dispute over embryos frozen during marriage for the purpose of in vitro fertilization. Mary Sue Davis wanted to donate the embryos to another couple; Junior Lewis Davis wanted to discard them. Id. at 589. The trial court concluded that the precedent of Roe v. Wade was limited to abortion facts and as such determined that an embryo was a person with protectable interests. Id. at 595. The appellate court reversed, holding that an embryo was implicitly property of the parties. Id. The state supreme court affirmed, but modified the definition of an embryo as property, noting that due to its potential to become a person, it deserves more respect that mere property. Id. at 597. This view was similar to the view of the National Bioethics Advisory Commission in its report on stem cell research. See NBAC REPORT, supra note 78.

Recently, the Wisconsin Alumni Research Foundation (WARF), of the University of Wisconsin, filed a complaint in federal court against California-based Geron Corporation, which had obtained spin-off rights from the Dolly research. The complaint involves a patent dispute over development of stem cell technologies. See WARF v. Geron Corp., No. 01C 0459 C (D. Wis. filed Aug. 9, 2001). Although the case was ultimately settled and involves none of the ethical questions presented by the research, it nevertheless foreshadows the vast potential for future litigation. See David Hechler, Stem Cell Deals, THE NAT'L L.J., Oct. 8, 2001, at A15.
standard for these unprecedented circumstances, however, the Court must create a method by which it can evaluate the interests of an embryo.\textsuperscript{139}

As discussed, the National Bioethics Advisory Commission stated that an embryo deserves some respect. “Although... human embryos deserve respect as a form of human life,”\textsuperscript{140} the larger interests of society in “the scientific and clinical benefits of stem cell research should not be foregone.”\textsuperscript{141} Conversely, in his limitation of federal funding, President Bush stated that an embryo merits full respect: “Like a snowflake, each of these embryos is unique, with the unique genetic potential of an individual human being... a sacred gift from our Creator.”\textsuperscript{142} Influenced perhaps by his meeting with Pope John Paul, President Bush shares the Pope’s “worry about a culture that devalues life.”\textsuperscript{143} He acknowledged that “[r]esearch offers hope that millions of our loved ones may be cured of a disease and rid of their suffering,” but remained firm in his belief that “[e]ven the most noble ends do not justify any means.”\textsuperscript{144}

For those of us inveterate champions of Roe and Casey, our defense through the years has necessarily concentrated on protecting a woman’s most intimate power—the control, management, and movement of her own body—against invasions that are all too often characterized by violence. As an element of this critical focus, many of us have committed to a view of the

\textsuperscript{139} Of the three sources of embryonic stem cells, aborted fetuses seem to present the least interests in their own right, as their “lives” have already been terminated by the abortive procedure. This area, however, is fraught with fear, as legislators speculate that allowance of derivation from aborted fetuses will serve to encourage abortion. See Curtis E. Harris & Stephen P. Alcorn, To Solve a Deadly Shortage: Economic Incentives for Human Organ Donation, 16 ISSUES L. & MED. 213, 220 (2001). Some argue, however, that as long as the right to abortion is a fundamental interest, the controversy over abortion should not obstruct scientific progress. See Jose L. Gonzalez, The Legitimization of Fetal Tissue Transplantation Research Under Roe v. Wade, 34 CREIGHTON L. REV. 895, 924 (stating that “[t]he tissue’s abortion source is merely a tangential, politically contaminated Gordian knot that need not entangle the long practiced and widely upheld principal purpose for pursuing any medical research; that is, the potential benefits to others to be gained by the process.”).

\textsuperscript{140} NBAC REPORT, supra note 78, at ii.

\textsuperscript{141} Id. at xi.

\textsuperscript{142} Remarks by the President on Stem Cell Research, supra note 66.

\textsuperscript{143} Id.

\textsuperscript{144} Id.
embryo as simply rapidly-dividing cellular material, albeit imbued with potential to develop into a fetus. One of the remarkable conundrums of science, however, is that the more it reveals, the less it seems to explain, and at quantum level, science seems to blur with religion, or at least certain metaphysical paradigms of spirituality. In revealing the phenomenal power of a fertilized cell to transmogrify into any one of the myriad parts that sustain life, science has made that power seem ever more mysterious, a sermon traditionally assigned to religion.\footnote{In the cyberized, simulated, post-modern culture, long past the Nietzschean pronouncement of the death of God, a culture criticized by Pope John Paul, people from all walks of religious and non-religious life still search for some universal principal and proof of the indestructibility of the human soul.}

These difficult questions remain. One need not lose a loved one or succumb oneself to a saddening and painful disease or injury to recognize the legitimate urgency of finding cures. From this intimate perspective, it seems absurd to imbue cellular matter the size of a pinhead with human interests. On the other hand, even a superficial study of this research is enough to cause one to wrestle with the continuum of "aliveness" and with the inherent difficulty of line drawing.\footnote{One is reminded of the court's position in the classic case of \textit{Regina v. Dudley & Stevens}, which involved cannibalism on the high seas by a starving crew that believed it was otherwise destined for certain death: It must not be supposed that in refusing to admit temptation to be an excuse for crime it is forgotten how terrible the temptation was; how awful the suffering; how hard in such trials to keep the judgment straight and the conduct pure. We are often compelled to set up standards we cannot reach ourselves, and to lay down rules which we could not ourselves satisfy.} Whether fueled by God, a universal spirit, or simply an enduring restorative energy, the power of life, ironically, seems never more human than when it is expressed by its potential.

In the coming years, the Supreme Court will inevitably change, as some justices retire and others replace them, but one thing is almost certain: The Court will once again find itself in the "storm center of controversy."\footnote{W. ROBERT GOEDECKE, \textit{CHANGE AND THE LAW} 231 (1969).} This time, however, the controversy will not involve the liberty interests of individual women, as addressed in \textit{Roe} and \textit{Casey}, but rather, what \textit{Roe} and \textit{Casey} left open—namely, the liberty interests of the embryo.
against the health and safety interests of those who might benefit from its sacrifice.\textsuperscript{148} Unquestionably, the justices will, as they always have, conduct a reasoned analysis from an emotionally detached perspective. Nevertheless, strong and conflicting views about such a fundamental subject will inevitably inform their decision. In the end, the particular facts will arise before the Court and the unforeseen cures for millions of our loved ones, the legal and moral rights of an embryo, and the viability of our humanity that these conflicting interests challenge will hang in their esteemed balance.

\textsuperscript{148} However it is phrased, this issue is likely to center on utilitarian principals ingrained in our judicial system. Classical utilitarianism, originally formulated in the 1800s by Jeremy Bentham posits that "the purpose of all laws is to maximize the net happiness of society." See \textsc{Joshua Dressler}, \textsc{Understanding Criminal Law} 9 (2nd ed. 1995). This principal was acutely dramatized in the recent tragic story of the Siamese twins born to a couple living on the English-governed island of Malta. The twins were conjoined in such a way that they shared vital organs, and doctors predicted that, unless they were separated, they would both die within days. Separation would increase the chances of one twin surviving, but would kill the other. Against the wishes of the parents, who were devout Catholics, the English Court of Appeal ordered separation and immunized the doctors against murder charges. See Kevin Cullen, \textit{In London, An Agonizing Decision}, THE BOSTON GLOBE, Sept. 11, 2000, at A1; Simon Lee, \textit{Babies' Lives in the Judges Scales}, 27 hum. Life Rev. 40 (2001).