



Chapter Eleven

"...And Start All Over Again"

*The ... more and more unfolding of
nature's secrets implies there was a
divine healer.*

-attributed to Sir Thomas More

Thank you to Senator Hatch and his publisher, Basic Books, for allowing us to distribute this copywritten chapter from his book. We hope that this information will lead to a greater understanding of the principals involved in using regenerative medicine.

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Politics never stops, and neither does Congress. There is always a new issue, a new concept to learn and understand. Even as old battles are fought and refought, every year at least one problem emerges that is truly novel. You have to devote considerable time simply to understanding the principles and issues involved before you can even begin to make a constructive judgment.

In 2001, a constituent named Cody Anderson of West Jordan, Utah, came to see me. He had a problem and, after we had talked, I promised to do everything I could to help. Our meeting was no different from thousands of similar encounters I have had with people from my state and around the country who are looking for advice, guidance and help. Except for one thing.

Cody was four years old. Articulate, cute and courageous, he is a remarkable young man, but then his life is like that of no other child I have ever known.

At age two, he was diagnosed with a particularly virulent form of juvenile diabetes. To live, he needs a mechanical pump to maintain his daily insulin level. The spot where the pump enters his body must be changed at least three or four times a week. In addition, his blood must be drawn six to ten times a day. Every bite of food he takes has to be monitored for carbohydrates so he can be given the correct amount of insulin. Something as simple or routine as a common cold can have a devastating effect on his health. Even growing, a normal and wonderful part of a child's life, poses a risk.

For Cody's parents, the future is a terrifying prospect. He was named after his grandfather, who had the same disease and died at age forty-seven after surviving twenty-eight operations. Grandpa Cody lost his left leg below the knee, lost toes from his right foot, had a colostomy, went blind, had to have his blind left eye removed to relieve the pressure and pain, and lost kidney function, forcing him to be on dialysis for the last ten years of his life. Each of these is a well-known possible complication of diabetes. Grandpa Cody's disease was so severe, however, that he endured all the complications at a much younger age than most diabetes sufferers, who may be afflicted with only one or two.

According to the doctors, Cody faces the same fate. Unless something can be done, unless a medicine can be discovered or a new medical technique invented that can change what now appears to be inevitable, he can expect a life of pain and discomfort that will worsen with each passing year.

Fortunately, a new field of research is opening that may dramatically alter the treatment not only of diabetes but also of prevalent and debilitating diseases such as cancer, heart disease, Alzheimer's, Parkinson's, ALS and multiple sclerosis. Cody and his parents had come to see me to tell me how important it was that the government support this research, because its future may well depend more on the Politics involved than its scientific potential.

The scientific community calls it regenerative medicine. Others call it human cloning.

When a complex issue of this kind is first brought to your attention, it's hard not to respond emotionally before understanding all that may be involved. Before doing or saying anything publicly, I decided to learn as much as I could about this new field of science and the recommendations and objections of the interested parties. Calling on relationships built over two decades of working on public health issues, I met with as many experts and laypeople as I could.

I sought out Nobel laureates who have been studying the issue for years. I learned about the ongoing research at Advanced Cell Technology Corporation and the Geron Corporation. I met with families who are at risk, theologians from a variety of denominations, social scientists, ethicists and political activists from both sides.

The normally cautious Harold Varmus, the former director of the National Institutes of Health, a Nobel Prize winner, and the current head of Memorial Sloan-Kettering Cancer Center, shared his excitement about the new technology. He compared the potential impact of regenerative medicine on science to that of splitting the atom and mapping the human genome. Steven Prescott, Executive Director of the Huntsman Cancer Institute, explained how this research could allow scientists to work backwards, as if they were solving a crime, to determine how a disease develops. Nothing else offers such promise. Mario Capecchi, a professor of biology at the University of Utah, told me about his research on mice and its potential impact for understanding genetic diseases such as cystic fibrosis and muscular dystrophy.

Leon Kass, the University of Chicago ethicist and current head of President Bush's Bioethics Commission, discussed the moral opportunities and dilemmas that were involved. Never judgmental, he worked through the competing opinions with me and stressed the need to consider regenerative medicine's impact not only on science but also on our future as human beings. Curt I. Civin, a nationally known professor of pediatric oncology at Johns Hopkins University, described in detail why an unfertilized egg is a human cell as opposed to a human *being*, and why embryonic stem cell research is so critical. Irving Weissman, a professor at Stanford Medical Center and an expert in adult stem cell research, told me that despite spending his career on adult stem cells, he believes embryonic stem cells hold unique promise and their study must be pursued.

Richard Doerflinger, the associate director of the Conference of Catholic Bishops, provided a detailed and heartfelt explanation of his church's perception of when life begins and the inviolability of life.

What I learned from these discussions was both fascinating and a little troubling. The potential of stem cell research is truly boundless. By understanding how cells become specialized for particular functions, we can learn what happens within a cell to cause abnormal growth and division, which is often the cause of disease and birth defects. By learning how to direct or modify cell growth, eventually we might be able to replace damaged or malfunctioning cells with healthy ones.

For instance, Cody Anderson has diabetes because the cells in his pancreas that produce insulin are destroyed or disabled. Stem cell research may allow doctors one day to replace these cells with new ones that function normally, saving him from the life of pain his grandfather endured.

Moreover, this research may help solve the two biggest problems associated with organ transplantation and the use of donated tissue: shortage of supplies and rejection of transplants.

In sum, the promise of regenerative medicine cuts across all fields of medicine and touches everyone who either has a chronic disease or who may develop one or suffers a traumatic injury. If its complete potential is realized, treatments could be developed to address not only fatal and life-altering diseases but also injuries and degeneration, including stroke, burns and arthritis.

Unfortunately, regenerative medicine also raises significant problems. There is the basic question about the proper limitations of science and whether support for legitimate and needed research can be misused to fund experimentation with human creation. We are forced to confront, in far greater detail than ever before, what we know and believe about life and human creation.

To understand what is involved, you need a little basic knowledge about human biology. It is estimated that every human cell contains the same group of roughly 30,000 to 50,000 genes. This group of genes provides the blueprint for everything the cells do: how they grow and specialize, how they organize themselves into tissues and organs, and how those tissues and organs function to keep us alive. But not all cells use the same genes. Only a few of the 30,000 to 50,000 are "turned on" in any one cell.

What determines whether a particular cell becomes a blood, fat, brain or some other type of cell is the specific set of genes activated or deactivated during growth, and the pattern in which this occurs. By knowing which genes to turn on and off, researchers could theoretically grow specific types of cells and eventually specific types of tissues.

Stem cells are relatively unspecialized cells, yet they still have the potential to develop into many different cell types. They are most easily found in embryos at the earliest stages of development, in fetal tissue and in some adult tissue, although isolating adult stem cells is extremely difficult and to date they are far more difficult to grow outside the body. Moreover, embryonic stem cells appear to have a far greater plasticity-the potential for developing into different cell types than adult stem cells.

When a sperm fertilizes an egg, it creates a single totipotent cell, the term for a cell whose potential is unlimited. Out of this single cell will arise not only the embryo but also its surrounding tissues within the womb.

After roughly four days of repeated cycles of cell division, the totipotent cells form what is known as a blastocyst, which contains both an Outer and an inner layer of cells. The two layers have discrete functions. Inside the womb, the outer layer will go on to form the placenta and other supporting tissues needed for fetal development. The inner layer cells are called pluripotent-their potential is large but limited-and they will serve as the basis of all the tissues in the human body. It is these Pluripotent cells that can become stem cells.

Today, fertilization can occur both inside and outside the womb. I have been lucky to be the father of six remarkable children and the grandfather of twenty. Whatever I may have accomplished professionally pales in comparison to the joy I have experienced in my roles as a husband, father and grandfather. Quite simply, my life would not be complete without the happiness and challenges of parenthood. Elaine and I will always consider ourselves blessed. Sadly, not everyone is as fortunate. Through my church work, I have counseled several young couples who were experiencing difficulty in conceiving a child. Some chose to adopt. Others, using in vitro fertilization clinics, were able to have children, an opportunity they feared they had lost forever. Approximately 200,000 babies in America have been born as a result of these clinics.

These clinics can facilitate the fertilization of a human egg in a laboratory. The resulting blastocyst can then be implanted in the mother's womb to trigger pregnancy. But since the procedures normally result in more blastocysts than can be used, there are always extras, many of which are kept frozen. Some will not survive protracted storage. Others, estimated to be tens of thousands each year, will be discarded or destroyed once they are no longer needed.

Scientists recognize these unused blastocysts from in vitro fertilization clinics could provide a source of stem cells for study. Some were voluntarily donated to science and used to create privately funded stem cell lines.

Concurrently, another possible source of stem cells was identified—the use of a technique called "somatic cell nuclear transfer" or "nuclear transplantation." Here, the genetic material from a woman's unfertilized egg (i.e., its twenty-three chromosomes) is removed and replaced with the full complement of genetic material, namely, all forty-six chromosomes, from a specialized cell such as a skin cell from an individual. This artificially manufactured cell is then electrically stimulated, and it will begin to divide and multiply within the laboratory much like a fertilized human egg. In time it will form a blastocyst, and cells from the inner layer can then be used to develop pluripotent stem cell lines. Unfortunately, taking egg stem cells from an unfertilized in vitro blastocyst results in the destruction of the blastocyst. For many religious groups, such as the Right to Life movement, the blastocyst is not merely a group of living human cells but a living human being. They argue that its destruction is no different from the termination of a fetus, even though the blastocyst would be discarded anyway. From their standpoint, taking stem cells from an unfertilized blastocyst is simply another type of abortion. This somatic cell nuclear transfer process also raises a different problem. By replacing all the chromosomes in the egg with the existing DNA of one person, unscrupulous scientists could use this process to clone human babies.

Consequently, any discussion of the relative merits of regenerative medicine is directly impacted, and sometimes limited, by the current debate over cloning and abortion, probably the two most controversial issues in American domestic politics.

Human cloning elicits a nearly universal negative reaction. It immediately creates images of personal duplicates, bizarre experiments and strange asexual beings, characters normally associated with science fiction and horror movies. It *generates a fear that is fundamental* to us all—the potential loss of our own identity—and implies that, somehow, scientists could interfere with God's sacred plan for human reproduction by a husband and a wife.

Until 1997, this concern was largely hypothetical. Then Dr. Ian Wilmut and his team of scientists announced that they had successfully cloned a mammal, a sheep named Dolly, and what was once so abstract became a distinct possibility. Later, Dr. Richard Seed announced his intention to open a human cloning clinic in the United States. Every fear suddenly seemed justified, and Republicans and Democrats quickly voiced their collective opposition.

While feelings about abortion are every bit as strong, there is no equivalent consensus. It would be hard to find a more politically polarizing issue in our nation than abortion, and it has been that way since the Supreme Court's decision in *Roe v. Wade* in 1973, which in effect prohibited states from making abortion illegal.

A few years ago, I learned that one of the Senate staffers with whom I frequently work was pregnant. When I next saw her, I enthusiastically congratulated her and started to talk briefly about the joys of family life. I stopped when I saw her face, which had grown uncharacteristically sullen.

I asked what was wrong. She admitted she was considering having an abortion. Her career was just beginning, and the pregnancy could not have come at a worse time. She had no idea how she could fit a child into the plans she had for herself. She observed, "After all, I should be able to choose what to do with my own body"

The real issue, however, is not whether we have the freedom to choose but what we choose to do with that freedom. To me, the question is not whether we are free to terminate a life for our personal convenience but what moral consequences the choice will have for us, our families, including the unborn child, and society as a whole. If we truly value freedom of choice, are we not also obligated to respect the other choice directly involved, the unborn's desire to live?

Almost all the rights we enjoy in this country are restricted. Some are confined by law, some by their impact on others or by the religious and moral consequences on those directly affected. Is it wrong to assume that there might be a valid restriction on this particular choice?

Since *Roe v. Wade*, the number of abortions in the United States has skyrocketed. Today, there are more than 4,000 abortions performed every day, the vast majority having nothing to do with the life or health of the mother. Irving Cushner, a physician and an abortion advocate, has testified that less than 2 percent of all abortions could be justified as medically expedient. Most are performed for reasons of convenience: The child is not the right sex; he or she may pose a financial burden; the pregnancy comes at an inconvenient time. In fact, no baby is really "unwanted." In my home state of Utah alone, there are nine couples who wish to adopt for every available child. As one adoptive parent stated the other day, "placing a child for adoption is a great act of love-both for the child and for the adoptive couple who, without the child, would never know the joy of being parents." Despite this interest, the number of abortions steadily grows, including late-term abortions. These occur after the twentieth week of pregnancy, the period at which most doctors believe a child may be delivered and survive on its own. Lately, it is not uncommon to hear of a child being aborted during the seventh or eighth month of pregnancy. There also is increasing interest in "partial birth" abortions, a medical procedure so horrendous that it is nothing more than legalized infanticide.

For me, there is simply no justification for such routine taking of life. This is not a question of the life of the mother or instances of rape or incest. This is about the responsibility owed to the life we create, about our adherence to the simple majesty of the biblical command, "Thou shalt not kill." A society that is unwilling to protect its most defenseless and helpless members has lost sight of the most fundamental bond that holds it together: the right and respect of life for those who are alive and capable of defending themselves and those whose voice can be heard only through another.

Every child, both those born and unborn, is unique and capable of making a contribution to family, community and nation, a contribution that no one else can duplicate or replace. The only way to know exactly what that offering will be is to give the child the most important of all opportunities: the chance to live.

Others, however, take a different view and are as adamant and sincere in their convictions as I am in mine. They believe there are different issues involved with different types of abortion and that broad generalizations do not reflect all the personal, medical and social considerations at issue, or how agonizing the decision often is. I respect their right to hold their own opinion about abortion, but I will never understand it is the passion on both sides, coupled with the absence of any plausible middle ground, that makes abortion one of the most significant wedge issues in American politics. These are issues that by themselves can motivate voters and allow candidates to draw sharp distinctions with their competitors.

Understanding this political reality, liberal and conservative strategists are always looking for ways to insert abortion into some other issue. Nothing else plays such a significant role in so many legislative battles. Abortion has come up during the consideration of bills involving foreign relations, federal appropriations, reauthorization of the National Institutes of Health, and military appropriations. As I write this book, desperately needed and widely supported bipartisan bankruptcy reform legislation has stalled yet again; this is because one member of Congress believes that the legislation should include a provision that prohibits a person found guilty of blockading an abortion facility from being discharged in bankruptcy from paying court order judgments. No comparable crime is treated this way. Other members may not agree that this one act should be singled out in a bankruptcy bill, but they cannot afford to be perceived as opposing a pro-choice amendment. As a result, the legislation remains in limbo, although I believe there is a chance we may finally resolve this problem prior to adjournment.

Abortion affects every judicial confirmation, especially those involving nominees to the various courts of appeals and the Supreme Court. One of my colleagues explained during a private session of the Senate judiciary Committee that he would oppose any nominee who is pro-life, notwithstanding any other considerations or issues. Unfortunately, that senator is not alone.

While I obviously disagree with both that senator's position and the imposition of such a rigid litmus test, his motivation is politically understandable. Because of its importance to certain voters, abortion plays a disproportionately important role in elections, especially for Democratic candidates. A Democrat can disagree with his or her party's traditional positions on labor issues, defense spending and even taxes, but only a rare few can risk being pro-life.

Several years ago, I was on an airplane traveling to a city in the Northeast. After takeoff, a flight attendant stopped by my seat. She apologized for bothering me and expressed her appreciation for my service in the Senate. She said she wished I were her senator instead of the ones currently in office, who she felt not only were wrong on economic issues but had a deserved reputation for treating women poorly. I thanked her and said she never needed to apologize for interrupting anyone with such kind remarks.

Before we landed, she stopped by my seat again and asked where I stood on abortion. I explained that I was pro-life. She sighed and shook her head. She said she could never vote for anyone who was not pro-choice, no matter what other issues were involved.

"Why?" I asked.

"I had an abortion years ago, when it was unlawful to have one, and it ruined my life. I never was able to have children. If abortion had been legal, I would have been able to go to a good doctor instead of the butcher I had." I expressed my profound sympathy for what happened but suggested that one issue alone should not determine how she votes. She disagreed and maintained that while she agreed with almost everything I was doing, she could never vote for me. Even if it came to a choice between a pro-life candidate with whom she agreed on every other issue and a pro-choice candidate who had a horrible record substantively and was personally abusive toward women, she would vote for the latter. She went on to explain that every one of her friends had gone through an abortion, and pointed out that most women her age either have had an abortion to save their sanity or health or know someone who has had one for those reasons.

For the rest of the flight, I thought about what she had said, wondering if we really had

reached a point in this country where this one issue outweighs every other. Does abortion provide certain Democrats a free pass on other political positions or on personal behavior? Are there that many women who could never support a pro-life candidate, regardless of every other consideration?

Fortunately, the answer appears to be no, at least in general. People such as Senators Gordon Smith of Oregon, Mike DeWine of Ohio, and Rick Santorum of Pennsylvania are elected in states that are considered politically moderate or even liberal, even though they are pro-life. Still, it is clear that for at least some discernible part of the population, being pro-choice is a litmus test that supersedes all others. When this happens in politics, any consideration and discussion of the issue automatically becomes more complex and difficult to resolve. The debate gravitates to the extremes on both sides.

Consequently, it was no surprise that once people began to understand what was actually involved in stem cell research, hard lines immediately began to form. Several religious and pro-life organizations quickly made clear their fundamental opposition both to using leftover fertilized embryos from in vitro fertilization clinics and unfertilized blastocysts derived from the somatic cell nuclear transfer process.

Most of their arguments were based on the proposition that a blastocyst or embryo, no matter its origin or use, is in fact a human being. For these groups, the debate over stem cells was really a question of whether a person could cease having individual value and could be sacrificed involuntarily to preserve the life and health of others.

Senator Sam Brownback of Kansas, an intelligent and principled pro-life advocate, described the issue this way:

The central question in this debate is simple: Is the embryo a person or a piece of property? If you believe... that life begins at conception and that the human embryo is a person fully deserving of dignity and the protection of our laws, then you believe that we must protect this innocent life from harm and destruction.

Several national pro-life organizations quickly made it clear that there was only one position they would find acceptable-embryonic stem cell research must be banned under any and all circumstances. No legitimate commercial or scientific benefit could come from what they described as the "slaughter of the innocent."

Others disagreed. A coalition of doctors, scientists, Nobel laureates, patient advocates and biotech executives was organized to make the alternative argument-that responsible stem cell research could provide the medical answer to a wide variety of conditions and diseases suffered by an estimated 128 million Americans for which there is no other solution but pain and death.

Former Senator Connie Mack of Florida, a pro-life leader, made the following observation in an editorial in the Washington Post: It is the stem cells from surplus IVF embryos, donated with the informed consent of couples, that could give researchers the chance to move embryonic stem cell research forward. I believe it would be wrong not to use them to potentially save the lives of people.

Naturally, as the debate intensified, so did the rhetoric. Materials were circulated comparing the study of stem cells to the research performed at Auschwitz by the infamous Nazi scientist Joseph Mengele, and as proof that Aldous Huxley's "brave new world" was now a reality. More and more, criticism was reduced to a simplistic slogan: killing to cure.

The stridency of the opposition to stem cell research echoed previous fears raised about

scientific and medical advancements considered dangerous at the time of their discovery. Some argued that the opposition to regenerative medicine was no different from the Catholic Church's reaction to the proposition by Galileo, Copernicus and Kepler that the Earth revolved around the Sun, or the fears surrounding the discovery of electricity.

It was pointed out that in medieval Europe, several different religious councils banned surgery and postmortem dissection. Not until the mid-1800s was anesthesia considered appropriate for obstetrics patients. Many religious leaders of the time taught that the practice defeated God's intention that women should experience pain during childbirth. This particular debate continued until 1853, when Queen Victoria gave birth with the assistance of chloroform.

As recently as the late 1700s, the well-known English theologian and cleric Edward Massey delivered a sermon titled "The Dangerous and Sinful Practice of Inoculation." It was given at a time when religious leaders and scientists were arguing over the use of vaccines to prevent the spread of smallpox. According to Reverend Massey, "Diseases are sent by Providence for the punishment of sin, and the proposed attempt to prevent them is a diabolical operation.

Then, as now, unfortunately, rhetoric was swallowing the debate. Both sides focused more on the traditional positions and arguments about abortion and cloning than on the more difficult and unique scientific and philosophical issues at the very heart of the new research. In Congress, the issue first came to a head in 2001 over the question of whether President Bush would permit federal funds to be used to fund research on stem cells derived from surplus in vitro fertilization embryos. Both sides weighed in heavily, and the lobbying was intense.

I struggled with what to do. As a pro-life senator, I had played a leading role in numerous fights over abortion, and many of the arguments being made by some of my colleagues, such as Senator Brownback and Representative Chris Smith, resonated with me both personally and professionally. Given my voting record and position on abortion, the obvious political course was to follow the lead of the Right-to-Life community and support a complete ban on this kind of research. It would be far easier-and better for my future electability-to support a ban than to endorse this most promising branch of regenerative medicine. What this position would not do, however, was help Cody Anderson and millions of others suffering from serious chronic diseases.

Moreover, the passionate defense of life should not stop at birth. We have as profound an obligation to a child outside the womb as we do to one inside. To me, an advocate for life has to consider not only our obligations to a group of cells with the potential for life but also our obligation to our fellow citizens-men, women, and children who will face untold suffering and lose many years of life unless there is a medical breakthrough.

Using the information I had gained from all my meetings, I tried to work through the problem in a logical manner. First, was an unimplanted egg fertilized through in vitro fertilization in fact a person? Put another way, was an artificially fertilized egg, frozen and stored in a refrigerator, the equivalent of an embryo or fetus developing in a mother's womb?

Several churches argue that life is sacred from the moment of conception, regardless of how that conception occurs. A fertilized egg contains the entire human genetic code and has the potential to grow into a person. Therefore, to them, it is spiritually and ethically a human being.

Other religions, however, base their support of embryonic stem cell research on their

obligation to assist not just the unborn but the whole spectrum of life, especially when assistance cannot be provided by any other means. To them, ignoring this opportunity would be immoral and unethical.

There is a third perspective, the so-called "developmental" view of life, that an early embryo, before the formation of the primitive streak that will eventually become the spinal cord and brain, does not enjoy the same legal protections as a person. This is based in part on the assessment by some scientists that for the first fourteen days, a fertilized egg is little more than a jumble of cells.

All three positions have thoughtful and sincere supporters. For many, the right interpretation is based on both religious faith and understanding, made all the more difficult as science has forced religions to review their positions on life and creation.

For me, human life begins in a mother's nurturing womb and is impossible without it. The blastocysts used for embryonic stem cell research, whether they are developed through the somatic cell nuclear transfer process or are unused embryos from an in vitro fertilization clinic, are not the same as a person or a fetus. A frozen embryo in a laboratory refrigerator is more akin to a frozen egg or sperm. While each has the potential to contribute to human life, no frozen egg, sperm or embryonic cell can reach personhood absent a mother's womb. There is little debate over the ethical or moral consequences when these are discarded, just as there are few objections when an in vitro clinic discards unused blastocysts.

Oddly, the controversy seems to arise only when blastocysts already scheduled for destruction are used instead for scientific research. As Dr. Louis Guenin has pointed out, stopping embryonic stem cell research does not guarantee that one more baby will be born.

Similarly, there are significant legal problems with the assertion that a blastocyst is the same as a person and thus that the destruction of one is the equivalent of murder. Certainly, no member of the United States Supreme Court has ever taken the position that embryos are constitutionally protected persons, and there is little likelihood that any court would order every "spare" embryo in a clinic to be taken through a full-term pregnancy. This position also conflicts with state law. Under Utah law, for example, an abortion can occur only when a fertilized egg has been implanted in a womb.

If an embryo were the legal equivalent of a person, the use of a variety of contraceptive devices, such as those that impede fertilized eggs from attaching onto the uterine wall, could potentially be considered a criminal act. For in vitro clinics, the routine act of discarding "spare" frozen embryos could become an act of murder and would, at a minimum, be inseparable from an abortion.

Regardless of one's position on abortion, there is little support for this legal result. To successfully create life through in vitro fertilization, extraordinary third-party human involvement and scientific procedures are required. Conversely, while it requires an intentional human act, the purpose of abortion is to end life. The two procedures are polar opposites and should not be considered legally, morally or philosophically equivalent.

There was a second issue to consider. What are the consequences of banning this research?

Some, particularly those in the Right-to-Life community, argue that research on adult stem cells actually holds greater promise than the study of embryonic cells. Although adult stem cell research would clearly offer a preferable political solution, most leading scientific authorities dispute this proposition and assert that embryonic stem cell research is by far the

more promising course to follow at this time. For now, a ban on the use of embryonic cells could materially impede progress, and the hope that this new field represents would be diminished and, perhaps, lost.

In addition, federal involvement in stem cell research will ensure that there are controls and limits on what is being studied and what materials will be used. Experience over the last several decades has proven that federal funds are needed to underwrite most major medical research programs. The private sector simply cannot generate sufficient funding on its own. And with federal dollars come federal controls. Having the research financed by government will help ensure that appropriate limits are honored. To that end, in 2000, the National Institutes of Health published guidelines controlling the direction of the research and what could be studied. The regulations built upon the work of the National Bioethics Advisory Committee, the Advisory Committee to the Director of the National Institutes of Health, and the Human Embryo Research Panel, which was established by President Clinton. More than 50,000 comments were submitted about the guidelines when they were initially published in draft form, ensuring that when finalized they not only would be comprehensive but would pass the inevitable legal challenge. These guidelines require that only stem cells derived from embryos produced for procreation, but not used for that purpose, could be a possible source. No financial or other benefit could be offered to encourage donation, and there must be comprehensive informed consent. Most important, no funds could be used for human cloning.

After reviewing all these factors, I decided we should support the use of federal funds to underwrite controlled research into regenerative medicine, regardless of whether the stem cells are derived from unused blastocysts obtained through in vitro clinics or through somatic cell nuclear transfer applied to unfertilized eggs. This research is fundamentally different scientifically, legally and morally from abortion. Supporting it is both pro-life and pro-family.

If the potential of this field is actually realized, one day a wide range of diseases and degenerative and debilitating conditions can be cured. Lives will be saved and unfathomable pain, suffering and torment will be avoided. The purpose of the research is to save life, not terminate it.

Families of those currently afflicted also deserve consideration. When one of our loved ones is stricken by illness, more than one person is affected. The whole family shares the pain and suffering. To cope with the disease, family members have to make changes in lifestyle, in the home, even in normal daily activities. If successful, stem cell research could liberate not only the sick but their families as well.

I could not, however, find any legal, moral or religious justification for the human cloning of babies. It is morally repugnant and represents a completely unjustified intrusion into the creation of life. Bringing a new human being into the world should be the sacred responsibility of a husband and a wife.

Early in 2001, President Bush halted all federal funding of stem cell research, creating an opportunity for his administration to review the NIH guidelines and existing controls over spending. Advocates and opponents alike immediately weighed in, lobbying both the White House and Congress. Over the next several months, lobbying campaigns were inaugurated, articles began appearing in the press, and interested organizations began issuing pronouncements and analyses.

On June 13, 2001, I sent a letter to President Bush and a more detailed version to Tommy Thompson, the Secretary of Health and Human Services, outlining why I believed the administration should allow research on embryonic stem cells derived from unused blastocysts to continue. I stressed that it was consistent with our mutual pro-life and pro-family values.

I already knew that Secretary Thompson had similar views. When a person is nominated to a cabinet position by the president and thus subject to Senate confirmation, he or she will pay what is called a "courtesy call" to key senators, especially those who serve on committees with jurisdiction over the particular department or agency in question. During Tommy's courtesy call to me earlier in the year, we talked for the better part of an hour, devoting much of the conversation to regenerative medicine. As governor of Wisconsin, he had worked through many of the issues we were now confronting in Congress. I learned he was both pro-life and a proponent of the research.

Reaction to my letters was, to say the least, mixed. The opponents of regenerative medicine chastised me for abandoning my principles and called my reasoning both vacuous and scientifically inaccurate.

The pro-life community expressed its outrage both in Washington and back in Utah, and my state office was swamped with angry calls. On the other side, research proponents praised my judgment, applauded my understanding of the state of the science and commended my courage.

It's taken awhile, but I have learned not to get too excited about either assessment.

The pressure on the White House continued to build as spring turned into summer. On July 16, Representative David Weldon, a Republican from Florida, introduced legislation criminalizing the cloning of embryos for whatever purpose. If enacted, it would bar not only the use of somatic cell nuclear transfer to create stem cells but also the use of therapies based on such cells that are developed overseas. Sam Brownback had already introduced a comparable bill in the Senate.

The Weldon bill was put on a fast track. It moved through a judiciary subcommittee and the full committee in a little over a week, and was brought to the House floor on July 31. There, Representative Jim Greenwood, a Republican from Pennsylvania, offered an amendment to limit the ban to the use of somatic cell nuclear transfer to initiate pregnancy. His proposal was defeated, and the bill was passed by the House on a vote of 265 to 175, only sixteen days after it was introduced.

On August 9, President Bush weighed in. He announced he would permit federally funded research to continue on the estimated sixty existing stem cell lines already developed, but he would bar the spending of funds on any new lines. (The number of cell lines has since grown to approximately eighty, as more qualified cell lines were identified.) The President also announced the formation of a Presidential Council on Bioethics to consider the scientific and ethical ramifications of the research, to be headed by Leon Kass.

It was an ingenious political resolution. While not completely blocking scientific progress, President Bush avoided the considerable risks associated with addressing the more difficult problems involved, such as the legal status of the blastocysts. He did not have to take a position on when life begins with respect to those embryos. Several pro-life organizations, such as James Dobson's Focus on the Family, expressed limited acceptance, as did the National Right to Life Committee. Even Senators Ted Kennedy and Tom Daschle praised the

decision, but noted that it did not go far enough. The number of times this quartet has agreed can be counted on one finger.

Unfortunately, the President's compromise does mean that stem cells derived from the eighty existing stem cell lines will be the only ones studied with federal funding. This group is heavily weighted toward Caucasians and Filipinos. Unless the pool is expanded, there may be insufficient materials to study diseases common to a particular race or ethnicity, such as sickle cell anemia.

This year, the debate has continued in the Senate. Senator Brownback has tried on several occasions to force a vote on his companion legislation to the Weldon bill. He has thirty cosponsors, including one Democrat, Senator Mary Landrieu of Louisiana.

More important, his bill has been endorsed wholeheartedly by President Bush. In a televised announcement, the President acknowledged that while many in the scientific community would disagree with his position, he had moral authority on his side. It was time to stop human cloning before it starts.

Several of the prohibitions in the Brownback bill are troubling, especially the provision making it illegal to use drugs and treatments developed overseas. I thought of Cody Anderson and his parents. I may appear to be personalizing the issue too much by focusing on just one person, but I have found it's often the best way to grasp the moral complexity of a debate.

How could anyone look Cody in the eye and tell him that he could not take a drug that would free him from the disease and pain that otherwise would play such a prominent role in his future? If he traveled overseas, took the drug in another country and was cured, would he be arrested if he returned? If he were my child, would I be willing to let him suffer horribly, knowing there was a cure available? I'm certain I would not, and I would rage against any law that compelled me to do so.

Concerned about what I might do, the White House asked me to come to a meeting. Karl Rove, President Bush's top political advisor, was there along with several other administration officials. Although I initially wondered whether this was the proverbial call to the woodshed, we instead had an interesting and forthright discussion about why I had decided to support stem cell research. While it was clear that the President and I had reached different conclusions, it was also clear that his staff had been struggling with many of the same issues as I had.

Shortly thereafter, I joined Senators Ted Kennedy, Dianne Feinstein of California, and Arlen Specter of Pennsylvania on a bill that would ban cloning aimed at producing a child but would permit the use of somatic cell nuclear transfer for research under limited and controlled circumstances. It has been endorsed by forty Nobel laureates, including some of the world's leading geneticists and cancer specialists.

As expected, the bill came under attack the minute it was introduced. Senator Brownback suggested that it would lead "to the creation of human embryo farms where embryos will be grown to specification." Others claimed it would lead to genetic manipulation and the creation of designer babies.

Of course, our legislation would specifically prohibit this kind of cloning, but the debate will continue through the election and over the coming years. Both sides are working on their respective bills, waiting for the Senate to vote. The bill I cosponsored will probably be amended to make it clear that it would apply only to unfertilized eggs; that both the eggs and

the stem cells would have to be voluntarily provided with no financial profiteering as a result of the donation; that in the case of somatic cell nuclear transfer, the artificially created cells could be used in their first fourteen days only; and research centers must be physically separate from an in vitro clinic where the eggs are donated. It would ensure that the study of regenerative medicine will be conducted largely in conjunction with American moral and ethical standards, instead of allowing another country, perhaps one having fundamentally different priorities and proprieties, to dictate the direction of the research. And it will ensure that many of our most brilliant scientists will not be pressured to move overseas to find cures to the most painful and debilitating diseases in the world.

No matter who wins this time, the issue will be back next year and for many years after that. When Congress reconvenes in January 2003, we will start all over again. There will be new debates over old problems. We again will talk about Social Security reform, taxes, prescription drug benefits and the budget. New issues will be discovered and new solutions revealed. We will be diverted by unforeseen events and sidetracked by incidents that are impossible to predict. Still, there will be time to revisit the more vexing problems from the previous year. Regenerative medicine will undoubtedly be on this list. It is far too complicated and controversial to be resolved by only one Congress.

I have little doubt about the outcome, however. It may be caused by a remarkable scientific discovery or breakthrough. It may be determined by a handful of dedicated, compelling individuals who have the courage and persistence to step forward and convince the country that the potential benefits far outweigh the potential dangers. Maybe it will be in reaction to a terrible mistake or revelations that researchers are engaging in the very kind of human cloning feared by most Americans. Or, we may learn that, despite earlier predictions, adult stem cells can be studied just as effectively as embryonic ones. In the end, however, we will reach a final decision because it reflects a consensus of what the American people believe and want.

The rhetoric will diminish, as it always does. Over time, as our collective knowledge grows, even the most vehement criticisms will be tempered, and we will learn that, despite our respective fears, many of our core principles were in fact not in jeopardy. This is the beauty and the frustration of our political system.