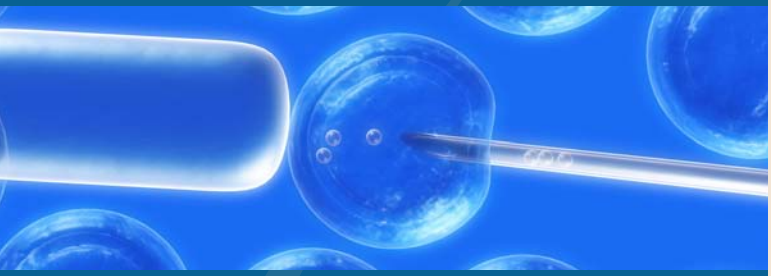
Human Cloning
and the Abuse of Science



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Tony Perkins

President
Family Research Council

HUMAN CLONING AND THE ABUSE OF SCIENCE
BY WILLIAM L. SAUNDERS, JR. AND DR. DAVID PRENTICE
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Human Cloning
and the Abuse of Science

Human cloning is a subject of international controversy–it is being debated on every continent and at the United Nations. In the United States, the question is being addressed at both the national and state levels. No matter the venue, however, clear and careful thinking is necessary. To make an informed decision about human cloning, we must understand what it is and what it entails. How we answer the question of human cloning has significance for the future of biotechnology, medicine, ethics, and human dignity.

In this pamphlet, the Family Research Council's Dr. David Prentice and William L. Saunders, JD, provide the clear and careful analysis that the subject merits. First, Dr. Prentice, FRC's senior fellow for life sciences, explains the precise science of the cloning process and evaluates the scientific claims for its potential medical use versus alternatives. Dr. Prentice demonstrates that there is no doubt that human cloning creates a new, living member of the human species. Next, Mr. Saunders, FRC's senior fellow for human life and bioethics, examines the ethical standards that apply to scientific research involving members of our species. He demonstrates that universally acknowledged ethical standards clearly prohibit the cloning of human beings.

The Family Research Council hopes that the reader will use this publication to learn the basic facts about human cloning and its ethical implications. We are confident that when the facts are carefully considered, it will be evident that any human cloning is an abuse of science.

WILLIAM L. SAUNDERS, JR. is Senior Fellow & Director of Family Research Council's Center for Human Life & Bioethics. A graduate of the Harvard Law School, he was featured in its inaugural Guide to Conservative Public Interest Law in 2004.

DR. DAVID PRENTICE is Senior Fellow for Life Sciences at Family Research Council. He was formerly Professor of Life Sciences at Indiana State University, and Adjunct Professor of Medical and Molecular Genetics for Indiana University School of Medicine.

The Science of Cloning

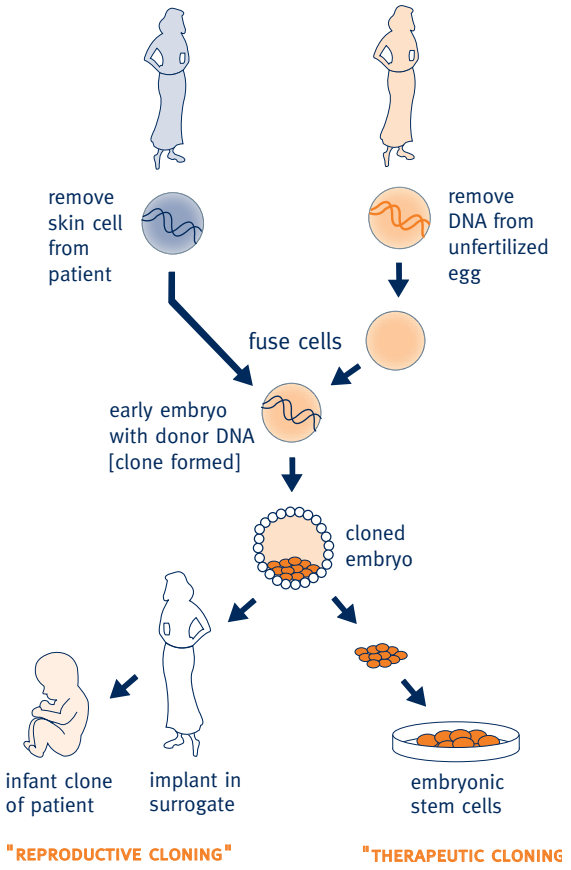
DAVID A. PRENTICE, PH.D.

Cloning always starts with an embryo. The most common technique proposed for human cloning is called somatic cell nuclear transfer (SCNT). This cloning is accomplished by transferring the nucleus from a human somatic (body) cell into an egg cell which has had its chromosomes removed or inactivated. SCNT produces a human embryo who is virtually genetically identical to an existing or previously existing human being.

Proponents of human cloning hold out two hopes for its use: (1) the creation of children for infertile couples (so-called "reproductive cloning"), and (2) the development of medical miracles to cure diseases by harvesting embryonic stem cells from the cloned embryos of patients (euphemistically termed 'therapeutic cloning").

Terminology

All human cloning is reproductive. It creates—reproduces—a new, developing human intended to be virtually identical to the cloned subject. Both "reproductive cloning" and 'therapeutic cloning" use exactly the same technique to create the clone, and the cloned embryos are indistinguishable. The process, as well as the product, is identical. The clone is created as a new, single-cell embryo and grown in the laboratory for a few days. Then it is either implanted in the womb of a surrogate mother ("reproductive cloning") or destroyed to harvest its embryonic stem cells for experiments ("therapeutic cloning"). It is the same embryo, used for different purposes. In fact, the cloned embryo at that stage of development cannot be distinguished under the microscope from an embryo created by fertilization joining egg and sperm. Trying to call a cloned embryo something other than an embryo is not accurate or scientific. Biologically and genetically speaking, what is created is a human being; its species is Homo sapiens. It is neither fish nor fowl, neither monkey nor cow—it is human. Even leading scientific



journals and embryonic stem cell scientists acknowledge that what is produced is a human embryo, and that trying to redefine "embryo" for purposes of SCNT[1] or define away the fact that SCNT produces an embryo is "disingenuous".[2]

Clones are Beset with Abnormalities

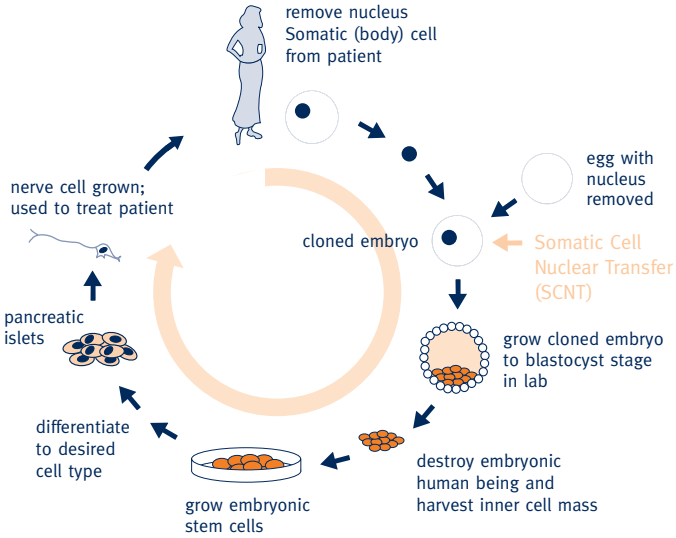
Cloning has an enormous failure rate—95 to 99 percent of clones die before or soon after birth. For example, out of 277 cloned embryos, only one sheep—Dolly—was produced, and even this "successful" clone had numerous abnormalities and finally had to be destroyed. The same rate of failure is seen in all mammals that have been cloned. We can expect that, of those few cloned humans who survive to birth, most will die shortly thereafter, and the others will be plagued by abnormalities. And because of the abnormalities inherent in cloning, the health of the surrogate mother carrying the clone is also endangered.

Created in Order to be Destroyed

"Therapeutic cloning" is obviously not therapeutic for the embryo. The new human is specifically created in order to be destroyed as a source of tissue: "[Therapeutic cloning] requires the deliberate creation and disaggregation of a human embryo."[3]

Most cloned embryos do not even survive one week, to the blastocyst stage, when they are destroyed in the process of harvesting their cells. Experiments with animals show that even these early embryos have abnormalities in genetic expression.

Theoretically, the embryonic stem cells from the cloned human embryo would be used to generate matched tissues for transplant into the patient from whom the embryo was cloned. But it is also a fact that there are no therapies currently available from therapeutic cloning, and none in the foreseeable future.[4]



However, the promises put forth for "therapeutic cloning" are not supported by the scientific literature. When the experiment was tried in mice, rather than producing matching tissues, the cloned cells were rejected:

> "Jaenisch addressed the possibility that ES clones derived by nuclear transfer technique could be used to correct genetic defects. . . . However, the donor cells, although derived from the animals with the same genetic background, are rejected by the hosts."[5]

Indeed, the only real success in the experiment was achieved by bringing cloned mice to birth and using the born-mouse bone marrow adult stem cells to treat the disease. Ironically, the similar genetic defect in humans, severe combined immunodeficiency syndrome ("boy in the bubble disease"), was cured in infants in 2000 using gene therapy with the infants' own bone marrow adult stem cells.[6]

Beyond the abnormalities caused by the cloning procedure, embryonic stem cells from cloned embryos will still face problems for their use, including the tendency to form tumors, and significant difficulties in getting the cells to form the correct tissue and function normally.

Adult Stem Cells: The Ethical Alternative

Human cloning is completely unnecessary for medical progress. Too often a false choice has been put forth—that we must either destroy embryos or allow patients to die. But there are other choices, particularly adult and umbilical cord stem cells. Those who say adult stem cells are not a valid alternative are quoting obsolete, outdated information. A wealth of scientific publications now documents that adult stem cells are a much more promising source of stem cells for regenerative medicine than embryonic stem cells. Some adult stem cells show the capacity to generate virtually all adult tissues. Most, if not all, tissues contain stem cells that can be isolated and grown in culture, providing sufficient numbers for clinical treatments. Adult stem cells have effectively treated numerous diseases in animal experiments, including diabetes, stroke, ALS, Parkinson's, heart damage, kidney damage, spinal cord injury, and retinal degeneration.[7]

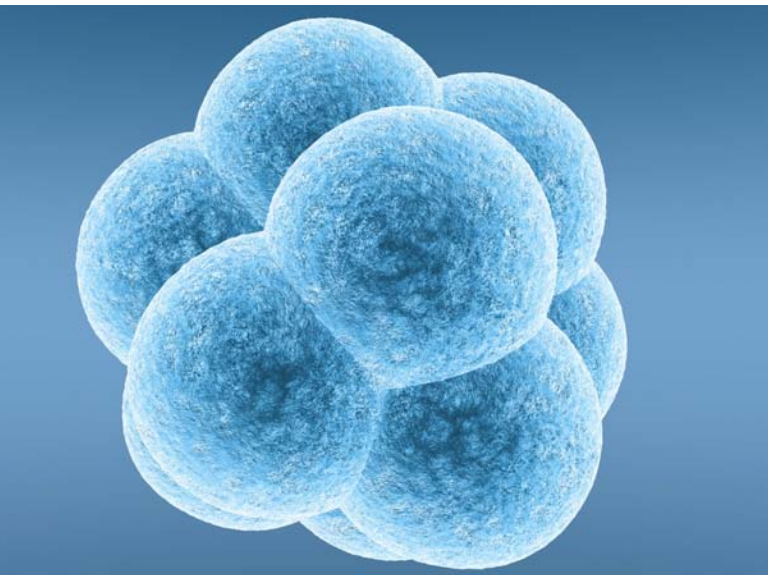
Moreover, human patients are already benefiting from the use of adult stem cells in treatments for more than seventy diseases, including multiple sclerosis, lupus, arthritis, various cancers, anemias including sickle cell anemia, spinal cord injury, heart damage, and juvenile diabetes.[8] These are real treatments for real patients. Adult stem cells are being used to form new cartilage and ligaments

so that people can walk, to grow new corneas to restore sight to blind patients, to treat stroke patients, and to repair damage after heart attacks. Adult stem cells have successfully alleviated the symptoms of Parkinson's disease and allowed spinal cord injury patients to walk again with the aid of braces. The patient's own adult stem cells can be used for these treatments, thereby avoiding immune rejection and tumor formation-problems which plague embryonic stem cell research.

Human Cloning Poses Health Risks to Women

Cloning is a tremendously inefficient process, and an enormous supply of human eggs will be needed to create even a few cloned human embryos. The most optimistic estimates are that it will require at least 50-100 human eggs to produce just one cloned embryo.[9] A simple calculation reveals that treating just one patient group, the 17 million diabetes patients in the United States, will require at least 850 million to 1.7 billion human eggs. Approximately 85 million women of childbearing age would have to "donate" eggs. This will subject a large number of women to health risks due to the high hormone doses and surgery that they will undergo. The result will be that human eggs will become a commodity and

disadvantaged women will be exploited on a global scale. Cloning research has produced one of the biggest frauds in scientific history—Dr. Hwang's publication of supposedly successful cloning of human embryos and isolation of embryonic stem cells from the destroyed clones. Hwang's fraud



was finally exposed,[10] but not before over 100 women donated eggs for the experiments, many of whom experienced health problems from the egg extractions.

Theraputic Cloning Leads to Reproductive Cloning

Because there is no difference in the nuclear transfer technique or the cloned embryo, allowing "therapeutic cloning" experimentation to proceed will inevitably lead to "reproductive cloning." The technique can be practiced and huge numbers of cloned embryos produced.

Proposals even include creating human-animal hybrid clones for experiments and to practice the cloning technique.[11] Despite previous statements condemning the idea of "reproductive cloning", some scientists are now saying that it would be okay to produce born cloned children.[12] The slippery slope is indeed a reality when it comes to cloning, with no limits foreseen or desired by the scientists involved.

Human cloning is unsafe and unnecessary. There are no valid or compelling grounds—scientific or medical—to proceed. A comprehensive ban on all human cloning is the only sufficient answer.

Dr. David A. Prentice is Senior Fellow for Life Sciences at Family Research Council. He joined FRC after almost 20 years as Professor of Life Sciences at Indiana State University and Adjunct Professor of Medical and Molecular Genetics, Indiana University School of Medicine. Pearson Education/Benjamin Cummings recently published his first book, Stem Cells and Cloning.

The Abuse of Science

WILLIAM L. SAUNDERS, JD

As Dr. Prentice has shown, cloning indisputably destroys innocent human life. This basic truth should lead the world to reject human cloning. However, in an effort to extricate human cloning from this ethical vise grip, its supporters attempt to draw a distinction between human life, which begins at conception, and human "personhood," which begins only at their say-so.

Unfortunately, the arbitrary denial of "personhood" to human beings has a long and cruel history. The Nuremberg Code, formulated in the years after World War II, is particularly instructive with regard to the current debate on human cloning. For instance, when the principal author of the report on human cloning issued by the National Academy of Sciences testified before the President's Council on Bioethics, he stated that "reproductive cloning" would violate the Nuremberg Code: "The Nuremberg Code, with which I am in full agreement, outlines those kinds of things you would not simply [do] for the sake of knowledge that involve human subjects."[13]

The Nuremberg Code is a body of ethical norms enunciated by the Nuremberg Tribunal, which, after World War II, had the responsibility of judging the actions of the Nazis and their allies. The point of the code was to restate and apply the established ethical norms of the civilized world.

Nazi laws had defined Jews and other "undesirables" as non-persons. Eventually, between six and nine million of these "undesirables" were sent to extermination camps and killed. However, before

the killing in the camps began, the Nazis had engaged in an extensive campaign of euthanasia against the mentally and physically handicapped, which not only foreshadowed but also prepared the way for the extermination camps. In his book *The Nazi Doctors*, Robert Jay Lifton draws our attention to a book titled *The Permission to Destroy Life Unworthy of Life,* written during the campaign. Lifton writes:

> [It was] published in 1920 and written jointly by two ... German professors: the jurist Karl Binding ... and Alfred Hoche, professor of psychiatry at the University of Freiburg. Carefully argued in the numbered-paragraph form of the traditional philosophical treatise, the book included as "unworthy life" not only the incurably ill but large segments of the mentally ill, the feebleminded, and retarded and deformed children. ... [T]he authors professionalized and medicalized the entire concept; destroying life unworthy of life was "purely a healing treatment" and a "healing" work.[14]

The Nazis were determined to "cleanse" the genetic pool to produce "better" Aryans. Nazi

officials announced that "under the direction of specialists ... all therapeutic possibilities will be administered according to the latest scientific knowledge."[15] The result of this therapeutic treatment of "inferior" lives was that "eventually a network of some thirty killing areas within existing institutions was set up throughout Germany and in Austria and Poland."[16] In their book, The Nazi Doctors and The Nuremberg Code, George Annas and Michael Grodin reveal that:

> At the same time that forced sterilization and abortion were instituted for individuals of "inferior" genetic stock, sterilization and abortion for healthy German women were declared illegal and punishable (in some cases by death) as a "crime against the German body." As one might imagine, Jews and others deemed racially suspect were exempted from these restrictions. On November 10, 1938, a Luneberg court legalized abortion for Jews. A decree of June 23, 1943, allowed for abortions for Polish workers, but only if they were not judged "racially valuable."[17]

Later, the Nazis created the extermination camps for the Jews and other "inferior" races. In the camps, Nazi doctors engaged in cruel experiments on the Jews, Gypsies, Poles, and others. They exposed them to extreme cold to determine the temperature at which death would occur. They injected them with poisons to see how quickly certain lethal elements moved through the circulatory system. They subjected twins to all manner of disabling and brutal experiments to determine how genetically identical persons reacted to different conditions.

Some of the experiments were nonetheless designed to preserve life—not of the subject, but of, for example, German pilots who were forced to parachute into freezing ocean waters.

Everyone agrees the Nuremberg Code prohibits "reproductive cloning." What relevance does it have for "therapeutic cloning"? If human embryos are human beings, then "therapeutic cloning," which creates an embryo only to destroy it in the process of exploiting its stem cells, violates a cardinal principle of the Nuremberg Code: There is to be no experimentation on a human subject when it is known that death or disabling injury will result.[18] Regardless of the good that might be produced by such experiments, the experiments are of their very nature an immoral use of human beings.

The Debate over the Status of the Human Embryo

Human life begins in one of two ways: either in the normal, sexual way—when a female oocyte, or egg, is fertilized by a mate sperm cell—or, as with cloning, asexually—when the nucleus of an oocyte is removed and is replaced with a nucleus from another cell, after which an electrical stimulus is applied.[19] In either case, from that moment forward there is a new human organism. It is genetically complete. From the first moment, the new single-cell organism directs its own integral functioning and development. It will proceed through every stage of human development until

one day, it looks like we do. To illustrate, simply think of photographs from your own infancy—you don't look like that today!

Your appearance has changed, but you are still the same person. Change is the very essence of life. As Dr. John Harvey from the Georgetown Medical School's Center for Clinical Bioethics observed, "A human being is unchangeable and complete only at the moment of death!"[20]

The embryo will grow and develop, and it will change. But it will undergo no change in its nature. In other words, there is no chance it will grow up to become a cow or a fish. It is a living human being—its nature is determined—from the first moment of its existence.[21] As the respected ethicist Paul Ramsey said, "The embryo's subsequent development may be described as a process of becoming what he already is from the moment of conception."[22]

Guarding Ourselves against Committing 'Inhuman Acts'

Recall how the Nazis subverted the meaning of healing. Recall how they used the term "therapeutic" to describe not the helping of suffering people, but the killing of them. Recall that the Nazis eliminated those "unworthy of life" in order to improve the genetic stock of Germany. Recall how the Nazis undertook lethal experiments on concentration camp inmates in order, in some cases, to find ways to preserve the lives of others.

The point is not to suggest that those who support "therapeutic cloning" are, in any sense, Nazis. Rather, the point is to cause each of us to think deeply about whether there is any essential difference between the reality of those Nazi experiments and "therapeutic cloning." As we have shown, each case involves a living human being, and that human being is killed in the aim of a perceived "higher" good.

Cloning proponents try to distinguish between the two cases by saying that the cloned human being has no "potential." But in each case, it is the actions of other human beings that rob the first of "potential" (in the first case, the actions of Nazi executioners; in the second, the laboratory technicians). In either case, the human subject is full of potential simply by being a living human being. Of course, almost miraculously, many of the inmates of the camps did survive when the allies rescued them. Equally miraculously, frozen embryos have been implanted in a woman's womb and brought to live (and healthy) birth.[23]

As we have shown, every embryo is not merely "potentially" a life, but actual life, a human being from the first moment of existence. Furthermore, any living human embryo has the inherent "potential" to develop into a healthy baby. It is disingenuous for supporters of cloning to claim the cloned human embryo is only "potential life" because they plan to mandate by law that it be destroyed before it can come to birth. Regardless of its location, the human embryo, by its nature, is full of potential, unless the actions of adult human beings deprive it of the opportunity to realize that potential.

Alexander Solzhenitsyn, a man who chronicled and suffered under another ideology that denied the dignity of each and every human being, observed, "Gradually it was disclosed to me that the line separating good and evil passes not through states, nor between classes, nor between political parties either, but right though every human heart, and through all human hearts. This line shifts. Inside us, it oscillates."[24]

Solzhenitsyn did not regard the perpetrators of brutal crimes in his own country as inhuman monsters. Rather, he saw the essential truth—they were human beings, engaged in immoral acts. They engaged in those acts by dehumanizing the persons on whom their brutality was inflicted, and they did so in the name of (perhaps in the passionate belief in) a greater good. But Solzhenitsyn reminds us that, unless we are willing to admit that, for the best as well as for the worst of motives, we are also capable of inhuman acts, we will have no guard against committing them. No one is safe from brutality so long as we think that it is only inhuman others who are capable of inhuman acts. Rather, we will be secure when we are willing to look honestly at the objective reality of our acts, while realizing that we, too, are capable of acts that violate the inherent dignity of

another, and refuse to engage in such acts despite the good we believe would result from those acts. In the debate over the cloning and destruction of embryonic human beings, this essential truth must be our guide.

William L. Saunders, JD, is Senior Fellow and Director of the Center for Human Life and Bioethics at the Family Research Council. A graduate of Harvard Law School, he has written widely on bioethics and human dignity. Most recently, he authored "The Human Embryo in Debate," a chapter in Human Dignity in the Biotech Century, *published by InterVarsity Press.*

FOOTNOTES

1. Editorial, "Playing the name game," *Nature* 436 (2005) 2

2. A. Boyle, "Stem cell pioneer does a reality check: James Thomson reflects on science and morality," MSNBC, June 22, 2005

3. R.P. Lanza, A.L. Caplan, L.M. Silver, J.B. Cibelli, M.D. West, R.M. Green, "The ethical validity of using nuclear transfer in human transplantation," *Journal of the American Medical Association* 284 (2000) 3175-3179.

4. D. Magnus and M.K. Cho, "Issues in oocyte donation for stem cell research," *Science* 308 (2005) 1747-1748

5. R.Y.L. Tsai, et al., "Plasticity, niches, and the use of stem cells," *Developmental Cell* 2 (2002) 707-712.

6. M. Cavazzana-Calvo, et al., "Gene therapy of human severe combined immunodeficiency (SCID)Xl disease"; *Science* 288 (2000) 669-672.

7. D. Prentice, "Adult Stem Cells." Appendix K in *Monitoring Stem Cell Research: A Report of the President's Council on Bioethics*, 309-346, (Washington, D.C.: Government Printing Office, 2004). Available at http://bloethics.gov/reports/stemcell/appendix-k.html

8. D.A. Prentice and G. Tarne, "Treating Diseases with Adult Stem Cells," *Science* 315 (2007) 328; D.A. Prentice and G. Tarne, "Adult versus embryonic stem cells: Treatments," *Science* 316 (2007) 1422-1423; D.A. Prentice, "Current science of regenerative medicine with stem cells," *Journal of Investigative Medicine* 54 (2006) 33-37; see also National Marrow Donor Program, http//www.marrow.org and Do No Harm, http://stemcellresearch.org

9. D. A. Prentice, *Stem Cells and Cloning*, 1st edition, M. A. Palladino, series ed., (San Francisco: Pearson Education/Benjamin-Cummings, 2002); see also, Mombaerts P, "Therapeutic cloning in the mouse," *Proceedings of the National Academy of Sciences* USA 100, Sept. 30, 2003: 11924-5.

10. J. Couzin, "Breakdown of the year: Scientific fraud," *Science* 314 (2006) 1853

11. I. Sample, "Scientists call for right to use animal/human embryos," *The Guardian,* June 18, 2007.

12. "Backing for baby cloning to beat disease," *Daily Telegraph*, June 5, 2006

13. From the third meeting of the President's Council on Bioethics, April 13, 2002, available at: www.bioethics.gov/meetings/200202/0213.html.

14. R. J. Lifton, *The Nazi Doctors: Medical Killing and the Psychology of Genocide* (New York: Basic Books, 1986): 46.

15. Ibid., 54.

16. Ibid., 54.

17. G. J. Annas and M. A. Grodin, *The Nazi Doctors and The Nuremberg Code* (Oxford University Press, 1992): 22.

18. Nuremberg Code, Article 5.

19. The cloning procedure supplies the oocyte with a complete set of chromosomes, all of which are contained in the nucleus which is transferred into the denucleated oocyte. With sexual reproduction, half of the chromosomes are supplied by the sperm and half by the oocyte.

20. J. C. Harvey, "Distinctly Human: The When, Where, and How of Life's Beginnings," *Insight* 244 (Washington, D.C.: Family Research Council, 2002): 6.

21. In R. P. George, "The Ethics of Embryonic Stem Cell Research and Human Cloning," *At the Podium* 87 (Washington, D.C.: Family Research Council, 2002). Professor George offers a cogent critique of

all arguments against the personhood of the embryo, including the view that the human embryo prior to possessing a brain is not a person.

22. P. Ramsey, *Fabricated Man: The Ethics of Genetic Control* (New Haven: Yale University Press, 1970): 11.

23. See, e.g., M. Charen, "Another Kind of Adoption," *Jewish World Review*, Feb. 28, 2001, available at: http://www.jewishworldreview.com/cols charen022801.asp

24. Available at: http://www.spartacus.schoolnet.co.uk/ russolzhenitsyn.htm

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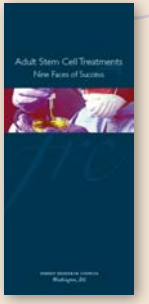

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