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International Response to Dolly: Will Scientific Freedom Get Sheared

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INTERNATIONAL RESPONSE TO DOLLY: WILL SCIENTIFIC FREEDOM GET SHEARED?

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"Freedom is the oxygen without which science cannot breathe."

—David Sarnoff, Chairman of RCA¹

I. INTRODUCTION

On February 22, 1997, the researchers at the Roslin Institute in Edinburgh shocked the scientific community as well as the world by unveiling the first clone of an adult animal from differentiated cell.² Their seven-month old sheep, Dolly, was created from an adult mammary gland cell.³ Although successful nuclear transplantation ("cloning") was first reported in 1952, all of the experiments involved undifferentiated embryonic cells.⁴ Scientists considered it impossible to use the same techniques on differentiated cells from an adult animal.⁵ After many failed experiments, a generation of researchers believed that differentiated animal cells could not be reprogrammed to develop into a new animal.⁶ Dr. Ian Wilmut, leader of the Roslin research team, and his colleagues proved conventional wisdom wrong.

¹Emily Davie, *Electronics—Today and Tomorrow*, PROFILE OF AMERICA, (New York Crowell, 1954).

²*British Scientists Claim First Clone of Adult Animal*, THE REUTER EUROPEAN BUSINESS REPORT, Feb. 22, 1997 [hereinafter *British Scientists*]

³Ian Helmut, et al., *Viable Offspring Derived from Fetal and Adult Mammalian Cells*, NATURE, Feb. 27, 1997, at 810.

⁴Pizzulli, *Asexual Reproduction and Genetic Engineering: A Constitutional Assessment of the Technology of Cloning*, 47 S. CAL. L. REV. 476, 477 (1974) (implanting the nucleus of an undifferentiated embryonic cell into a cell where the nucleus has been removed).

⁵See *British Scientists*, *supra* note 2.

⁶Tim Beardsley, *The Start of Something Big? Dolly Has Become a New Icon for Science*,

The theory behind Dr. Wilmut's technique is that all body cells contain the exact same genetic information as the initial fertilized egg cell (or embryo).⁷ As an embryo develops, parts of the genetic message "switch off" through the process of differentiation.⁸ This causes the cell to become a specific tissue or organ (the cell is now considered to be differentiated).⁹ Dr. Wilmut's trick was to make the DNA of the differentiated donor cell act like the DNA of a sperm or unfertilized egg.¹⁰ He and his team "starved" the mammary cell into a dormant stage by reducing the nutrient-laden serum to the cell,¹¹ which made it capable of duplicating the entire organism (like an undifferentiated cell).¹² An electrical current was then administered which caused the "starved" mammary cell to fuse, in a process called renucleation, with an unfertilized egg from which the nucleus had previously been removed through enucleation.¹³ The resulting embryo was then implanted into a surrogate mother and brought to term.¹⁴ Dolly became an exact genetic duplicate (a clone, or twin) of the mammary cell donor.¹⁵ However, her long-term health is still an uncertainty because her cells may act like the cells of a sheep six years older—the age difference between Dolly and her mother.¹⁶

When asked about the applications of this new technology, Dr. Wilmut told Britain's Press Association news agency it would be used "to produce more health care products. It will enable us to study genetic diseases for which there is presently no cure and track down the mechanisms that are involved."¹⁷

SCIENTIFIC AMERICAN, Vol. 276, No. 5, May 1997, at 15.

⁷See Pizzulli, *supra* note 4, at 477.

⁸See *id.*

⁹See *id.*

¹⁰Elizabeth Pennisi & Nigel Williams, *Will Dolly Send in the Clones? The First Mammalian Clone, Produced from an Adult Sheep, Took the World by Storm, but Leaves a Rash of Unanswered Scientific Questions in her Wake*, Mar. 7, 1997, at 1415.

¹¹See *id.*

¹²See Pizzulli, *supra* note 4, at 477.

¹³Pennisi & Williams, *supra* note 10, at 1415; *Cloning - Challenges for Public Safety: Hearing Before the Subcomm. on Public Health and Safety of the Senate Comm. on Labor and Human Resources*, 105th Cong. (Mar. 12, 1997) (statement of Karen H. Rothenberg, J.D., M.P.A.), available in 1997 WL 119635 (F.D.C.H.).

¹⁴*Cloning - Challenges for Public Safety: Hearing on S. 368 Before the Subcomm. on Public Health and Safety of the Senate Comm. on Labor and Human Resources*, 105th Cong. (Mar. 12, 1997) (statement of Karen H. Rothenberg, J.D., M.P.A., Professor of Law, University of Maryland School of Law), available in 1997 WL 119635 (F.D.C.H.) [hereinafter *Cloning-Challenges Hearing on S. 368*].

¹⁵See *id.*

¹⁶See Beardsley, *supra* note 6, at 16.

¹⁷See *British Scientists*, *supra* note 2.

Cloning technology, in general, holds the promise of tremendous benefits in agriculture and medicine,¹⁸ and could help save endangered species such as the Hairy Nosed Wombat and China's Giant Panda.¹⁹ Medical advances include "revolutionary medical treatments and life-saving cures for diseases such as cancer, hemophilia, cystic fibrosis, sickle cell anemia, and emphysema."²⁰ It can also further understanding of developmental biology and allow physicians to repair and regenerate human tissue in burn victims and those suffering from spinal cord injuries.²¹

One medical application relates to tissue and organ transplants.²² There is a greater medical need of transplantable organs than is currently available from any source.²³ It is possible using cloning techniques to grow a replacement organ with the same genetic make-up of the patient to receive it.²⁴ If organs are derived from the person in whom they will ultimately be transplanted, immune rejections of the implant would be prevented.²⁵

Although scientists have been able to clone animals since the 1950's, Dolly represents two important breakthroughs. Scientifically, she proves that differentiated cells can be "turned back on" and induced to grow into a complete animal.²⁶ Douglas Foster, an animal science professor at the University of Minnesota, said the event was "mind-boggling because everybody thought you

¹⁸H.R. REP. NO. 105-239, pt. 17, (1997) (statement by Mrs. Morella, the Subcommittee Chair).

¹⁹*Cloning Could Save Endangered Species Like Hairy Nosed Wombat*, AGENCE FRANCE PRESSE (London), Sept. 10, 1997; Mark Burleigh, *The Baa that Signaled Science's Entry into the 21st Century*, AGENCE FRANCE PRESSE (London), Dec. 24, 1997 (citing Zoologist Chen Dayuan of Beijing's Institute of Zoology); see also *Panda Cloning Raises Debate in China*, AGENCE FRANCE PRESSE, Oct. 31, 1997 (arguing that cloning could negatively affect the Panda's genetic pool).

²⁰See H.R. REP. NO. 105-239, *supra* note 18.

²¹*Human Cloning: Hearing on the Review of the Recommendations on Cloning by the President's Commission Before the Subcomm. on Technology of the House Comm. on Science*, 105th Cong. (June 12, 1997) (statement of Constance A. Morella, Chairwoman, Technology Subcommittee), available in 1997 WL 325638 (F.D.C.H.).

²²*Ethics and Theology-A Continuation of the National Discussion on Human Cloning: Hearing Before the Subcomm. on Public Health and Safety of the Senate Comm. on Labor and Human Resources*, 105th Cong. [hereinafter *Ethics & Theology*] (June 17, 1997) (statement of John A. Robertson, J.D., Professor, University of Texas School of Law), available in 1997 WL 329510 (F.D.C.H.).

²³Seymour Lederberg, *Law and Cloning-The State as Regulator of Gene Function*, GENETICS AND THE LAW 377, 379 (Aubrey Milunsky & George J. Annas eds., Plenum Press 1975).

²⁴*British Tinkering with Tadpoles Opens Way to Headless Humans*, AGENCE FRANCE PRESSE (London) Oct. 19, 1997 [hereinafter *British Tinkering*].

²⁵See *id.*

²⁶Sharon Schmickle, *Scientists Trot Out Cloned Calf: Research is Step Toward Super Cattle*, NEW MEDICINE, STAR TRIB. (MINNEAPOLIS-ST. PAUL), Aug. 8, 1997, at A1.

could never de-differentiate cells."²⁷ Ethically, Dolly represents the possibility of asexual human reproduction—a woman could reproduce without the involvement of a man. "She merely provides her own DNA, her own unfertilized egg, and her own womb."²⁸

Dolly's entrance onto the world stage re-ignited an on-going global debate regarding the ethics of genetic research, and in particular, the cloning of a human. In the United States, President Clinton charged the National Bioethics Advisory Commission to report back to him in ninety days about the moral, scientific, and ethical ramifications of cloning a human being.²⁹ On the same day, the Foundation of Economic Trends said that it had organized 400 religious and health organizations worldwide to push for new laws banning human cloning.³⁰ Three bills were introduced in Congress regarding this issue (S. 368 on 2/27/97, and H.R. 922 and 923 on 3/4/97),³¹ and the President proposed his legislation on June 9, 1997.³² As of August 1997, at least thirteen states have also drafted bills to prohibit human cloning.³³

Internationally, the Vatican was one of the first to take a public stand on the issue arguing that people have a right to be born in a human way and not in a laboratory.³⁴ An emergency debate in the European Parliament on March 11, 1997 generated support for a formal Europe-wide prohibition.³⁵ Many other countries followed suit and banned or introduced legislation to ban human cloning (i.e. Malaysia, China, Japan, etc.).³⁶ The World Medical Association, the World Health Organization, and UNESCO were among many international

²⁷See *id.*

²⁸Stephen A. Newman, *Human Cloning and the Family: Reflections on Cloning Existing Children*, 13 N.Y.L. SCH. J. HUM. RTS. 523, 524 (1997).

²⁹*Clinton Seeks Legal, Ethics Review of Issues Related to Human Cloning*, HEALTH CARE DAILY (BNA), Feb. 25, 1997, at D-8 [hereinafter *Clinton Seeks*].

³⁰Margaret A. Jacobs, *Cloning Faces Few Legal Barriers, But Ethical and Patent Questions*, WALL ST. J., Feb. 25, 1997, at B8.

³¹Eliot Marshall, *Mammalian Cloning Debate Heats Up*, SCIENCE, Mar. 21, 1997, at 1733.

³²*President Clinton Proposes Legislation to Impose Five-Year Ban on Human Cloning*, HEALTH CARE DAILY (BNA), June 10, 1997, at D4 [hereinafter *President Clinton*].

³³*Language of Privacy, Cloning Bills Threaten Genetic Research, PhRMA Says*, HEALTH CARE DAILY (BNA), Aug. 7, 1997, at D-4 [hereinafter *Language of Privacy*].

³⁴*Vatican Panel Condemns Cloning*, TULSA WORLD, Mar. 4, 1998, at 5, available in 1998 WL 11128576.

³⁵*Emergency Debate - Support for Europe-Wide—and Worldwide—Ban on Human Cloning*, THE LANCET, Mar. 15, 1997.

³⁶Kuala Lumpur, *Malaysia Bans Human Cloning*, DEUTSCHE PRESSE-AGENTUR, Mar. 18, 1997; *China Bans Human Cloning*, DEUTSCHE PRESSE-AGENTUR, May 13, 1997 [hereinafter *China Bans I*]; *Government Committee Reports on Clone Research*, COMLINE DAILY NEWS BIOTECHNOLOGY & MED., June 6, 1997 [hereinafter *Government Committee Reports*] (citing JAPAN INDUSTRIAL JOURNAL, May 30, 1997, at 27).

organizations who also condemned the practice.³⁷ The issue was even addressed at the Summit of the Eight held in Denver, CO in June.³⁸

With all the international attention this little sheep has generated, many scientists, lawyers, and members of the pharmaceutical industry are concerned that important research will be thwarted, and life-saving medical breakthroughs frustrated by ill-conceived laws.³⁹ Although there is no mention in the U.S. Constitution or in U.S. case law of a specific right to freedom of scientific inquiry, the First Amendment free speech clause and the Fourteenth Amendment due process clause support this concept.⁴⁰ Justice McReynolds stated in *Meyer v. State of Nebraska* that "[t]he American people have always regarded education and acquisition of knowledge as matters of supreme importance which should be diligently promoted."⁴¹

Internationally, the law is even murkier. The UN adopted the Universal Declaration of Human Rights which affirms the fundamental rights to life, liberty, medical care, and to benefit from scientific progress and its uses, yet prohibits human cloning.⁴² Several countries, including France, Denmark, and the Netherlands, forbid embryo research, and Germany and Spain have complete bans against human cloning.⁴³

As the world attempts to harness this new technology for the benefit of all people, careful attention must be paid to the concept of scientific freedom. Historical figures such as Galileo remind us of the tragedy of encumbered scientific inquiry,⁴⁴ while Nazi doctors are a glaring example of medical re-

³⁷*Cloning of Human's Not Acceptable, Says WHO*, CHINA DAILY, May 16, 1997, at 4, available in 1997 WL 8259607.

³⁸G8 Take Tough Stand on Reproductive Cloning, DENVER (DTNS), June 23, 1997 [hereinafter G8] (the Summit of Eight was an international gathering of the G7, the seven largest industrialized nations in the world, and Russia).

³⁹*Cloning - Challenges for Public Safety: Hearing on S. 368 Before the Subcomm. on Public Health and Safety of the Senate Comm. on Labor and Human Resources*, 105th Cong. (Mar. 12, 1997) [hereinafter *Cloning-Challenges*] (statement of James A. Geraghty, President and CEO of Genzyme Transgenics Corporation, available in 1997 WL 119712 (F.D.C.H.)).

⁴⁰IRA H. CARMEN, CLONING AND THE CONSTITUTION: AN INQUIRY INTO GOVERNMENTAL POLICYMAKING AND GENETIC EXPERIMENTATION, 34 (1985).

⁴¹*Meyer v. Nebraska*, 262 U.S. 390, 400 (1923).

⁴²Mike Pezzella, *International Officials Adopt Rules Covering Cloning, Gene Research*, BIOTECHNOLOGY NEWSWATCH, Nov. 17, 1997, at 1.

⁴³*European Union Agrees with U.S. Human Cloning Should Be Banned*, TRANSPLANT NEWS, June 30, 1997 [hereinafter *European Union Agrees*]; Elizabeth Ann Pitrolo, *The Birds, the Bees, and the Deep Freeze: Is There International Consensus in the Debate over Assisted Reproductive Technologies*, 19 Hous. J. INT'L L. 147, 196 (1996).

⁴⁴Arthur G. Steinberg, *The Social Control of Science*, GENETICS AND THE LAW 301 (Aubrey Milunsky & George J. Annas eds., Plenum Press 1975) (Galileo was persecuted by the Church for his adherence to Copernicus' theory that the earth revolved around the sun).

search gone awry.⁴⁵ Medical advances in this century such as heart transplants and in-vitro fertilization were also greeted with the fear and trepidation that cloning received, but thankfully for the millions of lives that have been created or saved, the world did not ban these procedures.⁴⁶

This Comment will discuss the current threat to scientific freedom posed by absolute bans on human cloning. Parts II and III discuss the response of the United States and the international community to Dolly. Part IV discusses the legal position of scientific freedom in the U.S. and abroad. Finally, Part V will posit that a total ban on human cloning infringes on the freedom of scientific inquiry, and endangers the public by encouraging the establishment of black market cloning clinics.⁴⁷

II. THE UNITED STATES' RESPONSE

On February 22, 1997, British scientists at the Roslin Institute made the international announcement of Dolly's birth.⁴⁸ Two days later, President Clinton requested Dr. Harold T. Shapiro, chairman of the National Bioethics Advisory Commission and president of Princeton University to have the commission undertake a ninety day, thorough review of human cloning and recommend ways to prevent abuse of the technology.⁴⁹ The eighteen member panel was composed of expert scientists, theologians, and lawyers.⁵⁰

The science journal *Nature* published Ian Helmut's results on February 27, 1997.⁵¹ On that same day Senator Christopher (Kit) Bond (R-Mo.) introduced S. 368 which would permanently ban federal funding for human cloning research.⁵² It was his intent to make sure that human cloning stays in the realm of science fiction.⁵³ He wanted to send a clear signal that "human cloning is something we cannot and should not tolerate[.]" noting that the notion of cloning a human is repugnant to the public.⁵⁴ However, he narrowly drafted

⁴⁵ROBERT J. LIFTON, *THE NAZI DOCTORS* (1986).

⁴⁶*Cloning - Challenges for Public Safety: Hearing on S. 368 Before the Subcomm. on Public Health and Safety of the Senate Comm. on Labor and Human Resources*, 105th Cong. (Mar. 12, 1997) (statement of Senator Bill Frist), available in 1997 WL 117618 (F.D.C.H.)

⁴⁷See *infra* notes 334-338.

⁴⁸See *British Scientists*, *supra* note 2.

⁴⁹See *Clinton Seeks*, *supra* note 29.

⁵⁰Michele Grygotis, *Following Bioethics Advisory Committee Recommendations, President Clinton Calls for Ban on Human Cloning While Allowing Some Research to Proceed*, *TRANSPLANT NEWS*, June 30, 1997.

⁵¹See Helmut, et al. *supra* note 3.

⁵²143 CONG. REC. S1734-02, at 1734 (daily ed. Feb. 27, 1997) (statement of Sen. Bond introducing research legislation).

⁵³See *id.*

⁵⁴See *id.* at 1734-35.

the bill so it would not affect plant and animal cloning research or the mapping of the human genome.⁵⁵

A CNN/Time poll released on March 10, 1997 confirmed Sen. Bond's statement regarding the feelings of the public.⁵⁶ Based on interviews with 1,005 adult Americans, most thought cloning animals or humans was morally unacceptable—seventy-four percent said human cloning is against God's will.⁵⁷ When asked if they would consider cloning themselves, ninety-one percent said no.⁵⁸

A week after his request that the National Bioethics Advisory Commission review this technology, Clinton issued a memorandum entitled "Prohibition on Federal Funding for Cloning of Human Beings."⁵⁹ In the memorandum, he made clear that because of the profound ethical issues this technology raises, no federal funds would be allocated for human cloning.⁶⁰ In his announcement to reporters about the prohibition, Clinton compared this discovery to the splitting of the atom.⁶¹ Although this technology promises more productive strains of crops and livestock, revolutionary medical treatments and cures, and secrets of the genetic code, it carries burdens as well as benefits.⁶² He urged the entire scientific and medical community to follow the Federal government's example and establish a voluntary moratorium on the cloning of humans.⁶³ Later that afternoon, Rep. Vern Ehlers (R-Mich.) stated on the House floor that he will be introducing two bills in the House—one that will ban the use of federal funds for human cloning research, and a second to ban the practice of human cloning in the United States.⁶⁴ On March 5, 1997, Rep. Ehlers introduced

⁵⁵ See *id.* at 1735 (the human genome mapping project has already identified the genes that cause many devastating illnesses and is providing hope for cures).

⁵⁶ Jeffrey Kluger, *Will We Follow the Sheep? It Will Be Up to Science to Determine if Human Cloning Can Be Done. It is Up to the Rest of Us to Determine if it Should Be*, TIME, Mar. 10, 1997, at 66 (citing a telephone poll for TIME/CNN of 1,005 adult Americans taken on Feb. 26-27, 1997 by Yankelovich Partners, Inc.).

⁵⁷ See *id.*

⁵⁸ See *id.* (As of December 1997, opinion polls still showed that ninety-one percent of Americans disapprove of human cloning.) Cally Law, *I'm Gonna Live Forever*, SUNDAY TIMES, Dec. 21, 1997.

⁵⁹ Memorandum on the Prohibition on Federal Funding for Cloning of Human Beings, 33 WEEKLY COMP. PRES. DOC. 281 (Mar. 4, 1997).

⁶⁰ See *id.*

⁶¹ Remarks Announcing the Prohibition on Federal Funding for Cloning of Human Beings and an Exchange With Reporters, 33 WEEKLY COMP. PRES. DOC. 278 (Mar. 4, 1997) (speaking at 9:25am in the Oval Office at the White House).

⁶² See *id.*

⁶³ See *id.*

⁶⁴ 143 CONG. REC. H713-02, at H714 (daily ed. Mar. 4, 1997) (statement by Rep. Ehlers).

H.R. 922, The Human Cloning Research Prohibition Act, which was referred to the Committee on Science and the Committee on Commerce.⁶⁵

One week later, on March 12, the Senate Committee on Labor and Human Resources' Subcommittee on Public Health and Safety held a hearing on S. 368 entitled "Scientific Discoveries and Cloning: Challenges for Public Policy."⁶⁶ Sen. Bond testified that his intent with this bill was to send a message that human cloning was not to be tolerated.⁶⁷ He stated, "[t]his type of research on humans is morally reprehensible, and we should not be creating human beings for spare parts, as replacements, or for other unnatural and selfish purposes."⁶⁸ He questioned whether we should institute criminal penalties for conducting this type of research like Germany, Spain, and Australia have done.⁶⁹

Sen. Bill Frist, chair of the Subcommittee on Public Health and Safety and the only physician in the U.S. Senate,⁷⁰ encouraged the world to address this issue in a calm, reasoned, and rational way.⁷¹ The purpose of the hearing was to examine the benefits of this new technology to agriculture, research, and medicine, and to cool down an overheated public debate.⁷² He reminded Congress that many scientific advances that were at first vilified are now considered commonplace.⁷³ For example, in the 1960's society viewed the idea of cutting out a diseased heart and replacing it with a heart from someone else

⁶⁵H.R. 922, 105th Cong. (1997) (prohibiting federal funding of cloning research).

⁶⁶*Cloning - Challenges for Public Safety: Hearing on S. 368 Before the Subcomm. on Public Health and Safety of the Senate Comm. on Labor and Human Resources*, 105th Cong. (Mar. 12, 1997) (statement of Sen. Christopher S. Bond), available in 1997 WL 128179 (F.D.C.H.).

⁶⁷*See id.*

⁶⁸*See id.*

⁶⁹*See id.*

⁷⁰*See* Marshall, *supra* note 31, at 1733.

⁷¹*Webwire—Holds News Conference Before Testifying Before Congress*, Verbatim Transcript, March 12, 1997, 1997 WL 109078 (F.D.C.H.) (interviewing Dr. Ian Wilmut and U.S. Senator Bill Frist).

⁷²*See* Marshall, *supra* note 31.

⁷³*Cloning - Challenges*, *supra* note 46; *see also* George Johnson, *Ideas & Trends; Ethical Fears Aside, Science Plunges On*, N.Y. TIMES, Dec. 7, 1997, § 4, at 6 (taking the position that:

Gene-splicing, artificial insemination, in vitro fertilization, bovine growth hormone, genetically engineered tomatoes—all jolted people to dig out their yellowed copies of Aldous Huxley and Michael Crichton and tremble before the certainty that the worst was yet to come. Genies were being let out of the bottles. Brave new worlds were approaching.

And in the end, all the bioethical agonizing was largely beside the point. The scientists kept quietly, deliberately working away, incrementally improving technology. What seemed scary to people slowly started to seem interesting, and maybe useful. Looking back over the years, it's hard to find a case in which the unthinkable remained unthinkable for very long.)

as terrifying and unethical.⁷⁴ Today, heart transplants are a modern miracle.⁷⁵ In October, 1997, Sen. Frist published an article which described the task of the Senate as striking "the delicate balance of regulating science in order to ensure that this technology is harnessed for good, without trespassing on the liberties of the research community."⁷⁶ He also said that as elected leaders "we must resist the temptations of knee-jerk politics and carefully sift facts from among the chaff of many fictions."⁷⁷

R. Alta Charo, J.D., member of the National Bioethics Advisory Commission, warned that proposals to ban human cloning research could be challenged under First Amendment claims of freedom of inquiry.⁷⁸ Although these claims would be novel, they would nonetheless be possible to make.⁷⁹ She stated that several states, such as Arizona and Michigan, have laws that prohibit experimentation on embryos or restrict research on fetuses.⁸⁰ She also noted that Alabama, California, Florida, and New York recently introduced bills that would restrict or prohibit cloning.⁸¹ The constitutionality of these efforts has yet to be determined.⁸²

Professor George J. Annas, J.D., M.P.H. also testified at the hearing.⁸³ He suggested three basic models for regulating scientific/medical policy-making: 1) the market (which our society tends to worship), 2) professional standards (which we distrust), and 3) legislation (which we disdain).⁸⁴ Because the market has no morality, we can't leave important values such as human rights and human dignity to its whim.⁸⁵ Mr. Annas concluded with a

⁷⁴See *id.*

⁷⁵See *id.*

⁷⁶Bill Frist, *Human Cloning Debate May Be Greatest Test to Date*, THE HILL, Oct. 22, 1997, at 29.

⁷⁷See *id.*

⁷⁸*Cloning - Challenges for Public Safety: Hearing on S. 368 Before the Subcomm. on Public Health and Safety of the Senate Comm. on Labor and Human Resources*, 105th Cong. (Mar. 12, 1997) (statement of R. Alta Charo, J.D., Associate Professor of Law and Medical Ethics, University of Wisconsin-Madison), available in 1997 WL 128170 (F.D.C.H.).

⁷⁹See *id.*

⁸⁰See *id.*

⁸¹See *id.*

⁸²See *id.*

⁸³*Cloning - Challenges for Public Safety: Hearing on S. 368 Before the Subcomm. on Public Health and Safety of the Senate Comm. on Labor and Human Resources*, 105th Cong. (Mar. 12, 1997) (statement of George J. Annas, J.D., M.P.H., Professor and Chair, Health Law Department; Founder, Law, Medicine and Ethics Program, Boston University School of Public Health), available in 1997 WL 149022 (F.D.C.H.).

⁸⁴See *id.*

⁸⁵See *id.*

recommendation to legislate the establishment of a Human Experimentation Agency with both rulemaking and adjudicatory authority in the area of human experimentation.⁸⁶ The Agency would put the burden of proof on the researchers to provide a compelling reason to use cloning technology.⁸⁷

Finally, Mr. James A. Geraghty, president and CEO of Genzyme Transgenics Corporation, reminded the committee that the biotechnology industry has been very careful not to engage in research that is unacceptable to the American public.⁸⁸ The industry observed a voluntary moratorium on cloning bacteria until the practice was determined to be safe, and it currently observes a moratorium on germ-line therapy.⁸⁹ He urged Congress not to rush to produce legislation that might restrict "widely accepted technology with great potential therapeutic benefits."⁹⁰

On Wednesday, April 9, 1997, the Hon. Lee H. Hamilton of Indiana inserted his Washington Report for Wednesday, March 26, 1997 into the Congressional Record.⁹¹ He reminded legislators of the medical and agricultural applications of cloning, such as developing animals whose organs can be used for human transplants, developing animal milk proteins used to treat disease, creating improved breeds of livestock, and potential applications for growing new skin for burn victims, culturing bone marrow for treating cancer patients, manipulating genes to cure sickle cell anemia, and treating infertility.⁹²

On June 7, 1997, the National Bioethics Advisory Commission submitted its report, "Cloning Human Beings," to President Clinton.⁹³ The Commission concluded that the cloning of DNA, cells, tissues, and non-human animals using somatic cell nuclear transfer technology and other cloning techniques is not ethically problematic.⁹⁴ While they found human cloning to be repugnant, they were also repulsed by the prospect of restricting scientific inquiry.⁹⁵ The panel basically "hung its hat" on the safety issue.⁹⁶ Henry Shapiro, chairman

⁸⁶*See id.*

⁸⁷*See id.*

⁸⁸*See Cloning-Challenges, supra* note 39.

⁸⁹*See id.*

⁹⁰*See id.*

⁹¹143 CONG. REC. E607-03 (daily ed. Apr. 9, 1997) (statement of Hon. Lee H. Hamilton).

⁹²*See id.*

⁹³*See President Clinton, supra* note 32.

⁹⁴*Senate Subcommittee Explores Impact of Doubling NIH Funding over Five Years*, HEALTH CARE DAILY (BNA), June 12, 1997, at D8.

⁹⁵Charles Marwick, *Put Human Cloning on Hold, Say Bioethicists*, JAMA, July 2, 1997, at 13.

⁹⁶*Clinton Calls for Human Cloning Ban*, NEWSDAY, June 10, 1997, at A19, available in 1997 WL 2698277.

of the Commission, stated, "[i]t seems clear to all of us, given the state of science in this area, that any attempts to clone human beings via somatic cell transfer techniques is uncertain in its prospects, is unacceptably dangerous to the fetus, and is morally unacceptable at this time."⁹⁷ The Commission feared the risk of horribly deformed and suffering babies.⁹⁸ It took some 277 failures before Dolly was born healthy and normal.⁹⁹ The report concluded that some research could continue without risking deformed babies if the embryos are never implanted in a woman's womb.¹⁰⁰ Fearing legislation might interfere with other kinds of cloning research holding the promise of medical breakthroughs, the Commission did not recommend an all-inclusive ban.¹⁰¹ The report cautioned that laws should be carefully written to avoid restricting potentially beneficial research.¹⁰² "[A]ny legislation should be temporary and subject to review within a [three]-to [five]-year period. . . ."¹⁰³ Additional recommendations included:

- the reaffirmation that no federal funds be used to clone human beings;
- the urging of privately funded scientists and clinicians to adhere to the voluntary moratorium imposed by Clinton in March;
- the finding that the new technology may have many agricultural and medical benefits; and
- the pledge to work with other countries, such as Great Britain, Denmark, Germany, Australia, and Spain, to enforce the ban on human cloning.¹⁰⁴

The report also cleared up a number of misunderstandings about cloning held by the public.¹⁰⁵ Contrary to popular science fiction, cloning can not create an instantaneous full-grown adult, nor can it create an exact copy of an existing, or previously existing, person.¹⁰⁶ The report stated, "[a]lthough genes provide the building blocks for each individual, it is the interaction among a person's genetic inheritance, the physical and cultural environment, and the process of learning that result in the uniqueness of each individual human. Thus the idea that . . . cloning could be used to recreate exemplary or evil people has no scientific basis and is simply false."¹⁰⁷

⁹⁷See *President Clinton*, *supra* note 32.

⁹⁸See *Clinton Proposes*, *supra* note 96.

⁹⁹See *id.*

¹⁰⁰See *id.*

¹⁰¹See *Grygotis*, *supra* note 50.

¹⁰²See *id.*

¹⁰³See *Marwick*, *supra* note 95, at 13.

¹⁰⁴See *President Clinton*, *supra* note 32.

¹⁰⁵See *Marwick*, *supra* note 95.

¹⁰⁶See *id.*

¹⁰⁷See *id.*

Sen. Bond was critical of the report because it did not ban cloning outright, and he was wary of the language "at this time."¹⁰⁸ He preferred a statement that cloning was "wrong, period, and should be banned."¹⁰⁹ This concept was criticized in testimony before the commission. Randolfe Wicker of Clone Rights United Front argued, "[n]othing can prevent the age from dawning. Research is the only way to perfect the procedure, outlawing it puts it into the back alleys. Human cloning is a reproductive option, and should be available to all."¹¹⁰

Two days later, on June 9, 1997, President Clinton proposed legislation to ban human cloning but permit research and encourage debate.¹¹¹ During his Rose Garden announcement, President Clinton congratulated the National Bioethics Advisory Commission on three months of rigorous exploration of the scientific, moral, and spiritual dimensions of human cloning and thanked them for their report.¹¹² He reiterated the Commission's conclusion that "[a]ttempting to clone a human being is unacceptably dangerous to the child and morally unacceptable to our society."¹¹³ He sent Congress legislation that prohibits public or private researchers from using these new techniques to create a child.¹¹⁴ Because this technology promises revolutionary new treatments and cures, however, the President was careful not to prohibit these techniques for cloning DNA in cells, or the cloning of animals.¹¹⁵ The technology can lead to improved strains of agricultural animals and advanced medical therapies, such as skin grafts for burn victims, new bone tissue for accident victims, and nerve cells for spinal cord injury victims.¹¹⁶ He also included a five year sunset clause, so the issue can be reviewed in the future.¹¹⁷

A second hearing before the Senate's Public Health and Safety Subcommittee entitled "Ethics of Human Cloning" was held on June 17, 1997.¹¹⁸ Dr. Ezekiel J. Emanuel, a member of the National Bioethics Advisory Commission,

¹⁰⁸See *id.*

¹⁰⁹See *id.*

¹¹⁰See Marwick, *supra* note 95.

¹¹¹Remarks Announcing the Proposed "Cloning Prohibition Act of 1997," 33 WEEKLY COMP. PRES. DOC. 844 (June 9, 1997) [hereinafter *Remarks Announcing*] (speaking at 11:56 a.m. in the Rose Garden at the White House).

¹¹²See *id.*

¹¹³See *id.*

¹¹⁴See *id.*

¹¹⁵See *id.*

¹¹⁶Tim Friend & Bill Nichols, *Clinton Act Draws Line at Human Cloning*, USA TODAY, Aug. 6, 1997, at 1D.

¹¹⁷See *Remarks Announcing*, *supra* note 111.

¹¹⁸*Ethics of Human Cloning: Hearing on S. 368 Before the Subcomm. on Public Health and Safety of the Senate Comm. on Labor and Human Resources*, 105th Cong. (June 17, 1997) (statement of Ezekiel J. Emanuel, M.D., Ph.D.), available in 1997 WL 329495 (F.D.C.H.).

addressed the panel.¹¹⁹ He first noted that nothing the Commission recommended prohibits the cloning of animals, DNA or cells, or research into the development of cell-based therapies.¹²⁰ He then laid out the ethical arguments for and against human cloning.¹²¹ The two main arguments in favor of the cloning of humans are the right to reproductive liberty and the right to scientific inquiry.¹²² Ethical arguments opposed to the cloning of humans relate to "1) physical harms, 2) psychological harms to the child, and 3) harms to shared social understandings and values."¹²³ He concluded by encouraging continued exploration of the ethical concerns related to this technology.¹²⁴ In a few years, with additional research, these arguments will have either "persuaded enough people or proven to be less important."¹²⁵

Law Professor John Robertson of the University of Texas Law School cautioned against hastily enacted legislation.¹²⁶ He said, "a federal criminal prohibition on human cloning risks depriving infertile couples of a potentially legitimate way of forming families, threatens established practices in reproductive medicine and genetic screening, and would establish a dangerous precedent for federal intervention in family and reproductive matters."¹²⁷

On July 21, 1997, the House of Representative's Subcommittee on Science held its third legislative hearing on the prohibition of Federal funding for human cloning research.¹²⁸ The hearing discussed the parameters for legislating Federal funding for human cloning research and reviewed H.R. 922.¹²⁹

Father Kevin Wildes, associate director of the Kennedy Institute of Ethics at Georgetown University in Washington, D.C., reminded participants of the evil that comes from science divorced of morality—the work of Nazi researchers, and our own public health agency's investigations of radiation and syphilis.¹³⁰

¹¹⁹*See id.*

¹²⁰*See id.*

¹²¹*See id.*

¹²²*See id.*

¹²³*See Ethics of Human Cloning, supra* note 118.

¹²⁴*See id.*

¹²⁵*See id.*

¹²⁶*See Ethics & Theology, supra* note 22.

¹²⁷*See id.*

¹²⁸*Banning Federal Funds for Human Cloning Research: Hearing on H.R. 922 Before the Subcomm. on Technology of the House Comm. on Science, 105th Cong. (July 22, 1997) (statement of Constance A. Morella, Chairwoman), available in 1997 WL 465244 (F.D.C.H.).*

¹²⁹*See id.*

¹³⁰*Banning Federal Funds for Human Cloning Research: Hearing on H.R. 922 Before the Subcomm. on Technology of the House Comm. on Science, 105th Cong. (July 22, 1997)*

He advocated carefully drafted federal legislation with built-in review mechanisms which would prevent abuses of this technology.¹³¹

One of the most persuasive arguments for caution in banning research was made by Dr. Arthur F. Haney of the American Society for Reproductive Medicine ("ASRM"). In his testimony he stated that freedom of scientific inquiry was one of the highest values of scientists and physicians.¹³² Because the scientific method demands this freedom, the scientific community has only reluctantly accepted regulation of science.¹³³ However, he felt that at this time, human cloning merits this type of regulation.¹³⁴ The ASRM supported legislation prohibiting "cloning existing human beings using somatic cell nuclear transfer" if the bill included a sunset clause and a preemption clause so states could not undo the progress made at the national level.¹³⁵ However, Dr. Haney felt it was crucial to continue research in the field.¹³⁶

Over the past several years we have developed an interesting rhythm in medical advances. A research discovery is made, it results in a hue-and-cry. After some time goes by, we discover the results are not as dire as we feared, and we have a new and accepted treatment which assists infertile couples. From transplant surgery to the birth control pill, we have seen this cycle repeated. Fortunately, we did not outlaw organ transplants or hormonal birth control. We allowed research to proceed to refine the techniques while we also allowed the ethics surrounding them to develop. Rather than give in to the initial fears, we let knowledge overcome them.¹³⁷

The American Association for the Advancement of Science sponsored a forum on cloning on June 25, 1997.¹³⁸ There seemed to be consensus among

(statement of Kevin Wm. Wildes, S.J., Associate Director, The Kennedy Institute of Ethics) (citing United States Advisory Committee on Human Radiation Experiments, Final Report (Washington, D.C.: Superintendent of Documents, 1995), *available in* 1997 WL 465244 (F.D.C.H.); JAMES JONES, *BAD BLOOD: THE TUSKEGEE SYPHILIS EXPERIMENT* (1981)).

¹³¹*See id.*

¹³²*Banning Federal Funds for Human Cloning Research: Hearing on H.R. 922 Before the Subcomm. on Technology of the House Comm. on Science*, 105th Cong. (July 22, 1997) (statement of Arthur F. Haney, M.D., President-elect, American Society for Reproductive Medicine), *available in* 1997 WL 410653 (F.D.C.H.) [hereinafter *Banning Federal Funds*].

¹³³*See id.*

¹³⁴*See id.*

¹³⁵*See id.*

¹³⁶*See id.*

¹³⁷*Banning Federal Funds*, *supra* note 132.

¹³⁸*Don't Be Quick to Ban Cloning, Scientist Say*, WASHINGTON (REUTERS), June 26, 1997 [hereinafter *Don't be Quick to Ban*].

the scientific community that application of this technology to humans, at this time, would be unsafe and unethical.¹³⁹ Maxine Singer, president of the Carnegie Institution of Washington, expressed the concern of the scientific community about the precedent that a ban on cloning would set.¹⁴⁰ "To have national legislation governing what people can do in laboratories would be a very big step . . . in the wrong direction," she said.¹⁴¹ "We have a very strong tradition of freedom in our country, and we have to consider very carefully when we institute new brakes on these freedoms."¹⁴²

On July 25, 1997, Rep. Porter submitted a report explaining the changes in H.R. 2264.¹⁴³ The Departments of Labor, Health and Human Services, Education, and Related Agencies Appropriation Bill, 1998 included slight modifications to the language which had the effect of prohibiting human cloning.¹⁴⁴

The House Science Committee voted to recommend enactment of H.R. 922, The Human Cloning Research Prohibition Act, on July 29, 1997.¹⁴⁵ The bill supported a permanent ban on federal funding of any research that includes the use of human somatic cell nuclear transfer technology to create an embryo.¹⁴⁶ The Chair of the Subcommittee, Rep. Constance Morella (R-Md.), did not support the bill out of concern that legitimate research would be inadvertently banned.¹⁴⁷ Because of the outcry against the bill as written, Rep. Ehlers did agree to insert language defining permissible research, and a requirement that the National Research Council review the impact the legislation has on research and suggest changes.¹⁴⁸ Chuck Ludlum of the Biotechnology Industry Organization ("BIO") said, "[t]o be perfectly clear, we would not endorse the bill We remain skeptical of the need for a legislative ban."¹⁴⁹

According to the Pharmaceutical Research and Manufacturers of America ("PRMA"), as of August 6, 1997, thirteen states have drawn up bills to ban

¹³⁹*See id.*

¹⁴⁰*See id.*

¹⁴¹*Id.*

¹⁴²*Id.*

¹⁴³H.R. REP. NO. 205, 105th Cong., 1st sess. (1997) (H.R. 2264 - Appropriations Bill 1998).

¹⁴⁴*See id.*

¹⁴⁵Lisa Seachrist, *House Science Committee Reports Cloning Bill: Level of Support is Unclear*, BIO WORLD TODAY, July 30, 1997, available in 1997 WL 11130685.

¹⁴⁶*See id.*

¹⁴⁷*See id.*

¹⁴⁸*See id.*

¹⁴⁹*See id.*

human cloning and three bills have been introduced in Congress.¹⁵⁰ The State of California's bill prohibits a person from cloning a human being and levies large penalties for violations.¹⁵¹ The pharmaceutical industry feels that genetic research is invaluable in improving people's lives, and favors few restrictions on cloning.¹⁵² Alan Homer of PRMA said in a statement, "For the sake of patients and the sake of generations to come, genetic research must continue."¹⁵³

In October of 1997, British scientists made another blip on international radar screens. Scientists announced their success in creating headless frogs, devoid of a central nervous system.¹⁵⁴ The scientists believed that the same process could be used to grow human hearts, livers, and kidneys in an embryonic sac in an artificial womb.¹⁵⁵ Professor Jonathan Slack, professor of developmental biology at Bath University and the research team leader, said that it would be unacceptable to use intact cloned human embryos because they would have to be "killed."¹⁵⁶ However, it might be feasible and acceptable to take a single cell and somehow grow a complete organ from it in a bottle.¹⁵⁷ The advantage of such technology would be a perfect match for patients requiring a transplant, and there would be no need for drugs to prevent tissue rejection.¹⁵⁸ It would also resolve the issue of organ shortages and waiting lists.¹⁵⁹

Although the advent of the headless frogs kept cloning in the news throughout the fall of 1997, it was the startling announcement of Dr. Richard Seed that reignited the legislative fury over the prospect of human cloning. At a conference at Chicago-Kent College of Law on December 5, 1997, Dr. Seed announced he had already taken steps to try human cloning.¹⁶⁰ He alleged he had assembled a team of obstetrician/gynecologists, embryologists, lawyers, psychologists, and social workers, and had interviewed potential cloning

¹⁵⁰See *Language of Privacy*, *supra* note 33, at D4.

¹⁵¹S.B. 1344, 1997-98 Reg. Sess. (Cal. 1997)(providing administrative penalties for cloning a human being of \$1,000,000 for institutions and \$250,000 for individuals or twice the pecuniary gain, if greater).

¹⁵²See *Friend & Nichols*, *supra* note 116.

¹⁵³*Id.*

¹⁵⁴See *British Tinkering*, *supra* note 24.

¹⁵⁵See *id.*

¹⁵⁶See *id.*

¹⁵⁷See *id.*

¹⁵⁸Nadia Hall, *Headless Clones Will Aid Transplants in Ten Years*, PRESS ASSOCIATION NEWSFILE, Oct. 19, 1997.

¹⁵⁹See *id.*

¹⁶⁰Marilynn Marchione, *Humans May Be Cloned Soon, Scientist Claims: Biologist Shocks Colleagues with News of Project in Chicago*, MILWAUKEE J. SENTINEL, Dec. 6, 1997 at 1.

clients.¹⁶¹ Dr. Seed told *The Washington Times*, "I think pregnancy [via human cloning] could be achievable in less than one year."¹⁶²

Bioethicists and scientists were appalled and publicly condemned Dr. Seed. Arthur Caplan, director of the Center for Bioethics at the University of Pennsylvania, called Dr. Seed's forecast of pregnancies in a year "goofy" and "nonsense."¹⁶³ Many are concerned that such radical grandstanding will undermine public support for important medical research in this area.¹⁶⁴ Ethicist Alta Charo, J.D. warned that the announcement may "tighten the noose around cloning" and kill viable forms of research in the process.¹⁶⁵ Lawmakers in Wisconsin, Illinois, Connecticut, and Ohio responded to Dr. Seed's announcement with proposals for bills criminalizing the act of cloning and/or fines for institutions that participate.¹⁶⁶

Dr. Seed said that if he was barred from establishing his Human Clone Clinic in the United States, he would simply move his lab to another country, possibly Mexico.¹⁶⁷ The Mexican Health Ministry quickly rejected this suggestion calling it "irresponsible," and stated that it showed a "deep lack of knowledge of Mexican health policy."¹⁶⁸ Dr. Seed later expressed hope that he could work with Greek scientists to develop a clinic in Greece, but that country already signed a European treaty prohibiting cloning.¹⁶⁹

Sen. Christopher "Kit" Bond responded on January 7, 1998 with a statement that he would push an emergency ban on human cloning through Congress when it reconvened at the end of the month.¹⁷⁰ President Clinton responded on January 10, 1998 with a call to Congress to pass legislation that would ban the procedure.¹⁷¹ Addressing Dr. Seed, the President stated:

¹⁶¹See *id.*

¹⁶²Joyce Howard Price, *Cloning Touted as Infertility Solution; Biologist's Proposal Draws Threat of Ban*, THE WASH. TIMES, Dec. 11, 1997, at A9.

¹⁶³See *id.*

¹⁶⁴Giña Kolata, *Proposal for Human Cloning Draws Dismay and Disbelief*, N.Y. TIMES, Jan. 8, 1998, at A22.

¹⁶⁵Ron Seely, *Ethicist Warns Against Rash Acts; Valuable Research Endangered, She Says*, WIS. ST. J., Jan. 9, 1998, at A1.

¹⁶⁶See *id.* See also *Lawmakers Move to Ban Human Cloning*, U.P.I., Jan. 9, 1998, at Domestic News.

¹⁶⁷See *id.*

¹⁶⁸*Mexico Says US Clone Scientist Not Welcome*, AGENCE FRANCE PRESSE (Mexico City), Jan. 9, 1998, at International News; Andrew Stern, *Scientist Foresees 200,000 Human Clones a Year*, AAP NEWSFEED, Jan. 9, 1998.

¹⁶⁹*Seed Hopes to Cooperate with Greece on Human Cloning*, XINHUA NEWS AGENCY, Feb. 19, 1998; *US Ban 'Would Not Deter Human Cloning Effort'*, THE HERALD (GLASGOW), Feb. 20, 1998, at 14.

¹⁷⁰*Bond Denounces Imminent Human Cloning Effort*, CONG. PRESS RELEASE, Jan. 7, 1998.

¹⁷¹*Clinton Speaks Out Against Cloning of Human Beings*, HOUSTON CHRON., Jan. 11, 1998

The vast majority of scientists and physicians in the private sector have refrained from using these techniques improperly, and have risen up to condemn any plans to do so. But we know it's possible for some to ignore the consensus of their colleagues and proceed without regard for our common values.¹⁷²

However, after a year of national debate, attitudes about cloning began to shift. Although the scientific community flatly denounced Dr. Seed, a minority began saying that the technique was not all bad, and was not that far off.¹⁷³ Lori Andrews, professor at Chicago-Kent College of Law, told the *Chicago Sun-Times*: "I've definitely noticed a change among reputable scientists at meetings When reporters aren't around, they're beginning to say there might be some benefits; the risks aren't as great as we might have imagined."¹⁷⁴ As the general public realized they dealt with clones everyday (e.g., twins and triplets are genetic clones of each other) the perceived menace of clones receded.¹⁷⁵ In his remarks to the American Association for the Advancement of Science, President Clinton contrasted Benjamin Franklin's regret at not being able to see what advances science would bring in the future, and modern authors' and screenwriters' portrayal of a frightening future where science runs amok.¹⁷⁶ He urged Americans to embrace the future: "[W]e must never for a moment be afraid of the future. Instead, we must envision the future we intend to create."¹⁷⁷

Heeding the President's call to stop Dr. Seed, Senate Republicans introduced S. 1601, the Human Cloning Prohibition Act of 1998, on February 3, 1998, and moved that all debate on the bill end and a vote be taken.¹⁷⁸ Concern over the loose wording of the bill was intense, and the motion was voted down.¹⁷⁹ Although he supported legislation for a ban, President Clinton opposed the bill because it was too "far-reaching."¹⁸⁰

The debate revealed that the Food and Drug Administration ("FDA") had asserted jurisdiction over the area and will prevent these experiments until it

at A1.

¹⁷²President Clinton's Weekly Radio Address, FED. NEWS SERVICE, Jan. 10, 1998.

¹⁷³Bryan Smith, *Its Time Will Come, Some Doctors Say*, CHI. SUN-TIMES, Jan. 8, 1998, at 8.

¹⁷⁴*Id.*

¹⁷⁵Michael Gough, *Regulation is Useless*, USA TODAY, Jan. 9, 1998, at A13.

¹⁷⁶Remarks to the American Association for the Advancement of Science in Philadelphia, Pennsylvania, 34 WEEKLY COMP. PRES. DOC. 254 (Feb. 13, 1998).

¹⁷⁷*Id.*

¹⁷⁸Lizette Alvarez, *Senate, 54-42, Rejects Republican Bill to Ban Human Cloning*, N.Y. TIMES, Feb. 12, 1998, at A20.

¹⁷⁹144 CONG. REC. S599, 608 (Feb. 11, 1998).

¹⁸⁰See Alvarez, *supra* note 178.

has resolved all questions regarding safety.¹⁸¹ The Acting FDA Commissioner, Michael A. Friedman, said that the FDA would have to approve anyone trying to clone a person.¹⁸² The FDA reasoned that cloning is a type of cellular genetic therapy which is regulated under the Food, Drug and Cosmetic Act.¹⁸³ According to Sen. Roth, this claim eliminated the need for Congress to act so hastily.¹⁸⁴

The American Medical Association ("AMA") also responded to the FDA's announcement.¹⁸⁵ Chairman of the AMA's Board of Trustees, Thomas R. Reardon, M.D., stated: "The Food and Drug Administration's decision to assert regulatory authority over human cloning bolsters our call for this voluntary ban."¹⁸⁶

The final twist in Dolly's extraordinary story is that she may not be so extraordinary after all.¹⁸⁷ Dr. Wilmut told a conference of geneticists that "[t]here is a remote possibility that the cell used to produce Dolly came from a foetus rather than from the adult."¹⁸⁸ However, the international debate on the issue of human cloning and whether science should be regulated is still a timely one.

III. THE INTERNATIONAL RESPONSE

A. International Governments

Because the United States operates in a global community, any solution to the human cloning problem it adopts must be international in perspective.¹⁸⁹ Dr. Ian Wilmut, Dolly's creator, urges a worldwide prohibition of human cloning.¹⁹⁰

¹⁸¹ 144 CONG. REC. S561, 562 (Feb. 10, 1998)(statement of Mr. Kennedy).

¹⁸² *FDA Asserts Human Cloning Authority*, FACTS ON FILE WORLD NEWS DIGEST, Jan. 22, 1998, § A2, at 29.

¹⁸³ *See id.*

¹⁸⁴ 144 CONG. REC. S599, *supra* note 179, at S602.

¹⁸⁵ *AMA Recommends Voluntary Moratorium on Human Cloning*, U.S. NEWswire, Feb. 12, 1998.

¹⁸⁶ *See id.*

¹⁸⁷ Christy Campbell, *Scientist Admits that Dolly May Not Be 'Wonder Clone'*, SUNDAY TELEGRAPH LIMITED, Feb. 22, 1998, at 15.

¹⁸⁸ *See id.* ("Foetal cells can be present in the circulatory system of some animals during pregnancy.")

¹⁸⁹ *See Cloning - Challenges Hearing on S. 368*, *supra* note 14.

¹⁹⁰ Ryuich Otsuka, *Creator of Dolly Stresses Benefits of Further Research on cloning*, THE DAILY YOMIURI, June 7, 1997.

Several countries, including France, Denmark, and the Netherlands, already forbid embryo research making legal cloning impossible.¹⁹¹ Great Britain and Belgium allow embryo research, but within certain, highly regulated parameters.¹⁹² Spanish Law 35/1988 emphatically prohibits human cloning.¹⁹³ Germany also forbids the process.¹⁹⁴ The German Research Association, haunted by Nazi attempts at a master race, urged the world to join them in a ban against human cloning.¹⁹⁵

In the UK, there was major concern that the 1990 Human Fertilization and Embryology Act would not prohibit the cloning of human beings.¹⁹⁶ The law prohibits the transplant of nuclei into embryos, but in the Dolly experiment, the nuclei were transferred into eggs.¹⁹⁷ This is a prime example of the necessity of flexibility in drafting legislation on scientific discoveries. Science changes, but the law is static.

On March 5 and 6, 1997, the Parliamentary Committee on Science and Technology heard testimony from the Human Fertilization and Embryology Authority ("HFEA") and researchers from the Roslin Institute.¹⁹⁸ HFEA preferred a "flexible approach" to changes in the law, to protect future research that might benefit mankind.¹⁹⁹ Roslin team leader Ian Helmut reminded lawmakers of the wide range of therapeutic applications for their new technique, such as advancing "the production of human proteins, such as clotting factors, from transgenic livestock" which could be hindered by poorly worded legislation.²⁰⁰

On January 29, 1998, two British governmental bodies, the Human Genetics Advisory Commission and the Human Fertilization and Embryology Authority, stated that laboratories could apply for permits to clone human embryos, but these embryos could not be brought to term.²⁰¹ This position

¹⁹¹See *European Union Agrees*, *supra* note 43.

¹⁹²See *id.*

¹⁹³Law No. 35/1988 of 22 November 1988 on assisted reproduction procedures, (B.O.E., 1998, 282), *reprinted in* 40 INT'L DIG. HEALTH LEGIS. 82, 82 (1989).

¹⁹⁴See *European Union Agrees*, *supra* note 43.

¹⁹⁵*France's Chirac to Seek Ban on Human cloning*, L.A. TIMES, Apr. 30, 1997, at A13 [hereinafter *France I*].

¹⁹⁶Kelly Morris, *UK Hears Evidence on Cloning of Human Beings*, THE LANCET, Mar. 15, 1997, at 785.

¹⁹⁷See Pennisi, *supra* note 10, at 1415.

¹⁹⁸See Morris, *supra* note 196, at 785.

¹⁹⁹See *id.*

²⁰⁰See *id.*

²⁰¹Clive Cookson, *Complete Cloning of Humans Is to Remain Illegal*, FINANCIAL TIMES (LONDON), Jan. 30, 1998, at 18; *Laboratories Are Told They May Produce Embryo Human Clones*, CHEMICAL BUS. NEWSBASE, Feb. 3, 1998.

mirrors the recommendation of the U.S. National Bioethics Advisory Commission. According to the Human Fertilization and Embryology Act of 1990, the authority may approve research projects involving human embryos up to fourteen days old.²⁰² By limiting the research in this way, the UK draws a bright line between "reproductive cloning," which remains illegal, and "therapeutic cloning" which is used for research or to treat disease.²⁰³

As the months after Dolly's birth progressed, many nations joined in denouncing human cloning, often citing religious and moral motivations. It was reported on March 18, 1997 that Malaysian officials banned human cloning in their country.²⁰⁴ The Malaysian Cabinet exempted cloning of animals such as endangered species or quality livestock from the ban.²⁰⁵ With a Muslim majority, Malaysia enforces Islamic law through their legislation.²⁰⁶ The Cabinet initiated the ban when it decided having multiple selves would go against God's plan.²⁰⁷ In the United Arab Emirates, another Islamic country, a panel of legal and medical experts declared human cloning to be adulterous under Islamic law.²⁰⁸

The next day, the Chinese Academy of Sciences, the country's leading scientific body, placed a ban on human cloning in China.²⁰⁹ Professor Xu Zhiong, vice president of the academy, stated, "banning the use of cloning to copy humans is absolutely necessary to maintain the ethical morality which holds together today's human society."²¹⁰ He also warned about the possible environmental and ecological threats posed by cloning animals, plants, and micro-organisms.²¹¹

On May 30, 1997, the science and technology advisory organization to the Japanese prime minister called for a continued ban on government funding for cloning research.²¹² While emphasizing the need to continue research in cloning animals and human cells, the committee said it would continue deli-

²⁰²See *id.*

²⁰³See *id.*

²⁰⁴See Lumpur, *supra* note 36.

²⁰⁵See *id.*

²⁰⁶See *id.*

²⁰⁷See *id.*

²⁰⁸*Human Cloning Termed "Adulterous" Under Islamic Law*, DEUTSCHE PRESSE-AGENTUR, Jan. 10, 1998.

²⁰⁹See *China Bans I*, *supra* note 36. See also *China Bans Human Cloning*, COMLINE DAILY NEWS BIOTECHNOLOGY & MED., May 22, 1997 (citing XINHUA, May 12, 1997) [hereinafter *China Bans II*].

²¹⁰See *China Bans I*, *supra* note 36.

²¹¹See *id.*

²¹²See *Government Committee Reports*, *supra* note 36.

berating on the issue before initiating more regulation.²¹³ On February 11, 1998, the scientific council of the Japanese Education Ministry released a report calling for a total ban on cloning human cells.²¹⁴ The council requested a code of laws be drafted that would rigidly regulate all research in this area.²¹⁵

In October 1997, an Italian special parliamentary committee finished drafting a law that would ban "granny mums," surrogacy, and human cloning.²¹⁶ It was hoped that the legislation would be passed by the end of the year, said committee president, Marida Bolognesi.²¹⁷ In the same month, the New South Wales government in Australia announced a ban on human cloning, calling the practice "abhorrent."²¹⁸

In February 1998, the Indian Council of Medical Research called for the Indian Parliament to enact legislation that would ban human cloning in India.²¹⁹ South Africa also addressed the issue and proposed legislation was submitted to Parliament.²²⁰ Olive Shisana, a top South African health department official, said the new national health bill would "totally outlaw the practice [of human cloning]."²²¹ Medical experts in the country said that human cloning research was unlikely to be approved by any medical review board regardless of whether the ban was passed in Parliament.²²² Health department officials claimed that South Africa's Human Tissue Act, although it does not explicitly ban cloning, could be interpreted to forbid the process.²²³

As time went on, however, the fevered pitch over cloning seemed to cool. Two Jewish Rabbis declared in January 1998, that human cloning might be allowed under Jewish law.²²⁴ Rabbi Mordecai Halprin of the Israeli Chief

²¹³*See id.*

²¹⁴Alexander Kopnov, *Ban on Research Into Human Cloning Proposed in Japan*, TASS, Feb. 11, 1998.

²¹⁵*See id.*

²¹⁶Richard W. Rome, *Italy Bids to Ban 'Granny Mums'*, THE HERALD (Glasgow), Oct. 25, 1997, at 12.

²¹⁷*See id.*

²¹⁸*Churches Call For Human Cloning Ban*, AAP NEWSFEED, Jan. 9, 1998.

²¹⁹T. M. Kumaraswami, *The Hindu-Editorial: Ban on Human Cloning*, THE HINDU, Feb. 3, 1998.

²²⁰Vuyo Mvoko, *Bill Submitted to Ban Cloning*, BUSINESS DAY (SOUTH AFRICA), Feb. 27, 1998, at 2.

²²¹*South Africa to Ban Human Cloning*, XINHUA NEWS AGENCY, Mar. 5, 1998 [hereinafter *South Africa to Ban*].

²²²Josey Ballenger, *Human Cloning Unlikely in SA*, BUSINESS DAY (SOUTH AFRICA), Feb. 18, 1998, at 5.

²²³*See id.*

²²⁴Victoria Combe, *Cloning May Be Accepted, Says Rabbi*, THE DAILY TELEGRAPH, Jan. 23, 1998, at 5.

Rabbinate and the former Chief Rabbi of Britain, Lord Jakobovits, said there was a place for carefully monitored cloning in modern medicine.²²⁵ Although he had reservations about cloning a complete human being, Rabbi Jakobovits could foresee many advantages for science.²²⁶

The most recent claim of support for human cloning comes from Russia.²²⁷ A parliament member declared that a group of private investors had started financing a cloning project that eventually will clone a human being.²²⁸ At a news conference in March 1998, Russian researchers and parliament leaders spoke against joining any international bans on human cloning.²²⁹

B. International Organizations

A number of international organizations also rallied to denounce human cloning. On February 24, 1997, two days after the announcement of Dolly's birth, the Foundation on Economic Trends said that it had organized 400 religious and health organizations from around the world to push for laws that would ban human cloning.²³⁰ Four days after Dolly was introduced, the Vatican made an urgent appeal for all governments to ban human cloning.²³¹ In a Vatican editorial, theologian Gino Concetti wrote that "persons have the right to be born in a human way and not in a laboratory."²³²

The World Health Organization ("WHO") first responded to Dolly on March 11, 1997.²³³ The Director-General, Dr. Hiroshi Nakajima, said that human cloning would not be acceptable "on ethical grounds."²³⁴ On May 12, 1997, WHO issued an appeal to doctors and researchers to voluntarily refrain from cloning humans until "the scientific, ethical and legal issues have been fully considered."²³⁵ WHO acts as an umbrella group of over seventy medical associations from around the world.²³⁶ The 191-member World Health

²²⁵*See id.*

²²⁶*See id.*

²²⁷*Human Cloning to Start in Russia*, AAP NEWSFEED, Mar. 7, 1998.

²²⁸*See id.*

²²⁹*See id.*

²³⁰Margaret A. Jacobs, *Cloning Faces Few Legal Barriers, but Ethical and Patent Questions*, WALL ST. J., Feb. 25, 1997, at B8.

²³¹*See Vatican Seeks*, *supra* note 34.

²³²*Id.*

²³³*WHO to Open Global Debate on Human Cloning*, EUROPEAN REPORT, Mar. 15, 1997, at sec. no. 2207.

²³⁴*See id.*

²³⁵*Global Group Urges a Voluntary Ban on Human Cloning*, CHI. TRIB., May 12, 1997, at 6.

²³⁶*See id.*

Assembly, the governing body of the WHO, passed this resolution hoping to set a global standard for all scientists.²³⁷ Although WHO lacks enforcement powers, it is expected that the resolution will be widely respected.²³⁸ The resolution recognizes the importance of continuing "ethically acceptable" research, but these new developments in cloning and genetics need to be "carefully monitored and assessed, and the rights and dignity of patients respected."²³⁹

On March 11, 1997, an emergency debate was held in the European Parliament which produced cross-party support for a European-wide ban against research into cloning human beings.²⁴⁰ A Resolution was adopted on January 15, 1998 that called on member states and the United Nations to adopt a universal ban on human cloning.²⁴¹ The European Parliament also called for "an international conference to consider the implications of human cloning."²⁴²

The European Bioethics Convention opened in Oviedo, Spain on April 4, 1997.²⁴³ Twenty-one of the Council of Europe's forty nations immediately signed "the world's first international legally binding rules on human medical research, genetics, embryology, and transplants."²⁴⁴ The Convention represents broad consensus on general issues, but would resolve stickier ones in four protocols to be amended to the main accord.²⁴⁵ Non-Council of Europe states that collaborated in the drafting of the Convention include the USA, Japan, and Canada.²⁴⁶

The European Commission's bioethics advisory panel made a presentation at the Hague in May, 1997 calling for a prohibition on cloning.²⁴⁷ The committee's recommendation left the door open, however, to early stage cloning because of its therapeutic benefits.²⁴⁸ The opinion of the committee was not enforceable as Europe-wide law because the treaty creating the European

²³⁷Health Agency Says Cloning of Humans is 'Unacceptable', CHI. TRIB., May 15, 1997, at 6.

²³⁸See *id.*

²³⁹See *WHO Adopts*, *supra* note 37.

²⁴⁰See *Emergency Debate*, *supra* note 35.

²⁴¹*European Parliament Hostile to Human Cloning*, SPICERS CENTRE FOR EUROPE, Jan. 21, 1998.

²⁴²See *id.*

²⁴³Arthur Rogers, *Bioethics Convention Signed, but Doubts Remain*, THE LANCET, at 1079, Apr. 12, 1997.

²⁴⁴See *id.*

²⁴⁵See *id.*

²⁴⁶See *id.*

²⁴⁷See *European Union Agrees*, *supra* note 43.

²⁴⁸See *id.*

Union only covers patented drugs.²⁴⁹ The organization was left with only two options for enforcement: withhold funding for this kind of research, or reject a patent application on the technique.²⁵⁰

On October 10 and 11, 1997, the Council of Europe met in Strausbourg to support a Protocol to prohibit human cloning that was more sweeping than declarations by UNESCO or the U.S. Cloning Prohibition Act.²⁵¹ "The ban . . . will be added to the European Convention on Biomedicine [The Oviedo Convention]."²⁵² The protocol will simply "prohibit creation of a human being genetically identical to another human being, whether living or dead."²⁵³ The Protocol prohibits the result, rather than the technique leading to that result.²⁵⁴ "The commitment to ban human cloning was one of a series of recommendations to help to strengthen and update the values of democracy, human rights and the rule of law championed by the Council of Europe since its founding in 1949."²⁵⁵ Observers from the U.S. and Japan also attended the summit.²⁵⁶ The forty members of the Council of Europe voted to approve the text of the ban on November 6, 1997,²⁵⁷ and nineteen of the forty members signed the Protocol on January 12, 1998.²⁵⁸

In May, 1997, the World Medical Association ("WMA"), an umbrella group of nearly seventy medical associations, urged the scientific community to refrain from attempting to clone a human.²⁵⁹ The appeal was issued at the end of a meeting of the executive council in France.²⁶⁰ The WMA considered this type of research ethically unacceptable, and urged doctors and researchers to

²⁴⁹*See id.*

²⁵⁰*See id.*

²⁵¹Arthur Rogers, *Europe Takes Steps to Outlaw Human Cloning*, THE LANCET, Oct. 4, 1997, at 1012 (predicting the outcome of the scheduled meeting). *See also* Marcus Warren & Greg Neale, *Euro Ban on Human Cloning*, SUNDAY TELEGRAPH, Oct. 12, 1997, at 1.

²⁵²*See* Warren & Neale, *supra* note 251.

²⁵³*See* Rogers, *supra* note 251, at 1012.

²⁵⁴*See id.*

²⁵⁵*See* Warren & Neale, *supra* note 251.

²⁵⁶*Council of Europe Gathers in Strausberg to Determine Future Role* (CNN World Report, Oct. 19, 1997, 2:09 pm Eastern Time, transcript# 97101911V04).

²⁵⁷*Council of Europe: Draft Additional Protocol to the Convention on Human Rights and Biomedicine on the Prohibition of Cloning Human Beings with Explanatory Report and Parliamentary Assembly Opinion*, 36 I.L.M. 1415, 1417-22 (1997).

²⁵⁸John R. Schmertz, Jr. & Mike Meier, *Nineteen Council of Europe Members Sign Protocol to Oviedo Convention on Bio-Ethics That Would Add Ban on Cloning of Human Genes Set Except as to Isolated Cells or Tissue*, 4 INT'L LAW UPDATE, Feb. 1998.

²⁵⁹*Global Group Urges a Voluntary Ban on Human Cloning*, CHI. TRIB., May 12, 1997, at 6.

²⁶⁰*See id.*

voluntarily abstain "until the scientific, ethical and legal issues have been fully considered."²⁶¹

Also in May, 1997, the International Bioethics Committee ("IBC") of the United Nations Educational, Scientific, and Cultural Organization ("UNESCO") announced that its Universal Declaration on the Human Genome and Human Rights adequately protects against human cloning.²⁶² The Committee has been working on the Declaration for four years.²⁶³ On November 11, 1997, at its biannual conference of seventy-seven countries, UNESCO unanimously passed the Declaration.²⁶⁴ "While the Declaration has no enforcement powers, it is expected to be used as a lever against nations to keep a rein on genetics."²⁶⁵

French President Jacques Chirac said, "the key problem is outlawing it [human cloning] around the world."²⁶⁶ After summoning a panel of ethicists to discuss the "fears" and "fantasies" raised by Dolly, the President asked the Group of Seven²⁶⁷ and the European Council to adopt declarations banning human cloning worldwide.²⁶⁸

At the Summit of Eight hosted in Denver, Colorado in June, 1997, the leaders of the seven leading industrialized nations and Russia released a communiqué stating that these leaders agreed to prevent the cloning of humans.²⁶⁹ "We agree on the need for appropriate domestic measures and close international cooperation to prohibit the use of somatic cell nuclear transfer to create a child."²⁷⁰

In a June, 1997 presentation at the Hague, the European Commission's bioethics advisory panel concurred with the finding of the U.S. National Bioethics Advisory Commission and Britain's Human Fertilization and Embryology Authority: that human cloning should be banned, but research could continue as long as embryos are never implanted in a woman's womb.²⁷¹

²⁶¹See Ballenger, *supra* note 222; see also *South Africa to Ban*, *supra* note 221.

²⁶²See *European Union Agrees*, *supra* note 43.

²⁶³U.S. *Undermines International Ban on Human Cloning*, PR NEWswire, Oct. 17, 1997.

²⁶⁴See Pezzella, *supra* note 42, at 1.

²⁶⁵See *id.*

²⁶⁶See France I, *supra* note 195, at A13.

²⁶⁷The Group of Seven (G7) is made up of the leaders from the seven largest industrialized nations in the world.

²⁶⁸See France I, *supra* note 195.

²⁶⁹G8, *supra* note 38.

²⁷⁰See *id.*

²⁷¹See *European Union Agrees*, *supra* note 43.

It approved early stage cloning research because of its therapeutic possibilities.²⁷² Although the European Commission, as the executive agency for the European Union, can withhold funding for cloning research or reject related patents, it is up to the individual countries to regulate cloning efforts.²⁷³

European standards for biotechnology patents were settled by Ministers from fifteen of the European countries on November 27, 1997 in Brussels.²⁷⁴ The guidelines explicitly forbid patenting of human cloning procedures.²⁷⁵

IV. SCIENTIFIC FREEDOM

A. United States

The word "science" appears only in Article 1, Section 8 of the United States Constitution where Congress is delegated the authority "to promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries."²⁷⁶ One possible explanation for the lack of any other reference to science in the Constitution may be Thomas Jefferson and Benjamin Franklin's idea that "the marketplace of scientific ideas and the needs of an enlightened citizenry were too complex, too interdependent, for any all-or-nothing policy solution."²⁷⁷ It was up to future generations to address the challenges of scientific inquiry. "From the standpoint of science, the health and vigor of the scientific enterprise are obviously dependent upon freedom of scientific research and expression."²⁷⁸

The Supreme Court has never addressed the right of scientists to do research,²⁷⁹ but the Constitution does provide some protection. Most legal critics conclude that the First Amendment's freedom of speech clause protects scientific speech.²⁸⁰ However, the Supreme Court has held that even protected speech does not have an absolute right to freedom.²⁸¹ Certain forms of speech

²⁷²See *id.*

²⁷³See *id.*

²⁷⁴EU Reaches Agreement on Biotech Patent Protection, THIS WEEK IN GERMANY, Dec. 5, 1997.

²⁷⁵See *id.*

²⁷⁶U.S. CONST. art. I, § 8, cl. 8 (providing the authority to create the Federal Patent Office).

²⁷⁷See CARMEN, *supra* note 40, at 12.

²⁷⁸Harold P. Green, *Constitutional Implications of Federal Restrictions on Scientific Research and Communication*, 60 UMKC L. REV. 619, 621 (1992).

²⁷⁹See CARMEN, *supra* note 40, at 34.

²⁸⁰See *id.* at 35.

²⁸¹See *id.* at 36. See also *Abrams v. United States*, 250 U.S. 616 (1919) (Holmes, J., dissenting, "I do not doubt for a moment that by the same reasoning that would justify punishing persuasion to murder, the United States constitutionally may punish speech

have been considered outside the scope of protection when they potentially harm the public.²⁸² Although an argument could be made that human cloning represents a "clear and present danger"²⁸³ to the public, there is no consensus on the issue. Many Americans feel cloning holds the promise of a host of life-saving medical treatments.²⁸⁴ It would be difficult to compare this medical miracle to criminal anarchy, "fighting words," or child pornography—speech the Supreme Court has held is not protected by the First Amendment.²⁸⁵

Some may argue that scientific research is not speech because it involves actions on the part of the researcher. The Supreme Court held in *Brown v. Louisiana* that the rights of freedom of speech and assembly are not confined to verbal expression, but also include actions.²⁸⁶ When scientists stop talking and start experimenting we enter an area of quasi speech or "speech plus."²⁸⁷ Research becomes a type of "symbolic speech" much like students wearing black armbands and antiwar activists burning their draft cards.²⁸⁸ The "plus" triggers higher scrutiny, and laws must be narrowly tailored.²⁸⁹

It seems beyond question that scientific inquiry enjoys First Amendment protection, but the issue remains on how much protection is afforded.²⁹⁰ In *Planned Parenthood of Southeastern Pennsylvania v. Casey*, the Supreme Court

that produces or is intended to produce a clear and imminent danger that it will bring about forthwith certain substantive evils that the United States constitutionally may seek to prevent."); *Whitney v. California*, 274 U.S. 357 (1927) (Brandeis, J., concurring, "But, although the rights of free speech and assembly are fundamental, they are not in their nature absolute."); *Near v. Minnesota*, 283 U.S. 697 (1931) (Hughes, C.J., "[T]he protection [of free speech] even as to previous restraint is not absolutely unlimited.")

²⁸²See *Gitlow v. New York*, 268 U.S. 652 (1925) (holding that advocacy of criminal anarchy, a doctrine to overthrow the government using violence and assassinations, by word or mouth is not protected speech); *Chaplinsky v. New Hampshire*, 315 U.S. 568 (1942) (holding "fighting words" unprotected by the First Amendment); *New York v. Ferber*, 458 U.S. 747 (1982) (rejecting a First Amendment attack on a New York law prohibiting the distribution of child pornography).

²⁸³*Schenck v. United States*, 249 U.S. 47 (1919).

²⁸⁴See *British Scientists*, *supra* note 2; H.R. REP. NO. 105-239, pt. 17, *supra* note 18; *Human Cloning: Hearing on the Review of the Recommendations on Cloning by the President's Commission Before the Subcomm. on Technology of the House Comm. on Science*, *supra* note 21.

²⁸⁵See *supra*, note 282.

²⁸⁶*Brown v. Louisiana*, 383 U.S. 131, 142 (1966).

²⁸⁷See *CARMEN*, *supra* note 40, at 39 (citing *Cox v. Louisiana*, 379 U.S. 503 (1965) and *Buckley v. Valeo*, 424 U.S. 1 (1976)).

²⁸⁸See *id.*

²⁸⁹See *id.*, at 39 (citing *Shuttlesworth v. Birmingham*, 394 U.S. 147 (1969). The Court held that laws can not ban parades or pickets, but they can regulate them); citing *Cox v. Louisiana*, 379 U.S. 559 (1965). The Court held that students at a demonstration were not about to erupt into violence, and therefore the use of teargas was unwarranted).

²⁹⁰See *Green*, *supra* note 278, at 643.

upheld a number of restrictions on abortions using an "undue burden" test.²⁹¹ However, there are certain limitations on how much regulation may be implemented.

Experiments clearly are a form of action, and where restrictions are based on the concern that experiments may result in harm to the public or to the environment, they are easily justified. Indeed there are ample precedents for such restrictions, as in the case of regulation of experiments with new drugs and with nuclear materials and facilities.²⁹²

In both of these examples there was a known, direct danger to citizens or a direct threat to the national security.²⁹³ "If the government deemed the harms from somatic cell nuclear transfer technology to be sufficiently compelling, scientific inquiry could be regulated and even restricted."²⁹⁴ However, as in *Shuttlesworth v. Birmingham*, the Supreme Court would likely hold an absolute ban on cloning research unconstitutional, but would uphold regulating the practice.²⁹⁵

In one of the most famous privacy cases, *Griswold v. Connecticut*, Justice Douglas argued that contraction of the spectrum of knowledge by the State would be inconsistent with the spirit of the First Amendment.²⁹⁶ "The right of freedom of speech . . . includes . . . freedom of inquiry, freedom of thought, and freedom to teach—indeed the freedom of the entire university community."²⁹⁷ The scientific process encompasses First Amendment speech, expression, and privacy rights.²⁹⁸ It is difficult to imagine a government interest which could constitutionally "'contract the spectrum of available knowledge.'"²⁹⁹

²⁹¹505 U.S. 833, 877 (1992) (defining an "undue burden" as one placing a substantial obstacle in the way of a woman seeking an abortion).

²⁹²Green, *supra* note 278, at 623.

²⁹³See *id.*

²⁹⁴See *Ethics of Human Cloning*, *supra* note 118.

²⁹⁵See *Shuttlesworth*, 394 U.S. at 163-64.

²⁹⁶381 U.S. 479, 482 (1965) (enumerating the rights construed in the First Amendment).

²⁹⁷See *id.* (citing *Wieman v. Updegraff*, 344 U.S. 183, 195 (1952) (holding the "loyalty oath" requirement of Oklahoma employees offends Due Process—a State cannot exclude individuals for employment solely on the basis of organizational membership); *Sweezy v. State of New Hampshire*, 354 U.S. 234, 249-50, 261-63 (1957) (holding a university professor did not have to answer questions regarding his lectures or his knowledge of the Progressive Party or its members); *Barenblatt v. United States*, 360 U.S. 109, 112 (1959) (holding the government's interest in having a Committee on Un-American Activities outweighed the interests of the individual); *Baggett v. Bullitt*, 377 U.S. 360, 369 (1964) (finding Washington's oath requirement unduly vague).

²⁹⁸See *CARMEN*, *supra* note 40, at 39.

²⁹⁹See *id.* at 37 (quoting *Griswold v. Connecticut*, 381 U.S. 479, 482 (1965)).

Constitutional protection of scientific inquiry can also be found in the Fourteenth Amendment's due process clause. In *Meyer v. State of Nebraska*, Justice McReynolds noted that prior case law indicates that "liberty" in the Fourteenth Amendment not only refers to freedom from bodily restraint, but also the freedom to acquire useful knowledge.³⁰⁰ Holding unconstitutional a Nebraska law against teaching any language other than English below the eighth grade, he said that states could not arbitrarily interfere with this liberty under the guise of protecting the public interest.³⁰¹ "The American people have always regarded education and the acquisition of knowledge as matters of supreme importance which should be diligently promoted."³⁰²

In the anti-evolution case of *Epperson v. Arkansas*, the Court invalidated the prohibition against teaching evolutionary theory under the religious freedom clause of the First Amendment, but recognized the right to acquire useful knowledge under the Fourteenth Amendment's due process clause.³⁰³ Some commentators regard this case as supporting the principle that the Constitution specially protects science, but it was the religious purpose that was perceived as the violation of the First Amendment.³⁰⁴ The Court found the overriding fact was that Arkansas proscribed the teaching of a segment of the body of knowledge, evolution, for the sole reason that it conflicted with a particular religious doctrine.³⁰⁵ It follows that if Congress rests entirely on moral ground for its legislation to ban cloning, a real constitutional challenge would exist under *Epperson*.

In *Wieman v. Updegraff*, Justice Black addressed the unconstitutionality of requiring state employees, including university faculty, to take a "loyalty oath."³⁰⁶ He stated, "[o]ur own free society should never forget that laws which stigmatize and penalize thought and speech of the unorthodox have a way of reaching, ensnaring and silencing many more people than at first intended."³⁰⁷ A ban on human cloning could also have unintended effects—the stifling of life-saving medical treatments.

Supreme Court Justices have indicated to Congress that attempts to infringe on the pursuit of knowledge will be scrutinized. In *Barenblatt v. United States*, Justice Harlan stated, "[w]hen academic teaching-freedom and its corollary learning-freedom, so essential to the well-being of the Nation, are claimed, this Court will always be on the alert against intrusion by Congress into this

³⁰⁰262 U.S. 390, 399 (1923).

³⁰¹See *id.* at 399-400.

³⁰²*Id.* at 400.

³⁰³393 U.S. 97, 105-106 (1968).

³⁰⁴See Green, *supra* note 278, at 621.

³⁰⁵See *Epperson*, 393 U.S. at 103.

³⁰⁶344 U.S. 183, 195 (1952).

³⁰⁷*Id.*

constitutionally protected domain.³⁰⁸ In the same frame of mind, Justice Warren stated in *Sweezy v. State of New Hampshire* that academic freedom is an area "in which government should be extremely reticent to tread."³⁰⁹

The essentiality of freedom in the community of American universities is almost self-evident. . . . To impose any strait jacket upon the intellectual leaders in our colleges and universities would imperil the future of our Nation. No field of education is so thoroughly comprehended by man that new discoveries cannot yet be made. . . . Scholarship cannot flourish in an atmosphere of suspicion and distrust. Teachers and students must always remain free to inquire, to study and to evaluate, to gain new maturity and understanding; otherwise our civilization will stagnate and die.³¹⁰

Congress must act judiciously in passing legislation regarding this new and expanding field of science. Overzealous censorship could lead to the stagnation and death of important medical research.

B. International

Although many nations and international organizations have attempted to ban human cloning, international law seems to support scientific inquiry and discovery. The European Parliament issued a Resolution on the Ethical and Legal Problems of Genetic Engineering in March, 1989, reaffirming "the principle of freedom of science and research."³¹¹ The Universal Declaration on the Human Genome and Human Rights adopted by UNESCO on November 11, 1997 attempted to allow for the freedom of scientific inquiry while preventing possible abuses.³¹²

The Court in Germany recognized the freedom of scientific inquiry as guaranteeing an individual zone of autonomy to determine the path of scientific pursuit, free from governmental coercion.

Public discourse in contemporary Germany is marked by an open, vibrant, sometimes caustic exchange of the central issues of the day. As in the United States, guarantees of freedom of expression are central to the constitutional order and structure of German society. Unlike speech freedoms in the United States, however, German

³⁰⁸360 U.S. 109, 112 (1959).

³⁰⁹354 U.S. 234, 250 (1957) (holding that petitioner's liberties had been invaded).

³¹⁰See *id.*

³¹¹Elizabeth Ann Pitrolo, *The Birds, the Bees, and the Deep Freeze: Is There International Consensus in the Debate Over Assisted Reproductive Technologies?* 19 HOUS. J. INT'L L. 147, 186 (1996) (citing *Resolution on the Ethical and Legal Problems of Genetic Engineering*, 1989 O.J. (C96) 165).

³¹²UNESCO *Adopts Declaration on Human Genetics, Outlaws Cloning*, AGENCE FRANCE PRESSE, Nov. 11, 1997.

communication rights are carefully circumscribed by distinct textual, legal, cultural, and civility limits.³¹³

V. CONCLUSION

This cloning debate centers on whether government should or should not regulate scientific inquiry, and if so, to what extent.³¹⁴ Should society shear freedom from the back of scientific inquiry because of irrational fears of the unknown?

Social control of science has existed as long as scientific activities have occurred.³¹⁵ In the 17th century, the Church compelled Galileo to retract his support of Copernicus' hypothesis that the world revolves around the sun.³¹⁶ Originally condemned to life imprisonment for his views, Galileo's sentence was commuted by Urban VIII to life-long house arrest.³¹⁷ Galileo fought against intellectual tyranny and campaigned for a basic right of research and free intellectual discourse.³¹⁸ If Galileo were alive today, would public officials enact legislation to stop him from scanning the heavens with his telescope, or to prevent Mendel from testing genetic probabilities in his own private garden?³¹⁹ Socrates and Charles Darwin also suffered society's wrath for their forward-thinking ideas.³²⁰ "Path-breaking science, by its very nature, contains the seeds of culture shock."³²¹

However, over time society begins to accept the unacceptable. "What is unethical in one age is often perfectly acceptable in another."³²² Law professor, Lori Andrews, likes to quote two fertility specialists who wrote thirty years ago "that new reproductive arrangements pass through several predictable stages, from 'horrificed negation' to 'negation without horror' to 'slow and gradual curiosity, study, evaluation, and finally a very slow but steady acceptance.'"³²³

³¹³Edward J. Eberle, *Public Discourse in Contemporary Germany*, 47 CASE W. RES. L. REV. 797, n.432 (1997) (citing 90 BVerfGE1, 13-14 (1994)).

³¹⁴See 143 CONG. REC. *supra*, note 91 at E607.

³¹⁵See Steinberg, *supra* note 44.

³¹⁶See *id.* at 301.

³¹⁷George P. Smith II, *Toward an International Standard of Scientific Inquiry*, 2 HEALTH MATRIX 167, 169 (1992).

³¹⁸See *id.* at 170.

³¹⁹See CARMEN, *supra* note 40, at 38.

³²⁰*Legitimize Cloning or Risk the Consequences*, THE STRAITS TIMES (SINGAPORE), Feb. 11, 1998 [hereinafter *Legitimize Cloning*].

³²¹See CARMEN, *supra* note 40, at 60.

³²²See *Legitimize Cloning*, *supra* note 321.

³²³Gina Kolata, *A Quick Question: Why Not Clone Humans After All? Opposition Fades 9 Months After Success with Lamb*, INT'L HERALD TRIB., Dec. 3, 1997, at 4.

Hon. Lee H. Hamilton of Indiana told the U.S. Congress, "[s]cientists are telling us that some types of human suffering could be alleviated by cloning, so we must not overreact. All of us have to try to understand the science and to reach a sensible conclusion based not on ignorance but on broad informed public debate and understanding."³²⁴

While it is true that society wants science to be free, it also wants science to be responsible.³²⁵ History has not forgotten the scientific atrocities performed by Nazi scientists on concentration camp victims, which lead to the international adoption of the Nuremberg Code.³²⁶ Unfortunately, German scientists were not the only ones to cross over the line of ethics. There are two famous examples of abuse of human subjects in the United States: doctors at the Jewish Chronic Disease Hospital in Brooklyn, New York injected live cancer cells into their patients without telling them what they were receiving, and medical personnel withheld antibiotic treatment for syphilis from black residents of Tuskegee, Alabama so that investigators could monitor the natural history of the disease.³²⁷

So how should lawmakers react to Dolly and this new technology? The law was not meant to react to change, but to direct an agenda for social change.³²⁸ Roger B. Dworkin, Professor of Law at Indiana University School of Law, counsels using the lowest level of legal response (avoiding legislation that is too broad and draconian) unless the costs of using more extreme measures will not outweigh the benefits.³²⁹

Given our present legal institutions and any that seem likely to emerge, the soundest response to a social issue posed by biomedical advance is to begin by assuming that no legal response is necessary. Lawyers and fearful persons can always conjure up catastrophes. Thus, wise jurisdictions have refrained from enacting legislation to solve the easily imagined, but rare problems When, occasionally, real issues have arisen, the common law courts have dealt with them perfectly satisfactorily. Advantage of the common law—its mistakes are cheap and easy to fix. If it ain't broke, don't fix it.³³⁰

However, the actions of the U.S. government do not exist in a vacuum. Once countries outlaw human cloning, the difficulty in policing the practice will increase. "Years ago, Scottish scientists studying in vitro fertilization were

³²⁴See 143 CONG. REC., *supra* note 91, at E608.

³²⁵See *id.*

³²⁶See LIFTON, *supra* note 45.

³²⁷JAMES H. JONES, BAD BLOOD: THE TUSKEGEE SYPHILIS EXPERIMENT (1981).

³²⁸See Smith, *supra* note 318, at 168.

³²⁹ROGER B. DWORKIN, LIMITS: THE ROLE OF THE LAW IN BIOETHICAL DECISION MAKING 169-70 (1996).

³³⁰*Id.* at 18.

subjected to such intense criticism that they took their work underground, continuing it in seclusion until they had the technology perfected."³³¹ This scenario in the realm of human cloning is not only possible, but it is a reality.

Less than two weeks after the announcement of Dolly, Valiant Ventures in the Bahamas announced it will build a laboratory to clone people for a fee.³³² The group is part of a religious movement whose leader, Rael, stated on their website that "cloning will enable mankind to reach eternal life."³³³ In a telephone interview with the group's scientific director, Dr. Brigitte Boisselier said their clients were predominantly parents of dying children.³³⁴ It is likely that Valiant Ventures would produce many unhappy customers and some dead babies before they succeed in their efforts.³³⁵ The *Sunday Telegraph* reported on January 11, 1998 that a cloning company in the Cayman Islands was taking money for a promise to have an option on human cloning once it is perfected.³³⁶ As Dr. Seed has so blatantly shown, "[w]hat the reputable will not do, the disreputable will."³³⁷

Although an international response to Dolly is completely understandable, a universal ban would be disastrous and inappropriate for a number of reasons. First, a ban would force reputable research underground and into "back alleys." Without a mechanism for regulation and review, renegade research will be hidden from the public's watchful eye. "Surely it's better to allow the research here [in the U.S.], where the exchange of scientific information is generally open and where there's an inquiring press, than to drive it overseas and underground."³³⁸ Second, how will such a ban be enforced? Will money be appropriated to fund special task forces to seek out violators? A less expensive and more targeted approach might be to create civil liability for researchers and institutions that create the inevitable deformed babies. Third, there is domestic case law and international precedent to support scientists' freedom of scientific inquiry. At least in the U.S., a complete ban on research would face an uphill constitutional battle in the courts. Carefully drafted regulations with federal oversight and short-term sunset provisions would be the most appropriate response to the little sheep we call Dolly.

MELISSA K. CANTRELL

³³¹See Kluger, *supra* note 56.

³³²See Beardsley, *supra* note 6, at 15; see also *Welcome to Clonaid* (visited Feb. 16, 1998) <<http://www.clonaid.com>>.

³³³See Kolata, *supra* note 164.

³³⁴See *id.*

³³⁵See Beardsley, *supra* note 6, at 16.

³³⁶*We Should Stop Worrying and Learn to Love the Clone*, SUNDAY TELEGRAPH, Jan. 11, 1998, at 31.

³³⁷See *Legitimize Cloning*, *supra* note 321.

³³⁸See Gough, *supra* note 175.