

FOIA MARKER

This is not a textual record. This is used as an administrative marker by the William J. Clinton Presidential Library Staff.

Collection/Record Group: Clinton Presidential Records

Subgroup/Office of Origin: Counsel Office

Series/Staff Member: Shelli Peterson

Subseries:

OA/ID Number: 16438

FolderID:

Folder Title:

[Folder 3]: [Harvard Journal of Law & Technology - "Is There A Right to Clone?: Constitutional Challenges to Bans on Human Cloning" by Lori B. Andrews]

Stack:

S

Row:

115

Section:

2

Shelf:

9

Position:

3

20TH ITEM of Focus printed in FULL format.

Copyright (c) 1998 Harvard Journal of Law & Technology
Harvard Law School

Summer, 1998

11 Harv. J. Law & Tec 643

LENGTH: 19779 words

ARTICLE: IS THERE A RIGHT TO CLONE? CONSTITUTIONAL CHALLENGES TO BANS ON HUMAN CLONING

Lori B. Andrews*

-----Footnotes-----

* Professor of Law, Chicago-Kent College of Law; Director, Institute for Science, Technology, and Law, Illinois Institute of Technology. J.D., 1978, Yale Law School. This article is based, in part, on a background paper prepared for the National Bioethics Advisory Commission. This paper would not have been possible without the generous and creative aid of a talented group of lawyers and law students -- Nanette Elster, Stephanie Grubenhoff, Michelle Hibbert, Laura Hutchinson, Julie Ann Sklaver, and Sheri Tarr.

-----End Footnotes-----

SUMMARY:

... On December 5, 1997, Richard Seed shocked the scientific community by announcing that he intended to begin cloning human beings. ... Clone Rights United Front, a group of gay activists based in New York, demonstrated against the proposed New York legislation that would ban nuclear transplantation research and human cloning because they see human cloning as a significant breakthrough for same-sex reproduction. ... The high rate of laboratory deaths suggests that cloning may in fact damage the DNA of a cell, and scientists urge that Dolly should be closely monitored for abnormal genetic anomalies that did not kill her as a fetus but may have long-term harmful effects. ... For example, eight of the states prohibit some form of research on some product of conception, referred to in the statutes as a conceptus, embryo, fetus, or unborn child. ... However, despite this tradition of decentralization, the federal government may justify regulation of human cloning by linking such regulation to its spending power and/or its power to regulate interstate commerce. ... One of the remaining four federal proposals explicitly invokes the federal government's power under the Interstate Commerce Clause as a justification for federally prohibiting human cloning, regardless of the funding source. ...

"Perhaps in recognition of the surrealistic circumstances they should have spelled it D-A-L-I, instead of D-O-L-L-Y." n1

-----Footnotes-----

n1 Ray Suarez, Talk of the Nation (NPR radio broadcast, Feb. 24, 1997) (transcript on file with author).

-----End Footnotes-----

TEXT:

[*643] [*644] On December 5, 1997, Richard Seed shocked the scientific community by announcing that he intended to begin cloning human beings. n2 Seed planned to use the techniques that Ian Wilmut and Keith Campbell had used to create Dolly the sheep, the first cloned mammal. n3 Dolly resulted from a transfer of the nucleic DNA of an adult mammary tissue cell to the enucleated egg cell of an unrelated sheep, and gestation in a third, surrogate mother sheep. n4

-----Footnotes-----

n2 See Marilyn Marchione, Cloning Research Could Offer Great Benefits, Some Experts Say, MILWAUKEE J. SENTINEL, Jan. 19, 1998, at 1.

n3 See Sharon Begley, Little Lamb, Who Made Thee?, NEWSWEEK, Mar. 10, 1997, at 53, 54.

n4 See I. Wilmut et al., Viable Offspring Derived from Fetal and Adult Mammalian Cells, 385 NATURE 810, 810-813 (1997); see also Michael Specter & Gina Kolata, After Decades of Missteps, How Cloning Succeeded, N.Y. TIMES, Mar. 3, 1997, at A1.

-----End Footnotes-----

Governments worldwide reacted strongly to the idea of human cloning. Nineteen European countries signed an accord banning cloning. n5 President Clinton denounced Seed's plan in a national radio address n6 and renewed his efforts to get Congress to adopt a moratorium on human cloning. When Dolly's birth was first announced in February 1997, President Clinton issued an executive order banning the use of federal funding for human cloning n7 and asked his newly formed National Bioethics Advisory Commission ("NBAC") to prepare a comprehensive report on the scientific, ethical, and legal issues raised by human cloning. n8 When the NBAC report was released in July 1997, Harold T. Shapiro, NBAC Chair, indicated that further public discussion of this [*645] matter is important. Careful to avoid "confusing science and science fiction," Shapiro noted that the public's concerns ranged "from the implications for particular faith commitments, to views regarding the appropriate sphere for human action, to concerns regarding the future of the family, to cumulative apprehensions about the real net benefit of a rapidly advancing technology that some believe is too aggressively pushing aside important social and moral values." n9

-----Footnotes-----

n5 See Robert Davis, 19 Countries Ban Human Cloning, USA TODAY, June 13, 1998, at 1D (discussing agreement signed by Denmark, Estonia, Finland, France, Greece, Iceland, Italy, Latvia, Luxembourg, Macedonia, Moldova, Norway, Portugal, Romania, San Marino, Slovenia, Spain, Sweden, and Turkey).

n6 See President William J. Clinton: Address to the Nation (radio broadcast Jan. 10, 1998); available at <<http://library.whitehouse.gov/Search/Query-RadioAddresses.html>>.

n7 See Transcript of Clinton Remarks on Cloning, U.S. NEWSWIRE, Mar. 4, 1997, available in 1997 WL 571115.

n8 See Letter from President William J. Clinton to Dr. Harold Shapiro, Chairman, National Bioethics Advisory Commission (Feb. 24, 1997) (on file with author), reprinted in NATIONAL BIOETHICS ADVISORY COMMISSION, CLONING HUMAN BEINGS: REPORT AND RECOMMENDATIONS OF THE NATIONAL BIOETHICS ADVISORY COMMISSION, at preface (1997) [hereinafter CLONING HUMAN BEINGS].

n9 Id.

- - - - -End Footnotes- - - - -

The NBAC report recommended that Congress enact federal legislation banning the creation of a child through cloning -- no matter what the source of funds -- for three to five years, at which time the issue should be reconsidered. n10 President Clinton forwarded a bill to Congress based on that recommendation. n11 The president's bill is not the only proposed law banning or regulating human cloning. As of April 1, 1998, seven other bills had been introduced in Congress n12 and eighteen states were considering cloning laws. n13

- - - - -Footnotes- - - - -

n10 See Letter from Dr. Harold T. Shapiro, Chairman, National Bioethics Advisory Commission, to President William J. Clinton (June 9, 1997), reprinted in CLONING HUMAN BEINGS, supra note 8, at preface.

n11 See Cloning Prohibition Act of 1997, H.R. Doc. No. 105-97 (1997).

n12 See S. 1611, 105th Cong. (1998), also labeled S. 1602, 105th Cong. (1998); S. 1601, 105th Cong. (1998), also labeled S. 1599, 105th Cong. (1998); H.R. 3133, 105th Cong. (1998); S. 1574, 105th Cong. (1998); H.R. 923, 105th Cong. (1997); H.R. 922, 105th Cong. (1997); S. 368, 105th Cong. (1997).

n13 As of April 1, 1998, there were bills introduced in Alabama, Connecticut, Delaware, Hawaii, Illinois, Kansas, Maryland, Minnesota, Mississippi, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, South Carolina, Tennessee, and Virginia. See S.B. 68, 1998 Reg. Sess. (Ala. 1998), S.B. 8, 1998 Reg. Sess. (Ala. 1998); H.B. 5475, 1998 Reg. Sess. Gen Assembly (Conn. 1998); S.B. 241, 139th Gen. Assembly, 2d Sess. (Del. 1998); H.B. 3206, 19th Leg. (Haw. 1998); S.B. 1243, 90th Gen. Assembly, 1997-98 Reg. Sess. (Ill. 1998); H.B. 2235, 90th Gen. Assembly, 1997-98 Reg. Sess. (Ill. 1997); H.B. 2846, 77th Leg., 1998 Reg. Sess. (Kan. 1998); H.B. 932, 1998 Reg. Sess. (Md. 1998); H.J.R. 11, 1998 Reg. Sess. (Md. 1998); S.B. 2423, 80th Reg. Sess. (Minn. 1998); H.B. 2730, 80th Reg. Sess. (Minn. 1998); H.B. 996, 1998 Reg. Sess. (Miss. 1998); H.B. 1658, 155th Sess., 2d Year (N.H. 1998); A.B. 329, 208th Leg. (N.J. 1998); A.B. 2849, 207th Leg. (N.J. 1997); S.B. 5993, 221st Leg. Sess. (N.Y. 1998); A.B. 9183, 221st Leg. Sess. (N.Y. 1998); S.B. 2877, 220th Leg. Sess. (N.Y. 1997); A.B. 5383, 220th Leg. Sess. (N.Y. 1997); H.B. 675, 122d Gen. Assembly, 1997-98 Reg. Sess. (Ohio 1998); S.B. 218, 122d Gen. Assembly, 1997-98 Reg. Sess. (Ohio 1998); H.B. 2128, 182d Gen. Assembly, 1997-98 Reg. Sess. (Pa. 1998); H.B. 7123, 1997-98 Leg. Sess. (R.I. 1998); H.B. 3617, 112th Gen. Assembly Sess. (S.C. 1997); S.B. 2295, 100th Gen. Assembly (Tenn. 1998); H.B. 2281, 100th Gen. Asy (Tenn. 1998); H.B. 2198, 100th Gen. Assembly (Tenn. 1998); S.B. 2208,

100th Gen. Assembly (Tenn. 1998); H.B. 752, 1998 Sess. (Va. 1998).

- - - - -End Footnotes- - - - -

[*646] On October 4, 1997, the California legislature adopted a law that created a five-year moratorium on the cloning of a human being. n14 On June 3, 1998, Michigan also adopted a ban on human cloning. n15 No legislature has introduced a bill explicitly permitting human cloning.

- - - - -Footnotes- - - - -

n14 See Act of Oct. 4, 1997, 1997 Cal. Stat. 688.

n15 See Act of June 3, 1998, 1998 Mich. Pub. Acts 108, bill text available in Westlaw, at 1997 MI H.B. 864 (SN); Act of June 3, 1998, 1998 Mich. Pub. Acts 109, bill text available in Westlaw, at 1997 MI H.B. 4846 (SN); Act of June 3, 1998, 1998 Mich. Pub. Acts 110, bill text available in Westlaw, at 1997 MI H.B. 4962 (SN); Act of June 3, 1998, 1998 Mich. Pub. Acts 111, bill text available in Westlaw, at 1997 MI H.B. 5475 (SN) 7 MI H.B. 5475 (SN); Engler Signs Legislation to Ban Human Cloning, Grand Rapids Press, June 4, 1998, at A20.

- - - - -End Footnotes- - - - -

Many medical organizations surveyed by the NBAC, including the American Medical Association, the World Medical Association, and the World Health Organization, find cloning human beings to be unacceptable. n16 In fact, the majority of the thirty-two scientific societies surveyed opposed the procedure, n17 although, notably, the infertility professional societies did not join in advocating a ban. n18 Certain religious groups oppose the procedure as well. In reaction to the cloning of Dolly the sheep, the Vatican stated that a "person has the right to be born in a human way. It is strongly hoped that states . . . will immediately pass a law that bans the application of cloning of humans and that in the face of pressures, they have the force to make no concessions." n19

- - - - -Footnotes- - - - -

n16 See CLONING HUMAN BEINGS, supra note 8, at 99.

n17 See id. at 97 n.17.

n18 See id. at 98.

n19 Id. at 56.

- - - - -End Footnotes- - - - -

This article analyzes the legal issues behind regulating human cloning, focusing specifically on whether a federal ban on cloning humans, such as that proposed by the President, would be constitutional. To give some context to the discussion, Part I of this article describes the scientific procedure of cloning and its potential uses and risks, thus setting the factual basis upon which the later arguments will be founded. Part II addresses the impact of existing laws and regulation on the legality of cloning, focusing especially on state bans on embryo research, and also describes proposed federal and state laws regarding

cloning. The remainder of the paper addresses the three main constitutional challenges to laws banning cloning. Part III analyzes whether a ban on human cloning would unconstitutionally infringe upon scientists' right to scientific inquiry. Part IV assesses whether a ban on human cloning of complete individuals would violate constitutional rights to privacy or liberty in making reproductive decisions. Part V analyzes whether [*647] federal legislation restricting or banning cloning could be challenged as exceeding the federal spending power or the federal power to regulate interstate commerce.

I. THE GOALS AND POTENTIAL IMPACTS OF CLONING RESEARCH

A. What Is Cloning and Why Might it Be Desirable?

Mammalian "cloning" is the manipulation of a cell from an animal or human in such a way that it grows into a virtual copy of that animal or human with identical nucleic DNA. n20 One way to think about it is that cloning is a way to create later-born twins of an individual who is living or has already lived. Unlike naturally occurring twins, however, the clone will not be one hundred percent genetically identical because it will have mitochondrial DNA from the donor of the enucleated egg. n21 In the case of Dolly the sheep, an adult mammary cell containing a copy of every gene needed to make the lamb was extracted, then starved of its nutrients, forcing the cell into a quiescent state. n22 This cell was then fused with an enucleated egg cell -- one in which the nucleus has been extracted -- and an electric current was run through the fused cell, activating it and causing it to begin to divide. These active cells were then implanted into a surrogate mother and carried to term. n23

- - - - -Footnotes- - - - -

n20 See Begley, *supra* note 3, at 54.

n21 See Shirley Tilghman, Address to the National Bioethics Advisory Commission (Mar. 13, 1997), available at <<http://www.all.org/nbac/970313a.htm>>.

n22 See Thomas H. Maugh II, *Brave New World*, L.A. TIMES, Feb. 27, 1997, at B2.

n23 See *id.*; see also Francis C. Pizzulli, Note, *Asexual Reproduction and Genetic Engineering: A Constitutional Assessment of the Technology of Cloning*, 47 S. CAL. L. REV. 476, 483 (1974); Peter N. Spotts & Robert Marquand, *A Lamb Ignites a Debate on the Ethics of Cloning*, CHRISTIAN SCI. MONITOR, Feb. 26, 1997 at 3.

- - - - -End Footnotes- - - - -

Cloning may be an attractive means of creating a child to people in a variety of situations. If one or both members of a couple are infertile, cloning presents one viable reproductive option. n24 If one member of the couple has a genetic disorder that the couple does not wish to pass on to a child, they could clone the unaffected member of the couple. If both husband and wife are carriers of a recessive genetic disease and are unwilling to run the twenty-five percent risk of bearing a child with the disorder, they may seek to clone one or the other of them. n25 This may be [*648] the only way in which the couple will be willing to have a child that will carry on their genetic line.

-----Footnotes-----

n24 See Herbert Wray et al., The World After Cloning, U.S. NEWS & WORLD REP., Mar. 10, 1997, at 59.

n25 See JAY KATZ, EXPERIMENTATION WITH HUMAN BEINGS 977 (1972).

-----End Footnotes-----

Even people who could reproduce coitally may desire to clone for a variety of reasons. People may want to clone themselves, deceased or living loved ones, or individuals with favored traits. A wealthy childless individual may wish to clone himself or herself to have a genetic heir or to pass on control of a family business. Parents who are unable to have another child may want to clone their dying child. n26

-----Footnotes-----

n26 See Willard Gaylin, The Frankenstein Myth Becomes Reality -- We Have the Awful Knowledge to Make Exact Copies of Human Beings, N.Y. TIMES, Mar. 5, 1972, @ 6 (Magazine), at 12. This is not dissimilar to a present situation in which a couple whose daughter died is making arrangements to have her cryopreserved in vitro embryo implanted in a surrogate mother in an attempt to carry out her wish to provide grandchildren. See Gina Kolata, Medicine's Troubling Bonus: Surplus of Human Embryos, N.Y. TIMES, Mar. 16, 1997, at 1; Fox on Trends (Fox Television Broadcast, Mar. 19, 1997).

-----End Footnotes-----

People might wish to clone individuals with desired traits, such as Mother Teresa, Michael Jordan, or Michelle Pfeiffer. Less well-known individuals could also be cloned for specific traits, such as a high pain threshold or resistance to radiation. n27 Those who can perform a particular job well, like soldiers or athletes, might also make good candidates. n28 One biologist even suggested cloning legless men for the low gravitational field and cramped quarters of a space ship. n29

-----Footnotes-----

n27 See J.B.S. Haldane, Biological Possibilities for the Human Species in the Next Thousand Years, in MAN AND HIS FUTURE 337, 355 (Gordon Wolstenholme ed., 1963), cited in Pizzulli, supra note 23, at 490 n.66.

n28 See Joseph Fletcher, Ethical Aspects of Genetic Controls, 285 N. ENG. J. MED. 776, 779 (1971), cited in Pizzulli, supra note 23, at 490 n.67.

n29 See Haldane, supra note 27, at 354, cited in Pizzulli, supra note 23, at 520 n.235.

-----End Footnotes-----

Clones could be created to donate non-essential organs like kidneys or bone marrow. n30 John Fletcher, former bioethicist at the National Institutes of

Health, argues, "the reasons for opposing this are not easy to argue." n31 Going further with this idea, John Robertson advocates cloning a "back up supply of embryos from which tissue or organs could be obtained if a tragedy befell a first child." n32

- - - - -Footnotes- - - - -

n30 See Jeffrey Kluger, Will We Follow the Sheep?, TIME, Mar. 10, 1997, at 66, 70.

n31 Id. (quoting John Fletcher).

n32 John Robertson, Address to the National Bioethics Advisory Commission (Mar. 14, 1997), available at <<http://www.all.org/nbac/70313b.htm>> [hereinafter Robertson statement].

- - - - -End Footnotes- - - - -

Cloning also broadens the options available to non-traditional family units. Clone Rights United Front, a group of gay activists based in New York, demonstrated against the proposed New York legislation that [*649] would ban nuclear transplantation research and human cloning because they see human cloning as a significant breakthrough for same-sex reproduction. n33 Randolfe Wicker founded the Clone Rights United Front in order to pressure legislators not to ban human cloning research because he sees nuclear transplantation cloning as an inalienable reproductive right. n34 Wicker stated, "I realize my clone would be my identical twin, and my identical twin has a right to be born." n35

- - - - -Footnotes- - - - -

n33 See Anita Manning, Pressing a "Right" to Clone Humans, Some Gays Foresee Reproduction Option, USA TODAY, Mar. 6, 1997, at 1D.

n34 See id; see also Liesl Schilinger, Postcard from New York, INDEPENDENT (London), Mar. 16, 1997, at 2 (discussing the Clone Rights United Front demonstrations in New York to dissuade New York legislators from passing a bill that would make human cloning research a felony).

n35 Manning, supra note 33, at 1D (quoting Wicker).

- - - - -End Footnotes- - - - -

Ursula Goodenough, a cell biologist from Washington University, raised an additional application of cloning -- reproduction without men. n36 If females cloned themselves, men would be superfluous in reproduction, leading to a world where men may eventually be phased out entirely -- the ultimate feminist utopia. n37 Ann Northrop, a columnist for the New York gay newspaper, LGNY, says that cloning is enticing to lesbians because it offers them a means of reproduction and "has the potential of giving women complete control over reproduction." n38 "This is sort of the final nail in men's coffins. . . . Men are going to have a very hard time justifying their existence on this planet, I think. Maybe women may not let men reproduce." n39

-----Footnotes-----

n36 See J. Madeline Nash, *The Age of Cloning*, TIME, Mar. 10, 1997, at 62, 64.

n37 See, e.g., CHARLOTTE PERKINS GILMAN, HERLAND (1979). Immediately after the announcement of Dolly's birth, commentators discussed the implications of "virgin birth," or of a woman giving birth to her twin. See Nash, *supra* note 36, at 64.

n38 Manning, *supra* note 33, at 1D (quoting Northrop).

n39 Schilinger, *supra* note 34, at 2 (quoting Northrop).

-----End Footnotes-----

B. The Potential Physical Risks in Cloning Humans

Many scientists, including Dolly's creators, are concerned that it would be premature to begin human cloning without first addressing the many safety concerns through animal research. n40 National Institutes of Health Director Harold Varmus, testifying before Congress, specifically raised the concern that animal cloning technology is not scientifically ready to be applied to human cloning research, even if it were permitted, [*650] because there are technical questions which can only be answered by continued animal research. n41 Of 277 attempts in the sheep cloning experiment, only one -- Dolly -- survived. n42

-----Footnotes-----

n40 See Paul Recer, *Sheep Cloner Says Cloning People Inhumane -- Senator Disagrees*, ASSOCIATED PRESS POL. SERV., Mar. 13, 1997, available in 1997 WL 2508493 (reporting testimony of Dr. Ian Wilmut and of Dr. Harold Varmus before the Senate, Mar. 12, 1997, regarding the banning of human cloning research).

n41 See *id.*

n42 See Wilmut et al., *supra* note 4, at 811.

-----End Footnotes-----

Reactivating the genes of a cell is risky. An adult cell which has already been differentiated contains a complete complement of genes, but only a small proportion are activated in order to do the specialized task of that cell. Activating the slumbering genes may reveal hidden mutations. Mutations are "a problem with every cell, and you don't even know where to check for them," according to Ralph Brinster of the University of Pennsylvania. n43

-----Footnotes-----

n43 Begley, *supra* note 3, at 59.

-----End Footnotes-----

Moreover, some differentiated cells rearrange a subset of their genes. For example, immune cells rearrange some of their genes to make surface molecules. n44 Such rearrangement could cause problems for the resulting clone. Also, if all the genes in the adult DNA are not properly reactivated, there could be a problem for the clone at a later developmental stage. n45 The high rate of laboratory deaths suggests that cloning may in fact damage the DNA of a cell, and scientists urge that Dolly should be closely monitored for abnormal genetic anomalies that did not kill her as a fetus but may have long-term harmful effects. n46

- - - - -Footnotes- - - - -

n44 See Tilghman, *supra* note 21.

n45 See *id.*

n46 See Nash, *supra* note 36, at 65; see also Spotts & Marquand, *supra* note 23, at 3.

- - - - -End Footnotes- - - - -

Furthermore, because scientists do not fully understand the cellular aging process, they do not know what "age" or "genetic clock" Dolly inherited. n47 On a cellular level, when the report of her existence was published in *Nature*, was she a normal seven month old lamb, or was she six years old (the age of the mammary donor cell)? There is speculation that Dolly's cells most likely are set to the genetic clock of the nucleus donor, and therefore are comparable to those of her six year old progenitor. n48 One commentator stated that if the hypotheses of a cellular, self-regulating genetic clock were correct, clones would be cellularly programmed to have much shorter life spans than the "original." n49 This could seriously undermine many of the benefits which [*651] have been set forth in support of cloning and lead people to view cloned animals and humans as short-lived, disposable copies. This concern for premature aging has lead Dr. Sherman Elias, geneticist and obstetrician at the Baylor College of Medicine, to call for further animal testing of nuclear transplantation as a safeguard to avoid subjecting human clones to premature aging and the potential harms associated with aged cells. n50

- - - - -Footnotes- - - - -

n47 See Terence Monmaney, *Prospect of Human Cloning Gives Birth to Volatile Issues*, L.A. TIMES, Mar. 2, 1997, at A1.

n48 See *id.*; see also *Whatever Next?*, ECONOMIST, Mar. 1, 1997, at 79, 79-80.

n49 See *Hello Dolly*, ECONOMIST, Mar. 1, 1997, at 17 (discussing the pros and cons of aging research which could result from nuclear transplantation cloning); see also Monmaney, *supra* note 47 (noting that some biologists have "wondered if the DNA from an aged donor would give rise to a clone with a brand-new lease on life -- or one that was already old, a sort of newborn oldster").

n50 See Monmaney, *supra* note 47.

- - - - -End Footnotes- - - - -

-

The history of animal cloning from embryonic and fetal cells also suggests caution before cloning humans. Early cloning experiments on frogs in the 1950s n51 and 1960s n52 met only with mixed results, sometimes resulting in "grossly . . . genetically deformed adults." n53 More recently, when the Grenada Corporation in Texas began the cloning of cows n54 from differentiated embryonic cells, some of the cloned calves were abnormally large. n55 Some weighed up to one hundred and eighty pounds at birth, more than twice the normal seventy five pound birth weight of this breed. n56 Also, some of these calves were born with diseases such as diabetes and enlarged hearts, and eighteen to twenty percent of these calves simply died after birth. n57

- - - - -Footnotes- - - - -

n51 See Pizzulli, supra note 23, at 484-85.

n52 See Horizon: Dawn of the Clone Age (BBC television broadcast, Sept. 10, 1997), transcript available at <<http://www.bbc.co.uk/horizon/cloneage/trans.shtml>>.

n53 Pizzulli, supra note 23, at 484.

n54 See Horizon, supra note 52.

n55 See id.

n56 See id.

n57 See id.

- - - - -End Footnotes- - - - -

The scientific team that created Dolly has also met with unsatisfactory results. After cloning Dolly, they used fetal cells to create cloned, transgenic animals. n58 In this experiment, the team successfully transferred the DNA from a fetal cell into 425 enucleated sheep eggs. n59 Of these attempted fusions, however, only fourteen resulted in pregnancy and only six lambs were born alive. n60 Labor was artificially induced in all of the surrogate ewes, and in some instances the lambs [*652] were delivered by cesarean section. n61 Some of these cloned lambs weighed nearly twice the average amount. n62

- - - - -Footnotes- - - - -

n58 See Angelika E. Schnieke et al., Human Factor IX Transgenic Sheep Produced By Transfer of Nuclei from Transfected Fetal Fibroblasts, 278 SCIENCE 2130, 2130 (1997). "Transgenic" animals are those that carry and express a gene of another species.

n59 See Cloned Transgenic Lambs Produce Clotting Factor in Milk, BIOTECHNOLOGY NEWSWATCH, Jan. 15, 1998, at 5.

n60 See Schnieke et al., supra note 58, at 2132. This study determined that a "pregnancy" resulted when an embryo continued to develop 60 days after

implantation, which is slightly less than half of this breed of lamb's normal gestational period. See *id.* at 2131-32.

n61 See *id.* at 2132. The fact that some of these lambs were delivered by cesarean section prompted an animal welfare organization, Compassion in World Farming, to criticize the Roslin team for using Scottish Blackface sheep as surrogate ewes because these ewes are typically smaller than the Poll Dorset or 1 which are actually used to create the cloned embryos. See Nick Thorpe, *Scientists Baffled By Oversized Sheep Clones*, SCOTSMAN, July 28, 1997, at 1; see also Steve Connor, "Giant" Lambs Put Future of Cloning in Doubt, SUNDAY TIMES (London), July 27, 1997, at 5.

n62 See Thorpe, *supra* note 61; see also Connor, *supra* note 61.

- - - - -End Footnotes- - - - -

The gross deformities and early deaths among cloned animals raise concerns that initial trials in human nuclear transplantation will also meet with disastrous results. n63 Dr. Wilmut is specifically concerned with the ethical issues raised by any such defective births. n64 He responded to the announcement that Dr. Richard Seed intended to clone human beings within the next two years by stating: "Let me remind you that 1/4 of the lambs born in our experiment died within days of birth. Seed is suggesting that a number of humans would be born but others would die because they didn't properly develop. That is totally irresponsible." n65 Dr. Wilmut noted further that "with people, the possibility of 276 failures, many of which would involve miscarriages, sounds horrific and raises huge ethical barriers" to the possibility of human cloning in the near future. n66 Roger Pederson, a physician at the University of California, San Francisco, stated that many scientific groups are voluntarily observing a moratorium on human cloning because "the chance of abhorrent offspring is high." n67

- - - - -Footnotes- - - - -

n63 See Pizzulli, *supra* note 23, at 487.

n64 See Recer, *supra* note 40 (quoting Dr. Wilmut as stating, "I don't see any reason why we would want to copy a person. I personally still have not heard of a potential use of this technique to produce a new person that I would find either ethical or acceptable").

n65 Seed's Human Cloning Bid Draws Edgy World Reactions, MEDICAL INDUSTRY TODAY, Jan. 8, 1998, available in LEXIS, News Library, Curnws File (quoting Dr. Wilmut).

n66 Cloning: Scientist's Plan to Clone Human Sparks Outrage, HEALTH LINE, Jan. 8, 1998, available in LEXIS News Library, Medical & Health Materials File (quoting Wilmut).

n67 David Kestenbaum, Cloning Plan Spawns Ethics Debate, 279 SCIENCE 315, 315 (1998) (quoting Pederson).

- - - - -End Footnotes- - - - -

C. The Potential Psychological Impacts of Cloning

Concerns about the psychological impact of cloning focus on the parent/child relationship, the undermining of the clone's autonomy and [*653] free will, and the later-born twin's loss of ability to control private information.

The unique origins of a clone might create unreasonable expectations about her. When a clone is created from a dead child, the parents might expect the second child to be a replacement for the first. The similar physical appearance of the second child will bring to life the ghost of the first, perhaps underscoring expectations that the children will be identical in behavior and personality. But the clone will invariably be different. The parents will be older -- even if just by a few years -- than they were when rearing the first child. They will also have suffered an indelible grief, the death of their child, and thus may have a tendency to overprotect the clone. They may also narrow the experiences of the clone, exposing it only to the type of food, toys, or classes that the first child liked.

These two problems -- the specter of difference, leading to disappointment, and the narrowing of experiences -- are likely to haunt all cloning arrangements. Consider, for example, what might happen if a couple cloned a famous basketball player. n68 If the clone breaks his knee at age ten, would his parents consider him a disappointment? Would he view himself as a failure? "For the clonant to have as his parent the foreknower and creator of every one of his genetic predispositions might well make child adjustment exponentially more difficult." n69

- - - - -Footnotes- - - - -

n68 This is an example provided by Mark Rothstein, Professor, University of Houston Law Center.

n69 Pizzulli, supra note 23, at 510.

- - - - -End Footnotes- - - - -

Family relationships could also be altered by the fact that a cloned child may seem more like an object than a person, since he or she is "designed and manufactured as a product, rather than welcomed as a gift." n70 As the NBAC observed, "somatic cell nuclear transfer cloning, some fear, offers the possibility of virtually complete control over one important aspect of a child's development, his or her genome, and it is the completeness of this control . . . [that] invokes images of manufacturing children according to specification." n71 It might diminish the personhood of a clone if he were created to satisfy the vanity of the nucleic DNA donor or to meet the needs of a pre-existing individual, such as a child needing bone marrow. n72 In attempting to cull out from [*654] the resulting child the favored traits of the loved one or celebrity who has been cloned, the social parents might limit the environmental stimuli to which the child is exposed. "Arguably a person cloned from a departed loved one . . . has less chance of being loved solely for his own intrinsic worth." n73

- - - - -Footnotes- - - - -

n70 CLONING HUMAN BEINGS, *supra* note 8, at 52 (citing Gilbert Meilaender, Testimony Before the National Bioethics Advisory Commission, Mar. 13, 1997); see also *id.* at 53 ("The cloning of humans risks transforming children into 'products' of technological achievement rather than 'gifts' created in love.") (citation omitted).

n71 CLONING HUMAN BEINGS, *supra* note 8, at 69.

n72 See CLONING HUMAN BEINGS, *supra* note 8, at 74.

n73 Pizzulli, *supra* note 23, at 503 n.140.

- - - - -End Footnotes- - - - -

Some scientists argue that these concerns are unfounded, because a clone will be invariably different from the original. The NBAC report observes that "the idea that one could make through somatic cell nuclear transfer a team of Michael Jordans, a physics department of Albert Einsteins, or an opera chorus of Pavarottis, is simply false." n74

- - - - -Footnotes- - - - -

n74 CLONING HUMAN BEINGS, *supra* note 8, at 33.

- - - - -End Footnotes- - - - -

However, we are in an era of genetic determinism. James Watson, co-discoverer of deoxyribonucleic acid ("DNA") and the first director of the Human Genome Project, has stated, "we used to think our fate was in our stars. Now we know, in large measure, our fate is in our genes." n75 Harvard zoologist Edward O. Wilson asserts that the human brain is not tabula rasa later filled in by experience, but rather "an exposed negative waiting to be slipped into developer fluid." n76 Genetics are alleged to be so important by some scientists that psychiatrist David Reiss at George Washington University has declared that "the Cold War is over in the nature and nurture debate." n77

- - - - -Footnotes- - - - -

n75 Leon Jaroff, *The Gene Hunt*, TIME, Mar. 20, 1989, at 217.

n76 Tom Wolfe, *Sorry, but Your Soul Just Died*, FORBES ASAP, Dec. 2, 1996, at 210.

n77 Charles C. Mann, *Behavioral Genetics in Transition*, 264 SCIENCE 1686, 1686 (1994).

- - - - -End Footnotes- - - - -

Whether or not genetics actually play such a large role in human development, parents may raise a clone as if they do. After all, regardless of their belief in genetic determinism, the only reason people want to clone (as opposed to adopting or using an egg or sperm donor in the case of infertility) is to assure that a child has a certain genetic make-up. It seems absurd to think that they would forget about that genetic make-up once the clone was born. We already

limit parents' genetic foreknowledge of their children because we believe it will improperly influence their rearing practices. Medical genetics groups often caution parents against having their children tested for late-onset genetic disorders, n78 because a child who tested positive could "grow up in a [*655] world of limited horizons and may be psychologically harmed even if treatment is subsequently found for the disorder." n79

- - - - -Footnotes- - - - -

n78 See American Society of Human Genetics Board of Directors & American College of Medical Genetics Board of Directors, Points to Consider: Ethical, Legal, and Psychological Implications of Genetic Testing in Children and Adolescents, 57 AM. J. HUM. GENETICS 1233, 1236 (1995).

n79 Dorothy Wertz et al., Genetic Testing for Children and Adolescents: Who Decides?, 272 JAMA 875, 878 (1994).

- - - - -End Footnotes- - - - -

Cloning could undermine human dignity by threatening the replicant's sense of self and autonomy. A vast body of developmental psychology research has demonstrated children's need to have a sense of an independent self. n80 This might be difficult for the clone of a parent or of a previous child who died. n81 Even if the clone did not believe in genetic determinism, the original's life "would always haunt the later twin, standing as an undue influence on the latter's life, and shaping it in ways to which others lives are not vulnerable." n82

- - - - -Footnotes- - - - -

n80 See generally Daniel N. Stern, THE INTERPERSONAL WORLD OF THE INFANT (1985).

n81 See CLONING HUMAN BEINGS, supra note 8, at 68 (citing HANS JONAS, PHILOSOPHICAL ESSAYS: FROM ANCIENT CREED TO TECHNOLOGICAL MAN (1974)).

n82 Id. at 67.

- - - - -End Footnotes- - - - -

Clones are very different from naturally-occurring twins. With twins:

Each life begins ignorant of what [the genome's determinative effects] will be, and so remains as free to choose a future as are individuals who do not have a twin. In this line of reasoning, ignorance of the effect of one's genome on one's future is necessary for the spontaneous, free, and authentic construction of a life and self. n83

In fact, some philosophers n84 and lawyers n85 argue that the child has a "right to an open future."

- - - - -Footnotes- - - - -

n83 Id.

n84 See Joel Feinbeberg, *The Child's Right to an Open Future*, in *WHOSE CHILD? CHILDREN'S RIGHTS, PARENTAL AUTHORITY, AND STATE POWER* at 124 (W. Aiken & H. LaFollette, eds., 1980).

n85 See, e.g., Dena S. Davis, *Genetic Dilemmas and the Child's Right to an Open Future*, 28 RUTGERS L.J. 549 (1997).

- - - - -End Footnotes- - - - -

Another problem is that a clone cannot control disclosure of intimate personal information. n86 This may threaten her self-image. n87 Studies of people's responses to genetic testing information show that learning genetic information about oneself (whether it is positive or negative [*656] information) can harm one's self image. n88 Moreover, an individual might be stigmatized or discriminated against based on foreknowledge of her genotype. If an individual were cloned and later died young of an inheritable disease, the clone might suffer from insurance or employment discrimination.

- - - - -Footnotes- - - - -

n86 See Pizzulli, *supra* note 23, at 512.

n87 See *id.* at 514. Pizzulli points out that a person's self-image may be "at odds" with an "objective" description of himself or herself, and that overestimation of abilities might spur one to achieve goals otherwise thought unattainable. See *id.* at 515.

n88 For a review of the studies, see Lori B. Andrews, *Prenatal Screening and the Culture of Motherhood*, 47 HASTINGS L.J. 967 (1996).

- - - - -End Footnotes- - - - -

D. The Potential Societal Impacts of Cloning Humans

The prospect of cloning humans raises several serious concerns about its overall effect on society. Cloning may interfere with evolution, because it promotes genetic uniformity, thus increasing the danger that a disease might arise in the future to which clones would have no resistance. n89 George Johnson, an biologist at Washington University, opposes cloning because "genetic variation is the chief defense our species has against an uncertain future. To strip ourselves of it, even partially, is to endanger our species." n90 Genetic adaptation has allowed the human species to survive; producing genetically identical humans may therefore be threatening to the species. n91 Further, although Dolly the sheep has gotten pregnant, n92 the possibility that human clones would be sterile is another concern. n93 Despite these overall risks, some commentators argue that if human cloning is restricted to very rare cases, then the evolution of the human species should not be stunted nor the human gene pool disturbed any more than the gene pool is currently affected by naturally occurring identical twins. n94

- - - - -Footnotes- - - - -

n89 See George B. Johnson, Editorial, What Rights Should a Cloned Human Have?, ST. LOUIS POST-DISPATCH, Mar. 20, 1997, at B7.

n90 Id.

n91 See Editorial, Genesis the Sequel, NEWSDAY, Mar. 9, 1997, at G1.

n92 See Christy Campbell, Scientist Admits That Dolly May Not Be "Wonder Clone," SUNDAY TELEGRAPH (London), Feb. 22, 1998, at 15.

n93 See Genesis the Sequel, supra note 91.

n94 See Max Bader, Editorial, Threats from Cloning Shouldn't Be Overstated, PORTLAND OREGONIAN, Mar. 9, 1997, at G5 (arguing that as long "as the human gene pool is intact, humans will be able to adapt to the extent that is within their overall makeup to do so").

- - - - -End Footnotes- - - - -

Cloning might also bring detrimental changes to the institution of the family. Boston College theologian Lisa Sowhill Cahill is concerned that cloning may lead to the commodification of human beings and their genes and to the manipulation of human genetics to achieve more socially desirable children. n95 Allen Verhey, a Protestant ethicist at Hope [*657] College in Holland, Michigan, warns that cloning would desensitize society into regarding children as "products." n96 Other opponents envision a world where clones are "cannibalized for spare parts" n97 -- made solely for medical purposes and asked to donate their organs.

- - - - -Footnotes- - - - -

n95 See Kenneth L. Woodward, Today the Sheep . . . , NEWSWEEK, Mar. 10, 1997, at 60.

n96 See id.

n97 Philip Elmer-Dewitt, Cloning: Where Do We Draw the Line?, TIME, Nov. 8, 1993, at 65, 65.

- - - - -End Footnotes- - - - -

Cloning may also have negative impacts on broader legal concepts. Pizzulli points out that:

(a) privacy and autonomy might be severely attenuated in one known by himself or others to have a predetermined genetic identity; and (b) irrespective of personal and/or public knowledge of one's clonal origins, the technology of cloning might have macroeffects upon society by eroding the concept of individuality which is at the core of our notions of privacy and autonomy. n98

In addition to weakening an individual's sense of free will, cloning would "weaken the social constructs and political institutions that serve to foster the exercise of individual autonomy and to inhibit the coercive manipulation of individuals." n99

-----Footnotes-----

n98 Pizzulli, supra note 23, at 498.

n99 Id. at 524-25.

-----End Footnotes-----

II. EXISTING AND PROPOSED LAWS THAT COULD RESTRICT CLONING

There are serious problems with using existing legal authority to govern cloning. There are questions about whether cloning would fall under existing Food and Drug Administration ("FDA") authority and whether it could be regulated by state laws covering embryo research.

A. The Role of the Food and Drug Administration

The FDA recently claimed that it has the power and mechanism to regulate cloning, asserting that the agency's approval is necessary before attempting to clone a human being. n100 The FDA has guidelines covering products that contain cells that have been substantially altered through [*658] "more than minimal" manipulation, n101 such as skin tissue for burn victims. But these may not technically extend to cloning, n102 and even if they do, they do not require prior approval if a patient's cells are being used for his or her own reproductive purposes. n103 The Biotechnology Industry Organization, which represents 750 biotech companies, academic institutions, and state biotechnology centers, supports the FDA's assertion of authority here and is trying to dissuade federal and state lawmakers from enacting moratoria or bans on human cloning. n104

-----Footnotes-----

n100 See Rick Weiss, Human Clone Research Will Be Regulated, WASH. POST, Jan. 20, 1998, at A1.

n101 FDA, PROPOSED APPROACH TO REGULATION OF CELLULAR AND TISSUE-BASED PRODUCTS 6, 9 (1997) [hereinafter FDA GUIDELINES].

n102 For example, if the FDA can regulate cloning, why hasn't it used the same authority to monitor intracytoplasmic sperm injection ("ICSI"), in which DNA (in the form of sperm) is being injected into women's eggs? See FDA GUIDELINES, supra note 101.

n103 See FDA Guidelines, supra note 101, at Table I.

n104 See Biotechnology Industry Organization, There Is No Need for a Rush to Legislate (visited May 30, 1998) <<http://www.bio.org/laws/cloningpaper1.dgw>>. >ENDFN>

B. State Statutes Governing Research on Embryos

The Michigan n105 and California n106 legislatures have passed legislation prohibiting cloning, but other states may assume their bans on embryo research

would apply. Ten states have laws regulating research and/or experimentation on conceptuses, embryos, fetuses, or unborn children that use broad enough language to include early stage conceptuses. n107 It could be argued, however, that these statutes do not cover nuclear transfer cloning.

-----Footnotes-----

n105 See supra note 15 and accompanying text.

n106 See Act of Oct. 4, 1997, 1997 Cal. Stat. 688.

n107 See Fla. Stat. @ 390.0111(5) (1997); La. Rev. Stat. Ann. @ 9:121-:122 (West 1991); Me. Rev. Stat. Ann. tit. 22, @ 1593 (West 1992); Mass. Gen. Laws Ann. ch. 112, @ 12J (West 1996); Mich. Comp. Laws Ann. @ 333.2685 -- .2692 (West 1992); Minn. Stat. @ 145.421 -- .422 (1994); N.D. Cent. Code @ 14-02.2-01 to 14-02.2-02 (1991); N.H. Rev. Stat. Ann. @ 168-B:15 (1994); Pa. Cons. Stat. Ann. @ 3216 (West Supp. 1998); R.I. Gen. Laws @ 11-54-1 (1994).

-----End Footnotes-----

For example, eight of the states prohibit some form of research on some product of conception, referred to in the statutes as a conceptus, n108 embryo, n109 fetus, n110 or unborn child. n111 An argument could be made that [*659] these statutes should not apply to cloning because the experimentation is being done on an egg, not on the product of conception. By the time the egg is re-nucleated, the experiment or research has already been completed. The most protection these statutes would then supply is protection from experimentation after the re-nucleation; these statutes would not prohibit cloning itself. Similarly, two of the ten states define the object of protection -- the conceptus (Minnesota) or unborn child (Pennsylvania) -- as the product of fertilization. n112 If transfer of nucleic material is not considered fertilization, these laws would not apply.

-----Footnotes-----

n108 See Minn. Stat. Ann. @ 145.421 (1994).

n109 See Mich. Comp. Laws Ann. @ 333.2685 -- .2690 (West Supp. 1997).

n110 See Fla. Stat. @ 390.0111(5) (1997); Me. Rev. Stat. Ann. tit. 22, @ 1593 (West 1992); Mass. Gen. Laws Ann. ch. 112, @ 12J (West 1996); Mich. Comp. Laws Ann. @ 333.2685 -- .2690 (West 1992); N.D. Cent. Code @ 14-02.2-01 to 14-02.2-02 (1991); R.I. Gen. Laws @ 11-54-1 (1994).

n111 See 18 Pa. Cons. Stat. Ann. @ 3216 (West Supp. 1998).

n112 See Minn. Stat. Ann. @ 145.421 (1994); 18 Pa. Cons. Stat. Ann. @ 3216 (West Supp. 1998).

-----End Footnotes-----

Not all state statutes suffer from these drafting weaknesses. In New Hampshire, a researched-upon pre-embryo may not be transferred to a uterine cavity. n113 Thus, if a re-nucleated oocyte is considered to be a pre-embryo,

it would be impermissible in New Hampshire to implant the resulting conceptus to create a child. In Louisiana, the statute applies to an "in vitro fertilized human ovum . . . composed of one or more living human cells and human genetic material so unified and organized that it will develop in utero into an unborn child," n114 and an entity meeting this definition cannot be cultured and farmed solely for research purposes. n115 This would prohibit research to study gene function, cellular development, and so forth, if it involved cloning techniques. The law also specifically states, however, that such an entity may be used "solely for the support and contribution of the complete development of human in utero implantation." n116 This creates the anomalous result that researchers could clone a whole individual in Louisiana, but could not do research ex utero on cloned cells.

-----Footnotes-----

n113 See N.H. Rev. Stat. Ann. @ 168-B:15(II). (1994).

n114 La. Rev. Stat. Ann. @ 9:121 (West 1991).

n115 See id. @ 9:122.

n116 Id.

-----End Footnotes-----

In addition to questions of statutory interpretation, the state laws that have general bans on embryo research or experimentation may be challenged as unconstitutionally vague. n117 In *Lifchez v. Hartigan*, for example, a ban on experimentation on embryos was held unconstitutionally vague because it failed to define the terms [*660] "experimentation" and "therapeutic," n118 forcing researchers and clinicians to guess whether their conduct was unlawful and thus violating their Fourteenth Amendment due process rights. n119

-----Footnotes-----

n117 Three states' fetal research bans -- those of Utah, Illinois, and Louisiana -- have already been struck down on those grounds. See *Jane L. v. Bangerter*, 61 F.3d 1493, 1499-1502 (10th Cir. 1995), rev'd on other grounds sub nom. *Leavitt v. Jane L.*, 518 U.S. 137 (1996); *Lifchez v. Hartigan*, 735 F.Supp. 1361, 1364-67 (N.D. Ill. 1990), aff'd mem., 914 F.2d 260 (7th Cir. 1990); *Margaret S. v. Edwards*, 794 F.2d 994, 999 (5th Cir. 1986).

n118 *Lifchez*, 735 F.Supp. at 1364.

n119 See id. at 1364.

-----End Footnotes-----

C. Proposed Federal and State Statutes Regarding Cloning

The announcement of the Dolly experiment led to the immediate introduction of federal and state bills to ban the practice of human cloning. Most do not suffer from the problem of unconstitutional vagueness since the particular activity they ban -- cloning -- is explicitly described. However, cloning is described

in different ways in the various bills, which could lead to definitional problems in scope of application as new variations of the technology are developed that may not exactly fit into the current cloning definitions. In fact, technology has already outpaced some of these bills.

There are seven bills to ban cloning pending in Congress. n120 State bans are under consideration in eighteen states. n121 But many of these proposed laws still suffer from drafting infirmities. For example, five of the states' proposals create a loophole by only prohibiting the creation of a "genetically identical" individual through cloning. n122 Since the current technique uses a donated egg to create the clone, the resulting individual will have some additional mitochondrial DNA from the enucleated egg, so he or she will not be genetically identical to the original individual.

- - - - -Footnotes- - - - -

n120 See supra note 12.

n121 Alabama, Connecticut, Delaware, Georgia, Hawaii, Illinois, Indiana, Kansas, Maryland, Michigan, Minnesota, Mississippi, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, South Carolina, Tennessee, Virginia, and Wisconsin. See supra note 13; infra Appendix, Table 2.

n122 Illinois, Kansas, New York, South Carolina, and Tennessee. See infra Appendix, Table 2.

- - - - -End Footnotes- - - - -

Only two states, California and Michigan, have actually passed bans on cloning. n123 The California law, however, may soon be outpaced because of the rapid advances in cloning technology. The law prohibits transferring the nucleus from a human cell into a human egg cell. n124 But, in January 1998, scientists at the University of Wisconsin revealed that cow eggs could serve as incubators for nucleic DNA of other mammalian species. n125 The California law as well as proposed laws in [*661] ten of the eighteen states that also prohibit cloning using human eggs n126 could be evaded by making a human clone via somatic cell DNA transfer into an enucleated cow egg. In contrast, the Michigan law prohibits human cloning utilizing a human or non-human egg. n127

- - - - -Footnotes- - - - -

n123 See supra notes 14-15 and accompanying text.

n124 See Act of Oct. 4, 1997, @ 5, 1997 Cal. Stat. 688.

n125 See Robert Lee Hotz, Cow Eggs Used as Incubator In Cloning Boon, L.A. TIMES, Jan. 19, 1998, at A1.

n126 Connecticut, Illinois, Minnesota, Mississippi, New Hampshire, New York, Ohio, Pennsylvania, Rhode Island, and Tennessee. See infra Appendix, Table 2.

n127 See Act of June 3, 1998, 1998 Mich. Pub. Acts 108, bill text available in Westlaw, at 1997 MI H.B. 864 (SN), which prohibits "transferring the nucleus of a human somatic cell into an egg cell from which the nucleus has been

removed or rendered inert."

- - - - -End Footnotes- - - - -

III. WOULD A BAN ON CLONING INFRINGE UPON A CONSTITUTIONAL RIGHT OF SCIENTIFIC INQUIRY?

If Congress (or a state) were to adopt a ban on human cloning, one possible constitutional challenge would be that the law unduly interferes with a right of scientific inquiry. In fact, Senator Tom Harkin has defended cloning research on these grounds, stating that there are no "appropriate limits to human knowledge. None, whatsoever. . . . To my friends Senator Bond and President Clinton who are saying 'Stop, we can't play God,' I say 'Fine. Take your ranks alongside Pope Paul V, who in 1616 tried to stop Galileo.'" n128

- - - - -Footnotes- - - - -

n128 Sheryl Stolberg, Sheep Clone Researcher Calls for Caution Science, L.A. TIMES, Mar. 13, 1997, at A18 (quoting Harkin).

- - - - -End Footnotes- - - - -

Although there is no specifically enumerated right to research in the U.S. Constitution, certain commentators argue that support for such a right could be derived from the Fourteenth Amendment right to personal liberty n129 and the First Amendment right to free speech. n130 Further, there [*662] is no doubt that scientific inquiry has been an enduring American value. The framers of the Constitution discussed the sacred nature of scientific inquiry. n131 The Constitution authorized the establishment of a system of patents to promote scientific invention. n132 Historically, scientific theories have been protected because of the great social import the United States places on the "sanctity of knowledge and the value of intellectual freedom." n133

- - - - -Footnotes- - - - -

n129 See Richard Delgado & David R. Millen, God, Galileo, and Government: Toward Constitutional Protection for Scientific Inquiry, 53 WASH. L. REV. 349, 394-99 (1978) (arguing that scientific inquiry may be protected by substantive and procedural due process); see also June Coleman, Comment, Playing God or Playing Scientist: A Constitutional Analysis of Laws Banning Embryological Procedures, 27 PAC. L.J. 133, 1367-68 (1996). But see John Robertson, The Scientist's Right to Research: A Constitutional Analysis, 51 S. CAL. L. REV. 1203, 1214 (1977) (concluding that the Court is unlikely to identify scientific research as a fundamental right protected by the Fourteenth Amendment).

n130 See id. at 1212. June Coleman argues that "various Supreme Court decisions, read together, seem to acknowledge a freedom to conduct research which is anchored in the freedom of speech." Coleman, *supra* note 129, at 1387; see also Roth v. United States, 354 U.S. 476, 484 (1957) (noting that the Continental Congress cited scientific advancement as a reason for protecting freedom of the press); Sweezy v. New Hampshire, 354 U.S. 234, 250 (1957) (noting that "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"); Ira H. Carmen, Should Human Cloning Be Criminalized?,

13 J.L. & POL. 745, 752 (1997). Carmen suggests that even if cloning is not protected by the Fourteenth Amendment's protection of procreative liberty, cloning is likely to be protected by the First Amendment. Carmen writes: "Replication may not be reproduction, but in many contexts it is scientific inquiry, perhaps even pure research. Scientific inquiry, including genetic engineering, implicates First Amendment freedom of expression values."

n131 See Gary L. Francione, *Experimentation and the Marketplace Theory of the First Amendment*, 136 U. PA. L. REV. 417, 428-29 (1987).

n132 See U.S. CONST. art. I, @ 8, cl. 8 (granting to Congress the power "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").

n133 See Coleman, *supra* note 129, at 1387.

- - - - -End Footnotes- - - - -

This right to research consists of the freedom to pursue knowledge. n134 The strongest claims have been made for a First Amendment right of scientific inquiry. The Supreme Court in *Branzburg v. Hayes* n135 specifically analogized the information function performed by academic researchers to that performed by the press. If the First Amendment protects a marketplace of ideas, it seems likely that it would protect the generation of information that will be included in the marketplace. n136 Indeed, the Court's jurisprudence has protected activity under this theory in a variety of settings, such as the financing of s[ci] ch n137 and the gathering of news. n138

- - - - -Footnotes- - - - -

n134 See Robertson, *supra* note 129, at 1204.

n135 408 U.S. 665, 705 (1972).

n136 See Coleman, *supra* note 129, at 1386-87.

n137 See *Buckley v. Valeo*, 424 U.S. 1 (1976).

n138 See *Branzburg*, 408 U.S. at 681-82 (dictum).

- - - - -End Footnotes- - - - -

There is also extensive discussion in dicta of a right of inquiry. The Court stated in *Meyer v. Nebraska* n139 that the right to liberty guaranteed by the Fourteenth Amendment encompasses the freedom to "acquire useful knowledge . . . and generally to enjoy those privileges long recognized at common law as essential to the orderly pursuit of happiness by free men." n140 A federal district court similarly suggested [*663] that scholars have a right "to do research and advance the state of man's knowledge." n141

- - - - -Footnotes- - - - -

n139 262 U.S. 390 (1923).

n140 Id. at 399.

n141 Henley v. Wise, 303 F. Supp. 62, 66 (N.D. Ind. 1969).

- - - - -End Footnotes- - - - -

But what does that "right" consist of? Scientists have a right of access to existing information. For example, that federal court suggested in dicta that obscenity laws could not be applied to prohibit the Kinsey Institute from studying obscene materials. n142 However, courts have held there is no fundamental right of scientific inquiry to undertake experiments -- in particular, to conduct research on fetuses. n143

- - - - -Footnotes- - - - -

n142 See id. at 67.

n143 See Margaret S. v. Edwards, 488 F. Supp. 181, 220-21 (E.D. La. 1980) ["Margaret S. I"]; see also Margaret S. v. Treen, 597 F. Supp. 636, 674 (E.D. La. 1984), aff'd sub nom. Margaret S. v. Edwards, 794 F.2d 994 (5th Cir. 1986) ["Margaret S. II"]; Wynn v. Scott, 449 F. Supp. 1302, 1322 (N.D. Ill. 1978), aff'd sub nom. Wynn v. Carey, 599 F.2d 193 (7th Cir. 1979).

- - - - -End Footnotes- - - - -

Cloning is sufficiently analogous to embryo research that restrictions on it should not be considered protected by a right of scientific inquiry. In holding that the right to conduct medical research is not fundamental under the Constitution, a federal court held that a state could regulate experimentation involving the unborn so long as the regulation was rational. The court explained, in words that are particularly applicable to cloning, "given the dangers of abuse inherent in any rapidly developing field, it is rational for a State to act to protect the health and safety of its citizens." n144

- - - - -Footnotes- - - - -

n144 Margaret S. I, 488 F. Supp. at 221.

- - - - -End Footnotes- - - - -

Even if cloning research on humans were protected by the Constitution, certain restrictions would be permissible. The freedom to pursue knowledge is distinguishable from the right to choose the method for achieving that knowledge, which may permissibly be regulated to some extent. n145 Although the government may not prohibit research in an attempt to prevent the development of new knowledge, it may restrict or prohibit the means used by researchers that threaten interests in which the state has a legitimate concern. n146 Research may be restricted, for example, to protect the subject's right to autonomy and welfare by requiring informed, free and competent consent. n147

- - - - -Footnotes- - - - -

n145 See Robertson, *supra* note 129, at 1204-07.

n146 See *id.* at 1253.

n147 See *id.* at 1256.

- - - - -End Footnotes- - - - -

Therefore, federal and state government may regulate the researcher's methods in order to protect the rights of research subjects and community safety. As the NBAC report points out:

[*664] Because science is both a public and social enterprise and its application can have profound impact, society recognizes that the freedom of scientific inquiry is not an absolute right and scientists are expected to conduct their research according to widely held ethical principles. There are times when limits on scientific freedom must be imposed, even if such limits are perceived as an impediment by an individual scientist. n148

- - - - -Footnotes- - - - -

n148 CLONING HUMAN BEINGS, *supra* note 8, at 6.

- - - - -End Footnotes- - - - -

IV. WOULD A BAN ON CLONING INFRINGE UPON THE RIGHT TO MAKE REPRODUCTIVE DECISIONS?

A variety of personal desires may motivate people to utilize cloning. n149 The NBAC report suggests it would be "understandable, or even, as some have argued desirable," n150 to create a child from one adult if both members of the couple have a lethal recessive gene; from a dying infant if his father is dead and the mother wants an offspring from her late husband; or from a terminally ill child to create a bone marrow donor. n151 Some of the experts testifying before the NBAC also suggested that cloning should be appropriate in exceptional circumstances. Rabbi Dorff opined that it would be "legitimate from a moral and a Jewish point of view" to clone a second child to act as a bone marrow donor so long as the "parents" raise that second child as they would any other. n152 Rabbi Tendler raised the scenario of a person who was the last in his genetic line and whose family was wiped out in the Holocaust. "I would certainly clone him," said Tendler. n153 In contrast, the Catholic viewpoint is that cloning "is entirely unsuitable for human procreation even for exceptional circumstances." n154

- - - - -Footnotes- - - - -

n149 See *supra* Part I.

n150 CLONING HUMAN BEINGS, *supra* note 8, at 79.

n151 See *id.* at 80.

n152 Id. at 55 (citation omitted).

n153 Id. at 55. For other Jewish support for cloning, see Peter Hirschberg, *Be Fruitful and Multiply and Multiply and Multiply*, JERUSALEM REP., Apr. 16, 1998, at 32, 32-36.

n154 CLONING HUMAN BEINGS, *supra* note 8, at 55.

- - - - -End Footnotes- - - - -

The right to make decisions about whether or not to bear children is constitutionally protected under the constitutional right to privacy n155 and the constitutional right to liberty. n156 The Supreme Court in 1992 reaffirmed the "recognized protection accorded to liberty relating to [*665] intimate relationships, the family, and decisions about whether or not to beget or bear a child." n157 Early decisions protected a married couple's right to privacy to make procreative decisions, but later decisions focused on individuals' rights as well: "If the right of privacy means anything, it is the right of the individual, married or single, to be free from unwarranted governmental intrusion into matters so fundamentally affecting a person as the decision whether to bear or beget a child." n158

- - - - -Footnotes- - - - -

n155 See *Griswold v. Connecticut*, 381 U.S. 479 (1965).

n156 See, e.g., *Planned Parenthood v. Casey*, 505 U.S. 833 (1992).

n157 Id. at 857.

n158 *Eisenstadt v. Baird*, 405 U.S. 438, 453 (1972).

- - - - -End Footnotes- - - - -

A federal district court has indicated that the right to make procreative decisions encompasses the right of an infertile couple to undergo medically-assisted reproduction, including in vitro fertilization and the use of a donated embryo. *Lifchez v. Hartigan* n159 held that a ban on research on fetuses was unconstitutional not only because it was impermissably vague, but also because it impermissibly infringed upon a woman's fundamental right to privacy. n160 Although the Illinois statute banning embryo and fetal research at issue in the case permitted in vitro fertilization, it did not allow embryo donation, embryo freezing, or experimental prenatal diagnostic procedures. The court stated: "It takes no great leap of logic to see that within the cluster of constitutionally protected choices that includes the right to have access to contraceptives, there must be included within that cluster the right to submit to a medical procedure that may bring about, rather than prevent, pregnancy." n161

- - - - -Footnotes- - - - -

n159 735 F. Supp. 1361 (N.D. Ill. 1990), *aff'd mem.*, 914 F.2d 260 (7th Cir. 1990).

n160 See Lifchez, 735 F. Supp. at 1376-77.

n161 Id. at 1377 (citations omitted). The court also held that the statute was impermissibly vague because of its failure to define "experiment" or "therapeutic." See id. at 1376.

- - - - -End Footnotes- - - - -

Using similar logic, some commentators argue that the Constitution also protects the right to create a child through cloning. As Pizzulli points out, "in comparison with the parent who contributes half of the sexually reproduced child's genetic formula, the clonist is conferred with more than the requisite degree of biological parenthood, since he is the sole genetic parent." n162

- - - - -Footnotes- - - - -

n162 Pizzulli, supra note 23, at 550 n.357.

- - - - -End Footnotes- - - - -

John Robertson argues that cloning is not qualitatively different from the practice of medically assisted reproduction and genetic selection that is currently occurring. n163 Consequently, he argues that [*666] "cloning . . . would appear to fall within the fundamental freedom of married couples, including infertile married couples to have biologically related offspring." n164 Similarly, June Coleman argues that the right to make reproductive decisions includes the right to decide in what manner to reproduce, including reproduction through, or made possible by, embryo cryopreservation and twinning. n165 This argument could also be applied to nuclear transplantation by saying that a ban on cloning as a method of reproduction is tantamount to the state denying one's right to reproductive freedom.

- - - - -Footnotes- - - - -

n163 See Robertson Statement, supra note 32. This seems to be a reversal of Robertson's earlier position that cloning "may deviate too far from prevailing conception of what is valuable about reproduction to count as a protected reproductive experience. At some point attempts to control the entire genome of a new person pass beyond the central experiences of identity and meaning that make reproduction a valued experience." John A. Robertson, CHILDREN OF CHOICE: FF EDOM AND THE NEW REPRODUCTIVE TECHNOLOGIES 169 (1994).

n164 Robertson Statement, supra note 32.

n165 See Coleman, supra note 129, at 1364.

- - - - -End Footnotes- - - - -

However, cloning is too qualitatively different from normal reproduction and from the types of assisted reproduction protected by the Lifchez case to simply assume the same Constitutional protections apply. As George Annas suggests, "this change in kind in the fundamental way in which humans can 'reproduce' represents such a challenge to human dignity and the potential devaluation of human life (even comparing the 'original' to the 'copy' in terms of which is

to be more valued) that even the search for an analogy has come up empty handed." n166

-Footnotes-

n166 Scientific Discoveries in Cloning: Challenges for Public Policy: Hearing Before the Subcomm. on Public Health and Safety of the Senate Comm. on Labor and Human Resources, 105th Cong. 44 (1997) (statement of George Annas).

-End Footnotes-

Cloning is not a process of genetic mix, but of genetic duplication. In even the most high-tech reproductive technologies available, a mix of genes occurs to create an individual with a genotype that has never before existed on earth. Even in the case of twins, their futures are unknown and the distinction between the offspring and their parents is acknowledged. n167 In the case of cloning, however, the genotype in question has already existed. Even though it is clear that a clone will develop into a person with different traits because of different social, environmental, and generational influences, there is strong speculation that the fact that he or she has a genotype that already existed will affect how the resulting clone is treated by himself, his family, and social institutions. n168

-Footnotes-

n167 Gilbert Meilaender, testifying before the NBAC, pointed out the social importance of children's genetic independence from their parents: "They replicate neither their father nor their mother. That is a reminder of the independence that we must eventually grant to them and for which it is our duty to prepare them." CLONING HUMAN BEINGS, supra note 8, at 67 (quoting Meilaender).

n168 See supra Part I.

-End Footnotes-

[*667] Just as in the scientific inquiry context, even if a fundamental constitutional right to clone were recognized, any legislation that would infringe unduly upon this right would be permissible if it were narrowly tailored to further a compelling state interest. n169 As demonstrated by the discussion in Part I, the potential physical and psychological risks of cloning an entire individual are sufficiently compelling to justify banning the procedure. Further, the notion of replicating existing humans seems to fundamentally conflict with our legal system, which emphatically protects individuality and uniqueness. n170

-Footnotes-

n169 See Roe v. Wade, 410 U.S. 113, 155 (1973).

n170 See Tony Mauro, Sheep Clone Prompts U.S. Panel Review, USA TODAY, Feb. 25, 1997, at A1.

-End Footnotes-

-

Some commentators argue that the potential harm to the cloned child should not matter because the child would not have been born otherwise and thus cloning is beneficial to that child. n171 But there are obviously some harms that are worse than non-existence, as courts recognize in wrongful life cases. n172 If this were not the case, any amount of pain and suffering could be inflicted on a child, so long as the parents claimed they would not have given birth to him otherwise. n173

- - - - -Footnotes- - - - -

n171 This is an argument made by John Robertson. See CLONING HUMAN BEINGS, supra note 8, at 65-66.

n172 See, e.g., Curlender v. Bio-Science Laboratories, 165 Cal. Rptr. 477 (Ct. App. 1980).

n173 See CLONING HUMAN BEINGS, supra note 8, at 66.

- - - - -End Footnotes- - - - -

Similarly, it has been argued that, because the risk of physical harm of cloning is no different from risks with normal reproduction from certain genetic disorders, cloning should not be restricted any more than other forms of reproduction. n174 This analogy is not apt, though. Parents might conceive a child who was unable to walk due to the genetic anomaly of spina bifida. But if they intervened with a child, by beating her, and caused the same result, the moral analysis would be much different. To the extent that cloning is a purposeful intervention that causes harm, it should be viewed differently from traditional reproduction.

- - - - -Footnotes- - - - -

n174 See id. at 65 (citing Dan W. Brock, Cloning Human Beings: An Assessment of Ethical Issues Pro and Con (1997) (paper commission by NBAC)).

- - - - -End Footnotes- - - - -

The government could also assert a compelling interest in protecting against broader social harms. For example, the government could assert an interest in preserving evolution and thus forbid cloning because it could lessen diversity in society. n175 The government may also assert an [*668] interest in diversity as a cultural good independent of its value for evolution. n176

- - - - -Footnotes- - - - -

n175 See Pizzulli, supra note 23, at 557. "Large-scale cloning of a limited number of genotypes would decrease the adaptive potential of man." Id. at 560.

n176 See id. at 559.

- - - - -End Footnotes- - - - -

Cloning a whole individual whose genetic constitution is known in advance may create a form of "genetic bondage" n177 that runs afoul of the U.S. Constitution's Thirteenth Amendment prohibition on slavery. n178 To the extent that a cloned individual would be limited in his or her freedom based on expectations about his or her genetic makeup, cloning can be seen as creating a badge of slavery. n179 Intentionally producing people whose genetic predispositions are known undermines their free will, and courts have held that infringement on free will and civil liberty may be prohibited by the Thirteenth Amendment. n180

-----Footnotes-----

n177 This useful term was introduced by Francis Pizzulli. See Pizzuli, *supra* note 23, at 481.

n178 Under the Thirteenth Amendment of the U.S. Constitution, "neither slavery nor involuntary servitude, except as punishment for crime whereof the party shall have been duly convicted, shall exist within the United States, or any place subject to their jurisdiction." U.S. CONST. amend. XIII, @ 1.

n179 See Pizzulli, *supra* note 23, at 515.

n180 See *id.* at 516-22. Bans or restrictions on cloning would be justifiable where the government could prove that cloning is inconsistent with the notion of free will, and that such an erosion of the free will would result in grave societal harms. See *id.*

-----End Footnotes-----

Additionally, the creation of persons to be used as "spare parts" for transplantation would not only be socially repugnant, n181 but might be violative of the clone's Thirteenth Amendment rights against involuntary servitude. n182 The clone's right to bodily integrity and personal property are also violated by the notion of spare organ part banking. n183

-----Footnotes-----

n181 Cf. Kluger, *supra* note 30, at 70 (quoting NIH Director Harold Varmus' contention that cloning a person is "repugnant to the American public").

n182 See Pizzulli, *supra* note 23, at 525-28.

n183 See *id.*

-----End Footnotes-----

Francis Pizzulli points out that a ban on cloning individuals might be constitutional if it were not based on a religious rationale but on "the valid secular purpose of safeguarding a normative view of human identity," resting upon the personal privacy and individual autonomy values of the Thirteenth and Fourteenth Amendments. n184 "Implicit in the prohibition of clonal humans is the rationale that certain types of humans ought not to exist, either because they have inalienable rights to nonexistence or because their presence would erode important social values." n185

-----Footnotes-----

n184 Pizzulli, *supra* note 23, at 583.

n185 *Id.* at 493.

-----End Footnotes-----

Some commentators argue that potential psychological and social harms from cloning are too speculative to provide the foundation for a [*669] governmental ban. Elsewhere, I have argued that speculative harms do not provide a sufficient reason to ban reproductive arrangements such as in vitro fertilization or surrogate motherhood. n186 But the risks of cloning go far beyond the potential psychological risks to the original whose expectations are not met by the clone, or the risks to the child of having an unusual family arrangement if the original was not one of his or her rearing parents.

-----Footnotes-----

n186 See Lori B. Andrews, *Surrogate Motherhood: The Challenge for Feminists*, 16 L., MED. & HEALTH CARE 72 (1988).

-----End Footnotes-----

The essential difference with cloning is the risk of hubris, of abuse of power. Cloning represents the potential for "abuses of the power to control another person's destiny -- both psychological and physical -- of an unprecedented order." n187 A Pizzulli suggests, legal discussions of whether the replicant is the property of the cloned individual, the same person as the cloned individual, or a resource for organs all show how easily the replicant's own autonomy can be swept aside. n188

-----Footnotes-----

n187 Pizzulli, *supra* note 23, at 492.

n188 See *id.*

-----End Footnotes-----

In that sense, maybe the best analogy is cloning is incest. Arguably, reproductive privacy and liberty are threatened as much by a ban on incest as by a ban on cloning. Arguably the harms are equally speculative. Yes, incest creates certain potential physical risks to the offspring, due to the potential for lethal recessive disorders. But no one seriously thinks that this physical risk is the reason we ban incest. A father and daughter could avoid that risk by contracepting or agreeing to have prenatal diagnosis and abort the affected fetuses. There might even be instances in which, because of their personalities, there is no psychological harm to either party. Yet we ban incest -- despite the speculative nature of the harm -- because it allows an exercise of excessive power of parents over children.

V. THE FEDERAL ROLE IN REGULATING CLONING

Because both President Clinton and various members of Congress have expressed concerns about human cloning -- as have many members of the public -- federal action is being considered to ban the practice. Such action would raise important questions of federalism and might be challenged as exceeding the federal government's authority. However, a close analysis of U.S. Supreme Court cases regarding federal powers provides justification for federal action in this area.

The states, rather than the federal government, have traditionally regulated issues related to health care. Physicians and hospitals are [*670] licensed and regulated by state boards of medical examiners. Thus, at first glance, it would seem that cloning would be more appropriately regulated at the state level. However, despite this tradition of decentralization, the federal government may justify regulation of human cloning by linking such regulation to its spending power n189 and/or its power to regulate interstate commerce. n190

-----Footnotes-----

n189 See U.S. CONST. art. I, @ 8, cl. 1.

n190 See id. cl. 3.

-----End Footnotes-----

The federal government currently regulates a variety of medical and scientific activities that are linked to government funding. In conjunction with its provision of Medicare funds, the federal government has required physicians to abide by certain regulations, such as those prohibiting certain forms of fraud and abuse. n191 Similarly, as a condition of receiving federal funds for scientific research, scientists must comply with federal regulations governing research. n192 A federal ban on human cloning research using federal funds, as the President has already promulgated, is also a permissible exercise of federal spending power. n193

-----Footnotes-----

n191 See, e.g., 42 U.S.C. @ 1395nn(b)(2)(B) (1994).

n192 See 45 C.F.R. @@ 46.202-.211 (1997).

n193 See Transcript of Clinton Remarks on Cloning, supra note 7.

-----End Footnotes-----

However, regulation based on the spending power is insufficient to reach research in the private sector, conducted with non-governmental funds or at institutions that do not receive federal funding. To be permissible, federal regulation of private research must be justified under the Commerce Clause.

When Congress regulates medical and scientific activities pursuant to its Commerce Clause power, it often includes a jurisdictional element -- a provision in the statute which indicates that it applies only to activities involving

interstate commerce. n194 If a federal ban on cloning were enacted, a clinic in a particular state might claim that it was operating entirely intrastate and thus the prohibition, as applied to the clinic, exceeded Congress' authority under the Commerce Clause. To analyze whether such an argument would prevail, it is necessary to assess the factors that influence whether intrastate activities are found to have an impact on interstate commerce.

-Footnotes-

n194 One example is the National Organ Transplant Act which provides, in part, that "it shall be unlawful for any person to knowingly acquire, receive, or otherwise transfer any human organ for valuable consideration for use in human transplantation if the transfer affects interstate commerce." 42 U.S.C. @ 274e(a) (1994).

-End Footnotes-

In *United States v. Darby*, n195 the Court upheld the Fair Labor Standards Act stating:

[*671] The power of Congress over interstate commerce is not confined to the regulation of commerce among the states. It extends to those activities intrastate which so affect interstate commerce or the exercise of the power of Congress over it as to make regulation of them appropriate means to the attainment of a legitimate end, the exercise of the granted power of Congress to regulate interstate commerce. n196

The federal government has thus been found to have power to regulate intrastate commerce when supplies moved in interstate commerce, n197 and when customers came from out of state. n198

-Footnotes-

n195 312 U.S. 100 (1941).

n196 *Id.* at 118.

n197 See, e.g., *Daniel v. Paul*, 395 U.S. 298, 305, 308 (1969) (holding that an Arkansas amusement facility isolated on a country road nonetheless affected interstate commerce because a substantial portion of the food served at the snack bar moved in interstate commerce, as did the "sources of entertainment," which included paddle boats leased from an Oklahoma company and a juke box that was manufactured out of state and played records manufactured out of state.)

n198 See, e.g., *Heart of Atlanta Motel, Inc. v. United States*, 379 U.S. 241, 255-56 (1964).

-End Footnotes-

In assessing whether cloning done within one state has an impact on interstate commerce, the first question is whether cloning is, in fact, commerce. Medicine initially was viewed as an altruistic, non-commercial endeavor. Hospitals were charitable institutions for the poor and were exempt from various rules that governed businesses. For example, tort suits against

hospitals were prohibited on the ground of charitable immunity. n199 In recent years, hospitals have taken on more of the characteristics of business, characterized by revenues and expenditures in the millions of dollars. n200 The characterization of hospitals as businesses has justified the extension of such federal regulatory schemes as the Fair Labor Standards Act, n201 the National Labor Relations Act, n202 and the Sherman Act n203 to hospitals. Each of those acts specifically states that it applies only to interstate [*672] commerce. n204 Cases upholding the application of these regulatory schemes to hospitals reason that the purchase of medicine and supplies from out-of-state sources and reimbursement from out-of-state insurance companies and the federal government are sufficient to establish a substantial effect on interstate commerce. n205

- - - - -Footnotes- - - - -

n199 This changed in 1957 in the landmark case *Bing v. Thunig*, 143 N.E.2d 3 (N.Y. 1957).

n200 See Kenneth R. Wing & Andrew M. Sifton, *Constitutional Authority for Extending Federal Control over the Delivery of Health Care*, 57 N.C. L. REV. 1423, 1470 (1979).

n201 29 U.S.C. @ 203(s)(1)(B) (1994) (establishing minimum wage and working condition requirements for certain defined employers engaged in interstate commerce).

n202 29 U.S.C. @ 152(14) (1994) (imposing collective bargaining requirements on ployers engaged in interstate commerce).

n203 15 U.S.C. @@ 1-7 (1994).

n204 See 29 U.S.C. @ 203(b) (1994) (FLSA); 29 U.S.C. @ 152(6) (1994) (NLRA); 15 U.S.C. @ 12 (1994) (Sherman Act).

n205 See, e.g., *Summit Health, Ltd. v. Pinhas*, 500 U.S. 322 (1991) (holding jurisdictional element of Sherman Act satisfied because ophthalmological services affects interstate commerce because physicians and hospitals serve nonresident patients, they receive Medicare payments, and peer review proceedings routinely distributed across state lines affect doctors' employment opportunities throughout the Nation); *Hospital Bldg. Co. v. Trustees of Rex Hosp.*, 425 U.S. 738 (1976) (holding hospital had sufficient nexus with interstate commerce to invoke federal jurisdiction of Sherman Act).

- - - - -End Footnotes- - - - -

Providers challenging the federal regulation of cloning may argue that they provide their services for purely altruistic purposes -- creation of organs, reproductive options -- rather than economic gain. When the Repository for Germinal Choice in Escondido, California (the Nobel Prize Sperm Bank) was founded, sperm were provided without charge to women due to the owner's interest in attempting to upgrade the intelligence of the next generation. n206 A similar entity could be established to allow people to raise clones of talented individuals. The Supreme Court has held, however, that an organization does not have to be a commercial enterprise to affect interstate commerce. n207

-Footnotes-

n206 See Lori Andrews, Inside the Genius Farm, PARENTS, Oct. 1980, at 80, 81-83.

n207 See National Org. of Women, Inc. v. Scheidler, 510 U.S. 249, 256-61 (1994); United States v. Wilson, 73 F.3d 675 (7th Cir. 1995), cert. denied, 117 S. Ct. 47 (1996).

-End Footnotes-

What if it were alleged that cloning did not have a substantial impact on interstate commerce? Such an argument has already been made in the medical setting, when individual dentists challenged the application of Title III of the Americans with Disabilities Act n208 to their practices as unconstitutional under the Commerce Clause, arguing that their practices occurred entirely intrastate. n209 The U.S. Court of Appeals for the First Circuit held:

If the Defendant's purchase of supplies and equipment from out of state, receipt of payments from out of state insurers and credit card companies, and attendance of classes and conferences out of state by themselves do not substantially affect interstate commerce . . . those commercial activities, taken [*673] together with the activities of other dentists similarly situated, have an effect on interstate commerce substantial enough to fall within the reach of congressional authority under the Commerce Clause. n210

The court's conclusion has been read to mean that "there is little doubt that health care providers are subject to the congressional commerce authority and, therefore, the Congress can opt to impose regulatory controls or federal policy conditions on the activities of those providers" n211

-Footnotes-

n208 42 U.S.C. @@ 12101-12213 (1994).

n209 See Abbott v. Bragdon, 912 F. Supp. 580, 592-94 (D. Me. 1995), aff'd, 107 F.3d 934 (1st Cir. 1997); United States v. Morvant, 898 F. Supp. 1157 (E.D. La. 1995).

n210 Abbott, 912 F. Supp. at 593.

n211 Wing & Siltan, supra note 200, at 1471.

-End Footnotes-

Recent cases challenging the constitutionality of the Freedom of Access to Clinic Entrances Act ("FACE") n212 provide further precedent for suggesting that cloning clinics would be considered to have a substantial impact on interstate commerce. FACE prohibits the physical obstruction, injury or interference "with any person because that person is or has been . . . obtaining or providing reproductive services." n213 Cases sustaining the constitutionality of the Act under the Commerce Clause have held that the provision of reproductive health services substantially affects interstate commerce based on the following congressional findings: (1) "reproductive health facilities acquire

FOCUS

'equipment, medicine, medical supplies, surgical instruments and other necessary medical products . . . from other states;" (2) "individuals travel interstate to obtain and provide reproductive services;" (3) "obstruction of facilities decreases the overall availability of reproductive health services nationwide;" and (4) "obstruction of facilities is a nationwide problem that is beyond the control of individual states." n214 Because FACE regulates a commercial activity that substantially affects interstate commerce, as supported by congressional findings, it is therefore a legitimate exercise of Congress' commerce power.

n215

-----Footnotes-----

n212 18 U.S.C. @ 248 (1994).

n213 18 U.S.C. @ 248(a)(1) (1994).

n214 United States v. Wilson, 73 F.3d 675, 681-83 (7th Cir. 1995) (quoting S. REP. No. 103-117, at 31 (1993) (alteration in original)) (holding that unique scarcity of certain reproductive health services necessitates substantial interstate travel), cert. denied, 117 S. Ct. 47 (1996); see also Cheffer v. Reno, 55 F.3d 1517 (11th Cir. 1995), at 1520-21.

n215 See Wilson, 73 F.3d at 688; Cheffer, 55 F.3d at 1520-21.

-----End Footnotes-----

Cloning facilities are likely to substantially affect interstate commerce in some of the same ways that the facilities at issue in the FACE cases do. For example, cloning facilities are likely to acquire equipment, medicine, medical supplies, surgical instruments and other [*674] necessary medical products from other states. It is likely that some of the patients coming to cloning clinics will travel interstate. By one estimate, there are only ten labs in the world which are capable of duplicating the Dolly experiment, n216 and, consequently, people in other states would have to cross state lines to obtain the services.

-----Footnotes-----

n216 See Begley, supra note 3, at 55 (using estimate from from Dr. W. Bruce Currie, biologist at Cornell University).

-----End Footnotes-----

A business that hires employees and purchases equipment from out of state, and then brings them in state, is also engaged in interstate commerce. n217 In addition, cloning providers will share information and research findings in a national arena, requiring traveling and attendance at national classes and conferences that may be sufficient to satisfy the "substantially affects" requirement. n218 Furthermore, those human beings who result from cloning will have the right to travel. Finally, cloning is an issue of national concern and in fact state legislatures are urging the federal government to enact a ban.

n219

-----Footnotes-----

n217 See *United States v. Robertson*, 514 U.S. 669 (1995) (interpreting the RICO statute).

n218 A legislative assistant in Senator Glenn's office suggested that the national exchange of research results justifies Congress' authority under the Commerce Clause to regulate the use of human subjects in all research, including those projects that do not receive federal funding. See Interview with legislative assistant, office of Senator John Glenn; see also Human Research Subject Protections Act of 1997, S. 193, 105th Cong. @ 2(a)(11) (stating that human research involves interstate commerce or substantially affects interstate commerce).

n219 See S.J.R. 14, 1997-98 Reg. Sess. (Cal. 1997).

- - - - -End Footnotes- - - - -

Until recently, the Supreme Court endorsed a broad construction of the Commerce Clause. However, in *United States v. Lopez*, n220 the Court held for the first time in close to sixty years n221 that Congress had passed a law that exceeded its authority under the Commerce Clause. In *Lopez*, the Court held that the Gun-Free School Zones Act of 1990, prohibiting the knowing possession of a firearm "at a place that the individual knows, or has reasonable cause to believe, is a school zone," n222 neither "regulated a commercial activity nor contained a requirement that the [*675] possession be connected in any way to interstate commerce." n223 Consequently, the law was struck down as exceeding the federal power to regulate.

- - - - -Footnotes- - - - -

n220 514 U.S. 549 (1995).

n221 See *Carter v. Carter Coal Co.*, 298 U.S. 238 (1936) (holding provisions of the Bituminous Coal Conservation Act of 1935 regarding minimum wages, wage agreements, and collective bargaining in the coal-mining industry unconstitutional on the basis that mining constituted "production" which is an "antecedent" of, not a part of, "commerce").

n222 18 U.S.C. @ 922(q)(1)(A) (Supp. V 1993). The term "school zone" is defined as "in, or on the grounds of, a public, parochial or private school" or "within a distance of 1,000 feet from the grounds of a public, parochial or private school." 18 U.S.C. @ 921(a)(25) (Supp. V 1993).

n223 *Lopez*, 514 U.S. at 551.

- - - - -End Footnotes- - - - -

The activity of cloning is distinguishable from the activities at issue in *Lopez* n224 because it does not affect an area where there is a history of state regulation and where states have regulated extensively. Unlike primary and secondary education, which is provided at a local level, cloning would generally be provided by a limited number of facilities around the country who draw personnel and patients from a national market. In addition, few states have

regulated the conduct of human research. n225 Such research has primarily been funded and regulated at the federal level. In Lopez, more than forty states had already acted to ban the possession of guns on or near school grounds. n226 With respect to cloning, only California and Michigan have legal schemes in place to deal with the issue. n227 In fact, state legislators -- including California's -- have introduced bills calling on the federal government to address the issue. n228 If a federal law were adopted, however, it would be important to provide a sufficient legislative history to indicate how cloning would affect interstate commerce, to establish why cloning is of national importance, and to document state legislative actions specifically asking for the federal government to intervene in this area. The current federal proposals attempt to do this.

-----Footnotes-----

n224 For a more thorough discussion of Lopez and the factors that distinguished it from most Commerce Clause cases, see Deborah Jones Merritt, *Commerce!*, 94 MICH. L. REV. 674 (1995).

n225 See LORI B. ANDREWS, *MEDICAL GENETICS: A LEGAL FRONTIER* 33-34 (1987).

n226 See Lopez, 514 U.S. at 581 (Kennedy, J., concurring).

n227 See supra notes 14-15 and accompanying text. Other states have proposed laws. See supra note 13 and accompanying text.

n228 See, e.g., S.J.R. 14, 1997-98 Reg. Sess. (Cal. 1997).

-----End Footnotes-----

President Clinton's legislative proposal, the Cloning Prohibition Act of 1997, states in the "Findings" section of the proposal that the effect of cloning on interstate commerce is one justification, in addition to safety and ethical concerns, for a federal ban. The bill proposed states that "biomedical research facilities, including those conducting cloning, and reproductive services facilities affect interstate commerce." n229

-----Footnotes-----

n229 Cloning Prohibition Act of 1997, H.R. Doc. No. 105-97 @ 2(c) (1997).

-----End Footnotes-----

Three of the seven federal proposals to ban human cloning would prohibit only the use of federal funding for conducting or supporting human cloning or human cloning research. n230 One of the remaining four [*676] federal proposals explicitly invokes the federal government's power under the Interstate Commerce Clause as a justification for federally prohibiting human cloning, regardless of the funding source. n231 Another bill, which would prohibit human cloning conducted with public or private funds, invokes the Commerce Clause as a justification for the ban in the "Findings" section of the proposal. n232 Only two bills prohibit human cloning regardless of the funding source without invoking the Commerce Clause at all. n233

-----Footnotes-----

n230 See H.R. 3133, 105th Cong. (1998); S. 368, 105th Cong. (1997); H.R. 922, 105th Cong. (1997).

n231 See S. 1601, 105th Cong. (1998), also labeled S. 1599, 105th Cong. (1998).

n232 See S. 1611, 105th Cong. (1998), also labeled S. 1602, 105th Cong. (1998).

n233 See S. 1574, 105th Cong. (1998); H.R. 923, 105th Cong. (1997).

- - - - -End Footnotes- - - - -

VI. CONCLUSION

In May of 1971, Dr. James Watson, the Nobel Prize winner for codiscovering the structure of DNA, authored the seminal article for *The Atlantic* called *Moving Toward the Clonal Man*. n234 He explained how cloning could be done and he tried to alert ethicists and scientists that the realization that human cloning was "a matter far too important to be left solely in the hands of the scientific and medical communities." n235 When President Clinton assigned the task of making recommendations about cloning to the National Bioethics Advisory Commission, he noted that "any discovery that touches upon human creation is not simply a matter of scientific inquiry, it is a matter of morality and spirituality as well." n236

- - - - -Footnotes- - - - -

n234 James D. Watson, *Moving Toward the Clonal Man*, *ATLANTIC*, May 1971, at 50.

n235 *Id.* at 53.

n236 Transcript of Clinton Remarks on Cloning, *supra* note 7.

- - - - -End Footnotes- - - - -

The cloning procedure presents numerous physical and psychological risks to the resulting offspring. Only three state statutes -- the California and Michigan bans and the New Hampshire restriction on implanting embryos created for research purposes n237 -- would currently limit the proposal made by Richard Seed to clone humans. Additional bans on human cloning are being considered at the federal and state level. This article has addressed the potential barriers that may block federal and state attempts to prohibit human cloning such as constitutional challenges based on the Commerce Clause, scientists' right of inquiry, or individuals' or couples' privacy or liberty rights to make reproductive decisions. In each case, it has been shown that human cloning could permissibly be restricted based on compelling potential harms to the clone or to the society as a whole.

- - - - -Footnotes- - - - -

n237 See supra note 113 and accompanying text.

- - - - -End Footnotes- - - - -

[*677] APPENDIX

Table 1: Proposed Federal Cloning Bills

	EHLERS H.R. 922 3/10/97	EHLERS H.R. 923 3/10/97	BOND S. 368 3/3/97	CLINTON H. DOC. No. 105-97 6/10/97
Prohibits somatic cell nuclear transfer to create human beings	X	X	X	X
Specifically prohibits making "genetically identical" being				
Specifically prohibits conspiracy to clone a human being				
Specifically prohibits purchase or sale of ovum, zygote, embryo, or fetus for purposes of cloning a human being				
Could be read to ban embryo splitting		X		
Could be read to ban cloning from an embryo	X	X	X	X
Could be read to ban injecting human ova cytoplasm into human egg				
Could be read to ban transferring DNA into nonhuman cells		X	X	X
Bans research on cloning human beings				
Bans cloning of tissues or molecules				
Bans use of private or public funds for cloning		X		X
Bans only use of public funds for cloning	X		X	
Specifically protects biomedical research				X
Specifically excludes IVF and other ARTs not intended to produce a genetically identical human being				
Civil penalties imposed		X		X
Criminal penalties imposed				
Licensure penalties imposed				
Sunset clause				X
Establishes review body that reports to legislature				X

STEARNS HR 3133 1/30/98	CAMPBELL S 1574 1/28/98
-------------------------------	-------------------------------

Prohibits somatic cell nuclear transfer to create human beings

Specifically prohibits making "genetically identical" being

Specifically prohibits conspiracy to clone a

X

X

human being

Specifically prohibits purchase or sale of
ovum, zygote, embryo, or fetus for
purposes of cloning a human being

Could be read to ban embryo splitting

Could be read to ban cloning from an
embryo

X X

Could be read to ban injecting human ova
cytoplasm into human egg

Could be read to ban transferring DNA
into nonhuman cells

X X

Bans research on cloning human beings

Bans cloning of tissues or molecules

Bans use of private or public funds for
cloning

X

Bans only use of public funds for cloning

X

Specifically protects biomedical research

X

Specifically excludes IVF and other ARTs

not intended to produce a genetically

identical human being

Civil penalties imposed

X

Criminal penalties imposed

Licensure penalties imposed

Sunset clause

Establishes review body that reports to

legislature

X *

-----Footnotes-----

* National Science Foundation shall enter into an agreement with the National
Research Council for a review of the implementation of the Act.

-----End Footnotes-----

[*679]

FEINSTEIN	LOTT et al.
S 1611 --	S 1601 --
2/5/98	2/4/98
S 1602 --	S 1599 --
2/9/98	2/5/98

Prohibits somatic cell nuclear transfer to
create human beings

X X

Specifically prohibits making "genetically
identical" being

Specifically prohibits conspiracy to clone a
human being

Specifically prohibits purchase or sale of
ovum, zygote, embryo, or fetus for
purposes of cloning a human being

Could be read to ban embryo splitting

Could be read to ban cloning from an

embryo

X *** X

Could be read to ban injecting human ova
cytoplasm into human egg

Could be read to ban transferring DNA

		FOCUS
into nonhuman cells		
Bans research on cloning human beings	X	X
Bans cloning of tissues or molecules		
Bans use of private or public funds for cloning		
Bans only use of public funds for cloning	X	X
Specifically protects biomedical research	X	X
Specifically excludes IVF and other ARTs not intended to produce a genetically identical human being		
Civil penalties imposed	X	X
Criminal penalties imposed		X
Licensure penalties imposed		
Sunset clause	X	
Establishes review body that reports to legislature	X **	X

-----Footnotes-----

** NBAC.

*** As the term "diploid" is not defined in the statutory language, it could be read to prohibit cloning embryo cells.

-----End Footnotes-----

[*680]

Table 2: Proposed and Active State Cloning Bills

Prohibits somatic cell nuclear transfer to create human beings	AL1, AL2, CT, DE, HI, IL1, IL2, KS, MD1 *, MD2 *, MN, MS, NH1, NH2, NJ, NY1, NY2, NY3, NY4, NY5, OH1, OH2, PA, RI1, RI2, RI3, SC, TN1, TN2, VA
Specifically prohibits making "genetically identical" being	IL1, KS, NY1, RI2, RI3, SC, TN2
Specific ban of conspiracy to clone a human being	MS, NJ ***, NY1, NY2, NY4, SC, TN2
Specifically prohibits purchase or sale of ovum, zygote, embryo, or fetus for purposes of cloning a human being	IL2, MN, MS, NH1, NH2, NY3, OH1, OH2, PA, RI1, TN1
Could be read to ban embryo splitting **	MD1, NJ, NY1, RI2, RI3, SC, TN2
Could be read to ban cloning from an embryo	AL1, AL2, DE, HI, IL2, KS, MD1, MN, MS, NH1, NH2, NJ, NY1, NY3, NY4, NY5, OH1, OH2, PA, RI1, RI2, RI3, SC, TN1, TN2, VA
Could be read to ban injecting human ova cytoplasm into human egg	none
Could be read to ban transferring DNA into nonhuman cells	AL1, AL2, DE, HI, KS, MD1, MD2, NJ, NY1, NY4, SC, TN2, VA
Bans research on cloning human beings	KS, MD1, MD2, NY4
Bans cloning of tissues or molecules	none
Bans use of private or public funds for cloning	AL1, AL2, CT, DE, HI, IL1, IL2, KS, MN, MS, NH1, NH2, NJ, NY1, NY2, NY3, NY4, NY5, OH1, OH2, PA, RI1, RI2, RI3, SC, TN1, TN2, VA

FOCUS

Bans only use of public funds for cloning	MD1, MD2
Specifically protects biomedical research	CT, DE, HI, NY2, NY4, NY5, OH1, OH2, PA, RI2, RI3
Specific ban of IVF and other ARTs not intended to produce a genetically identical human being	CT, IL1, MN, NY2, NY5, RI2, RI3
Civil penalties imposed	CT, DE, IL2, MS, NH1, NH2, NY3, NY5, OH1, OH2, PA, RI1, RI2, RI3, TN1, VA
Criminal penalties imposed	AL1, AL2, CT, HI, IL1, IL2, KS, MN, MS, NJ, NY1, NY2, NY4, SC, TN2
Licensure penalties imposed	CT, IL2, MN, NH1, NH2, NY4, OH1, PA
Sunset clause	DE, IL2, NH1, NH2, NY3, NY5, OH1, OH2, RI2, RI3
Establishes review body that reports to legislature	IL2, NH1, NH2, NY3, NY5, OH1

[*681]

Key to Table 2 Abbreviations:

AL1:	S.B. 511, 1998 Reg. Sess. (Ala., Mar. 14, 1997)
	S.B. 68, 1998 Reg. Sess. (Ala., Jan. 13, 1998)
AL2:	S.B. 8, 1998 Reg. Sess. (Ala., Jan. 13, 1998)
CT:	H.B. 5475, 1998 Reg. Sess. Gen. Assembly (Conn., Feb. 19, 1998)
DE:	S.B. 241, 139th Gen. Assembly, 2d Sess. (Del., Jan. 22, 1998)
HI:	H.B. 3206, 19th Leg. (Haw., Feb. 2, 1998)
IL1:	H.B. 2235, 90th Gen. Assembly, 1997-98 Reg. Sess. (Ill., Mar. 10, 1997)
IL2:	S.B. 1243, 90th Gen. Assembly, 1997-98 Reg. Sess. (Ill., Jan. 14, 1998)
KS:	H.B. 2846, 77th Leg., 1998 Reg. Sess. (Kan., Feb. 6, 1998)
MD1:	H.B. 932, 1998 Reg. Sess. (Md., Feb. 12, 1998)
MD2:	H.J.R. 11, 1998 Reg. Sess. (Md., Feb. 12, 1998)
MN:	S.B. 2423, 80th Reg. Sess. (Minn., Jan. 26, 1998)
	H.B. 2730, 80th Reg. Sess. (Minn., Jan. 26, 1998)
MS:	H.B. 996, 1998 Reg. Sess. (Miss., Jan. 14, 1998)
NH1:	H.B. 1658, 155th Sess., 2d Year (N.H., Jan. 22, 1998)
NH2:	H.B. 1658, 155th Sess., 2d Year (N.H., Mar. 5, 1998)
NJ:	A.B. 329, 208th Leg. (N.J., Jan. 13, 1998)
	A.B. 2849, 207th Leg. (N.J., Mar. 24, 1997)
NY1:	S.B. 2877, 220th Leg. Sess. (N.Y., Feb. 26, 1997)
NY2:	A.B. 5383, 220th Leg. Sess. (N.Y., Mar. 25, 1997)
	S.B. 2877, 220th Leg. Sess. (N.Y., Mar. 19, 1997)
	S.B. 2877, 220th Leg. Sess. (N.Y., Apr. 28, 1997)
	S.B. 2877, 220th Leg. Sess. (N.Y., Jun. 23, 1997)
NY3:	S.B. 5993, 221st Leg. Sess. (N.Y., Jan. 7, 1998)
NY4:	A.B. 9183, 221st Leg. Sess. (N.Y., Feb. 3, 1998)
NY5:	A.B. 9116, 221st Leg. Sess. (N.Y., Jan. 27, 1998)
OH1:	H.B. 675, 122d Gen. Assembly, 1997-98 Reg. Sess. (Ohio, Jan. 15, 1998)
OH2:	S.B. 218, 122d Gen. Assembly, 1997-98 Reg. Sess. (Ohio, Mar. 24, 1998)
PA:	H.B. 2128, 182d Gen. Assembly, 1997-98 Reg. Sess. (Pa., Jan. 21, 1998)
RI1:	H.B. 7123, 1997-98 Leg. Sess. (R.I., Jan. 9, 1998)
RI2:	H.B. 7123, 1997-98 Leg. Sess. (R.I., Apr. 21, 1998)
RI3:	H.B. 7123, 1997-98 Leg. Sess. (R.I., Apr. 29, 1998)
SC:	H.B. 3617, 112th Gen. Assembly Sess. (S.C., Mar. 11, 1997)
TN1:	S.B. 2208, 100th Gen. Assembly (Tenn., Jan. 15, 1998)
	H.B. 2198, 100th Gen. Assembly (Tenn., Jan. 15, 1998)
TN2:	S.B. 2295, 100th Gen. Assembly (Tenn., Jan. 20, 1998)
	H.B. 2281, 100th Gen. Assembly (Tenn., Jan. 20, 1998)

VA: H.B. 752, 1998 Sess. (Va., Jan. 23, 1998)

FOCUS

- - - - -Footnotes- - - - -

* Does not define "cloning."

** If a somatic cell is defined as a diploid cell, one might argue that that includes embryonic cells.

*** A person who engages in or assists, directly or indirectly, in the cloning of a human being is guilty of a crime in the first degree.

- - - - -End Footnotes- - - - -