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SYMPOSIUM ON CLONING: CLONING POSITION PAPER OF THE IIT
INSTITUTE FOR SCIENCE, LAW AND TECHNOLOGY WORKING GROUP ON
REPRODUCTIVE TECHNOLOGIES *

SEC-NOTE-1:

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SUMMARY:

... One issue under deliberation by the Working Group has been human cloning. ... In the interim, President Clinton issued an executive order banning the use of federal funds for human cloning and asked the private sector to voluntarily refrain from cloning. ... Twenty-seven states have considered banning human cloning, and California, Michigan, and Rhode Island now have laws that ban cloning humans. ... These potential harms are sufficient to support a temporary or a permanent ban on the process of human cloning through somatic cell nuclear transfer. ... If a legislature were to adopt a ban on human cloning, questions would arise as to the constitutionality of the ban. ... The NBAC recommendations left open the possibility of continuing the ban on human cloning based on psychological and social risks. ... The National Bioethics Advisory Commission suggested a time-limited ban on cloning of three to five years, and Senators Feinstein and Kennedy have suggested a ten year ban on human cloning. ... This will put the burden on the proponents of cloning to assure safety and social acceptance before human cloning is undertaken. ... A majority of Working Group members supported a permanent or temporary ban on human cloning. ...

TEXT:

[*87]

PREFACE

Nearly two years ago, the world was shocked by the announcement of Scottish scientist, Ian Wilmut, that a sheep had been cloned by using a mature somatic cell of a ewe. This announcement began a dialogue about the role of technology in society and the proper mechanisms for establishing policy. Since the beginning, the Illinois Institute of Technology's Institute for Science, Law and Technology ("ISLAT") has participated in the dialogue. ISLAT is a center for research on the impact of science, law, and technology and provides a forum to bring academic and public policy specialists together to analyze and develop effective policy. In keeping with this goal, ISLAT appointed a multidisciplinary working group n1 to make policy recommendations for the regulation of assisted reproductive technologies. On December 5, 1997, ISLAT sponsored a symposium on reproductive technology, "Changing Conceptions: How Science and Law are Shaping Future Generations," to inform the Working Group and [*88] other audience members of the practices in this field. The conference consisted of presentations by key researchers from the reproductive sciences, law, anthropology, sociology, psychology, ethics, as well as from providers and consumers. It was at this conference that Richard Seed first announced his plan to clone humans.

One issue under deliberation by the Working Group has been human cloning. Taking into consideration the work done by the National Bioethics Advisory Commission ("NBAC") and proposed state and federal legislation, the Working Group has analyzed the multitude of issues raised by cloning and the risks and benefits of legislating at this time and has developed the following legislative proposal.

I. INTRODUCTION

Shortly after the cloning announcement, nations began to react by renouncing the process. In the United States, several states drafted legislation calling for an immediate ban; at the federal level, the NBAC was asked by President Clinton to evaluate the medical, religious, ethical, legal, and social implications of cloning and make recommendations based on its findings. In the interim, President Clinton issued an executive order banning the use of federal funds for human cloning and asked the private sector to voluntarily refrain from cloning.

In June, 1997 the NBAC issued its report, recommending the passage of a federal law that would, for a period of three to five years, ban the implantation of embryos created through human cloning. President Clinton responded promptly by forwarding a bill to Congress prohibiting the creation of children through cloning for the next five years. The bill was drafted to specifically protect biomedical research at the cellular and molecular levels as well as animal research. The bill has been without sponsors, but over a half dozen bills to ban cloning have been introduced in Congress. Twenty-seven states have considered banning human cloning, n2 and California, Michigan, and Rhode Island now have laws that ban cloning humans. n3 [*89] Many of these proposals suffer from drafting infirmities. Some of the state bills create a loophole by only prohibiting the creation of a "genetically identical" individual through cloning. n4 Since a donated egg is used to create the clone, the resulting individual will have some additional mitochondrial DNA from the enucleated egg, so he or she will not be identical to the original individual. n5

The rationale for the move to ban cloning is the risk of medical and psychological harms to the children that will be created. These potential harms are sufficient to support a temporary or a permanent ban on the process of human cloning through somatic cell nuclear transfer. Moreover, there is increasing societal desire to develop a mechanism for determining how innovative medical techniques should [*90] be introduced, rather than letting market mechanisms alone determine this. n6

II. CONSTITUTIONAL ISSUES RAISED BY A CLONINGBAN

Banning cloning raises the question of whether Congress or state governments have the power to enact such legislation. If a legislature were to adopt a ban on human cloning, questions would arise as to the constitutionality of the ban. Specifically, a question would arise regarding whether scientists have a constitutional right of inquiry that could serve as the basis of a constitutional challenge to such a restriction.

Although there is no specifically enumerated right to research in the U.S. Constitution, scientific inquiry is highly valued. For example, the Constitution established a system of patents to promote scientific invention, n7 and scientific theories have been protected because of the American ethos of the "sanctity of knowledge and the value of intellectual freedom." n8

Certain commentators argue that the First Amendment right to free speech encompasses the right of scientific inquiry. The U.S. Supreme Court, in *Branzburg v. Hayes*, specifically analogized the information function performed by academic researchers to that performed by the press. n9 The U.S. Supreme Court has used the First Amendment to protect the precursors to speech in a variety of settings, n10 such as the financing of political speech n11 and the gathering of news, n12 as necessary precursors to speech itself. There is also extensive discussion in dicta of a right of inquiry. The Supreme Court stated in *Meyer v. Nebraska* n13 that the right to liberty guaranteed by the Fourteenth Amendment encompassed freedom to "acquire useful knowledge ... and generally to enjoy those privileges long recognized [*91] at common law as essential to the orderly pursuit of happiness by free men." n14

However, other court cases holding that there is no constitutional right of medical research specifically reject the idea that a fundamental right of scientific inquiry exists. n15

Even if scientific inquiry was constitutionally protected, certain restrictions would be permissible. Medical research does not occur in any field without restriction. Federal research regulations governing federally funded research do not allow unduly hazardous research procedures, even if the patient consents. The government could regulate to protect against compelling harms (such as the psychological, physical, and social risks of cloning whole individuals), so long as

the regulation is no more restrictive on speech than is necessary to further that interest. Where the government can prove that restrictions on cloning and cloning technology are sufficiently important to the general well-being of individuals or society, such restrictions are likely to be upheld as legitimate, constitutional governmental actions, even if scientists were held to have a First Amendment right of scientific inquiry. n16

If a right to scientific inquiry were rejected, a governmental regulation or ban of such research would not have to have such stringent justification. It would be constitutional so long as it was rationally related to an important governmental purpose. Under such an analysis, a court could uphold restrictions that require that sufficient animal research be done in advance. Moreover, it would be permissible to require the scientists proposing the research to have "the burden of proving that the research is vital, cannot be conducted any other way, and is unlikely to produce harm to society." n17

The recognition of the appropriateness of not undertaking certain medical techniques while their impacts are being considered is evident by the moratorium on germ line gene therapy and the consideration of such a moratorium on xenotransplants.

[*92]

A. Right to Make Reproductive Decisions

Another potential challenge to a ban on cloning could be made based on the constitutional right to make reproductive decisions. The right to make decisions about whether to bear children is constitutionally protected under the constitutional right to privacy n18 and the constitutional right to liberty. n19 The U.S. Supreme Court, in *Eisenstadt v. Baird*, n20 stated, "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." n21

A federal district court has indicated that the right to make procreative decisions encompasses the right to undergo some forms of assisted reproduction. n22 Some legal analysts have suggested that the constitutional right to make reproductive decisions free from unnecessary governmental intrusion covers the decision of a couple to undergo cloning. n23 However, other legal analysts have noted that the unprecedented step of creating a child with only one genetic progenitor would be such a fundamental change in the way humans "reproduce" that it would not be constitutionally protected. n24

The process of cloning is unlike natural or assisted reproduction and the resulting relationship created by cloning is profoundly different than that created through normal reproduction or even than that created through reproductive technologies such as in vitro fertilization, artificial insemination, or surrogate motherhood. In noncloning reproductive technologies, a mix of genes occurs to create individuals with genotypes that have never before existed. These children have open futures, and a distinction clearly exists between them and their genetic progenitors. With cloning, this is not the case. Despite environmental and other influences, which will shape clones into different individuals than their genetic donors, clones may lose the opportunity to have open genetic futures.

[*93] Thus cloning is sufficiently distinct from traditional reproduction or assisted reproduction and should be distinguished from traditional reproductive decisions which are constitutionally protected. Cloning is not reproduction, but a sort of genetic recycling, where a single individual's genome is made into someone else.

Let us assume, though, that courts were willing to make a large leap and find that the constitutional privacy and liberty protections of reproduction encompass cloning. If courts recognized a constitutional right to clone, any legislation that would infringe unduly upon this fundamental right would be subject to a "strict standard" of judicial review. n25 Legislation prohibiting the ability to clone or prohibiting research would have to further a compelling interest in the least restrictive manner possible in order to survive this standard of review. n26

The potential physical and psychological risks of cloning an entire individual are sufficiently compelling to justify banning the procedure. There are many physical risks to the resulting child. Dr. Wilmut, at a recent conference, listed some of them, including miscarriage and death within days of birth. Of 277 attempts, only one sheep lived. The high rate of laboratory deaths may suggest that cloning in fact damages the DNA of a cell.

Genetic anomalies which do not kill cloned fetuses may have long-term harmful effects. n27 If all the genes in the adult DNA are not properly reactivated, there might be a problem at a later developmental stage in the resulting clone. n28 Some differentiated cells rearrange a subset of their genes. For example, immune cells rearrange some of their genes

to make surface molecules. n29 That rearrangement could cause profound physical problems for the resulting clone.

[*94] For example, all of the initial frog cloning experiments succeeded only to the point of the amphibian's tadpole stage. n30 In addition, some of the tadpoles were grossly malformed. n31 Initial trials in human nuclear transplantation could also meet with disastrous results. n32 Ian Wilmut and National Institutes of Health director Harold Varmus, testifying before Congress, specifically raised the concern that cloning technology is not scientifically ready to be applied to humans, even if it were permitted, because there are technical questions that can only be answered by continued animal research. n33 Dr. Wilmut is specifically concerned with the ethical issue which would be raised by any "defective births" which may be likely to occur if nuclear transplantation is attempted with humans. n34

Similarly, mechanisms of aging are unclear and clones may inherit the cellular age of the donor. n35 Thus, Richard Seed's clone may be born with his genetic, cellular age, and may have a shorter life span.

Cloning takes us into a vast unknown in terms of physical risks to the child. We do not even know yet how to scientifically evaluate what the risks will be. The low success rates, problems in abnormal offspring, and potential harm to the child should caution us to pause before cloning at this time.

III. WHEN PHYSICAL RISKS DECLINE

Animal researchers around the world are rushing to try the nuclear transfer technique in a range of species. This may aid in the development of cloning technologies that are less physically risky to [*95] offspring. If cloning appeared to be physically safe and reached a certain level of efficiency, should it then be permissible in humans?

The NBAC recommendations left open the possibility of continuing the ban on human cloning based on psychological and social risks. n36 The notion of replicating existing humans seems to fundamentally conflict with our legal system, which emphatically protects individuality and uniqueness. n37

A clone will lose the ability to control disclosure of intimate personal information. n38 A ban on cloning would "preserve the uniqueness of man's personality and thus safeguard the islands of privacy which surround individuality." n39 Potential employers and health insurers may use genetic information about the nucleus donor to deny benefits to the resulting clones. Even in cases where the donor waives his privacy rights and releases genetic information about himself, the privacy rights of the clone are necessarily implicated due to the fact that the clone possesses the same nucleic genetic code. n40 This runs afoul of principles behind the Fifth Amendment's protection of a "person's ability to regulate the disclosure of information about himself." n41

Developmental psychology research has signaled the need of a child to have a sense of an independent self. A clone may not feel independent but like a replica of the genetic donor, especially if she were the clone of a member of the couple raising her or of a previous child who died. Even with identical twins who are dressed alike and given the same toys to play with, most parents recognize the children's need for individuality. That recognition, though, is less likely to occur when the same genotype is intentionally chosen to carry on the traits of another individual.

If a cloned person's genetic progenitor is a famous musician or athlete, parents may exert an improper amount of coercion to get the child to develop those talents. True, the same thing may happen - to a lesser degree - now, but the cloning scenario is more problematic. A [*96] parent might force a naturally conceived child to practice piano hours on end, but probably will eventually give up if the child seems disinterested or tone deaf. More fervent attempts to develop the child's musical ability will occur if the parents chose (or even paid for) nuclear material from a talented pianist. And pity the poor child who is the clone of a famous basketball player. If he breaks his kneecap at age ten, will his parents consider him worthless? Will he consider himself a failure?

In attempting to cull out from the resulting child the favored traits of the loved one or celebrity who has been cloned, the social parents probably will limit the environmental stimuli to which the child is exposed. The resulting clone may be viewed as being in a type of "genetic bondage" n42 with improper constraints on his or her freedom.

However, the NBAC report refutes this possibility: "Thus 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." n43 And yet we are in an era of genetic determinism, where newspapers daily report the gene for this or that and top scientists tell us that we are a packet of genes unfolding. After all, the one key reason people want to clone is to assure that the child has a certain genetic makeup. Thus, it seems absurd to think they will forget about that genetic makeup once the child comes into being.

Research on the impact of genetic information that demonstrates that a person's genetic foreknowledge about himself or herself (whether negative or positive) can threaten that individual's self-image, harm his or her relationships with family members, and cause social institutions to discriminate against him or her. n44 Thus, parents do not have a right to receive genetic information about their children that is not of immediate medical benefit. The main concern is that a child about whom genetic information is known in advance will be limited in his horizons. A few years ago, a mother entered a Huntington's disease testing facility with her two young children. "I'd like you to test my children for the HD gene," she said. "Because I only have [*97] enough money to send one to Harvard." n45 That request and similar requests to test young girls for the breast cancer gene or other young children for carrier status for recessive genetic disorders raise concerns about whether parents' genetic knowledge about their child will cause them to treat that child differently. A variety of studies have suggested that there may be risks to giving parents such information.

"Planning for the future,' perhaps the most frequently given reason for testing may become 'restricting the future' (and also the present) by shifting family resources away from a child with a positive diagnosis," wrote Dorothy Wertz, Joanna Fanos, and Philip Reilly in an article in the *Journal of the American Medical Association*. n46 Such a child "can grow up in a world of limited horizons and may be psychologically harmed even if treatment is subsequently found for the disorder." n47 A joint statement by the American Society of Human Genetics ("ASHG") and the American College of Medical Genetics ("ACMG") notes, "Presymptomatic diagnosis may preclude insurance coverage or may thwart long term goals such as advanced education or home ownership." n48

Some commentators argue that potential psychological and social harms from cloning are too speculative to provide the foundation for a governmental ban. The risks of cloning go far beyond the potential psychological risks to the original whose expectations are not met in the cloning, or the risks to the child of having an unusual family arrangement if the original was not one of his or her rearing parents.

The risk with cloning is of hubris, of abuse of power. Cloning represents the potential for "abuses of the power to control another [*98] person's destiny – both psychological and physical – of an unprecedented order." n49 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. n50

Despite the fact that risks are speculative – and could be counterbalanced in many cases by other measures – we ban incest because of improper parental power over children. We should ban the creation of human beings through cloning – even if physical safety is established – for that same reason. However, during the time in which a ban is in place, the psychological risks and social harms suggested by cloning can be closely examined and possibly remedied or prevented. Efforts can be undertaken to determine if these harms are inevitable or could be prevented. If these harms are proven to be preventable, the ban can be reconsidered and lifted.

The National Bioethics Advisory Commission suggested a time-limited ban on cloning of three to five years, and Senators Feinstein and Kennedy have suggested a ten year ban on human cloning. If legislation is adopted that has an automatic repeal in ten years, however, serious consideration may not be given to whether there are ways to avoid the physical and psychological risks that would ensue where cloning is undertaken after the automatic ban is lifted. The proposed statute envisions a reconsideration of the ban in ten years, but not an automatic repeal. This will put the burden on the proponents of cloning to assure safety and social acceptance before human cloning is undertaken.

IV. DISSENTING OPINIONS

A majority of Working Group members supported a permanent or temporary ban on human cloning. Two members, though, raised objections to a ban that cannot be ignored and that must be weighed against the reasons in support of such a ban. The first objection raised in the Working Group and echoed in the scientific community is that the benefits of cloning may be underestimated and broad prohibitory legislation would prevent society from availing itself of the benefits offered by cloning. Specifically, if the basis for a ban on creating children is that current scientific evidence shows cloning to be so risky as [*99] not to warrant human experimentation, then the ban's expiration should depend on a showing among scientists that cloning has become sufficiently safe to justify human experimentation and not necessarily the end of an arbitrary time period. By narrowly tailoring legislation, however, and building flexibility into the legislative language it is possible to avoid losing out on those benefits. Benefits may be more slowly recognized, but more safely and cautiously achieved by a shift in the burden of proof. Typically, scientists proceed with their work until or unless it is shown that the work they are doing is unsafe, but what the Working Group hopes a ban will achieve is a shifting of that burden – the process must be shown to be safe before it can be utilized. This shifting of the burden of proof could, for example, be

accomplished by considering a regulatory model such as the one in the United Kingdom, where a governmental oversight body has the authority to license clinics involved in reproductive technologies and assesses what technologies may be safely offered and by whom. A ban would allow the time to set up and implement such an authority.

Another concern raised by banning cloning is one of process – will a ban actually achieve the goal? The purpose of a ban on cloning is to protect the physical and mental health of the participants in cloning including the offspring born through the technique. A wholesale ban on cloning may not achieve the goal in that a black market in cloning may develop. One cannot ignore Richard Seed's determination to move forward with cloning despite a federal ban on funding. The American attitude is one of letting the market determine when reproductive technologies are available.

Once "money talks" it will be difficult to monitor the process. If a black market in cloning develops, it may be difficult, if not impossible, to ensure safety standards are set and maintained. But, the Working Group believes that a ban will mean that fewer people will be exposed to such harms since fewer scientists will participate in the practice. Fewer individuals will be exposed to risks if reputable scientists are involved, but until those risks are known and remedied, a ban is a sensible interim position. Until more is known about the risks and benefits of cloning human beings, it is impossible to develop appropriate recommendations. For example, until the psychological implications of cloning are considered, it is impossible to know what type of counseling, if any, should be recommended for participants.

Finally, the argument is made that a ban is not the appropriate regulatory mechanism to address the concerns raised by cloning. The [*100] argument is that a ban will table democratic deliberation about the appropriateness of human cloning rather than facilitate it because once a ban is in place, political incentive for deliberation and action is removed.ⁿ⁵¹ However, because of the interests of such powerful constituents as the medical and scientific research communities, it is unlikely that the issues of cloning will be relegated to the back burner. Additionally, the NBAC will be continuing to examine the issues raised by cloning and at least five of the proposed state bills provide for the establishment of a multidisciplinary body to consider the implications of cloning and make periodic reports to the legislature.

The purpose of the ban is to allow lawmakers time to develop and implement an appropriate regulatory mechanism which is currently impossible due to the lack of adequate information about both the risks and benefits of cloning. An outright ban will eliminate the need for ad hoc legislative responses and instead facilitate the development of a uniform, flexible, and effective regulatory mechanism.

V. ADDITIONAL ISSUES IF CLONING IS USED

A ban on cloning will make it much less likely that infertile couples and mainstream scientists and clinicians will engage in cloning. If even a small number of clones are created through the black market, however, existing laws would need to be adaptable or refined. For example, the law would need to redefine ideas of parenthood. If an individual created an identical twin, a variety of laws might be applied to determine parenthood – with differing results.

In some states, the clone's legal parents would be the original's parents, and the clone would be the original's sibling. In Arizona and Utah, if a clone were gestated by a surrogate mother, the clone would be considered the legal offspring of the surrogate and her husband, even though she had no genetic connection; the original would be a legal stranger to the child.

Family law, inheritance law, and criminal law might need to be changed if cloning were allowed. We would need laws to prohibit cloning people without their consent. Under current law, people have little control over their biological tissue and genes, once they have been removed from their body. In *Moore v. Regents of the University of California*,ⁿ⁵² the California Supreme Court faced a case in which it was alleged that a patient's doctor, without his knowledge or consent, purportedly used the patient's unique tissue to develop pharmaceutical products worth an estimated \$3 billion. The Court found that, even though the doctor should have informed the patient of what he was planning to do, the patient had no right, as a matter of commercial and property law, to a share of the proceeds because that patient had no property right to his tissue outside of his body.

CONCLUSION

The issues raised by cloning touch on every personal and social construct – physical and mental health, religion, ethics, family building, culture, philosophy, and law to name a few. Every person places a different value on these constructs and the nature of our society respects that individuality, but in order to adequately represent and address the vastly divergent positions on cloning and the value laden questions it raises, it is necessary to take the time to consider these perspectives so

that workable policy can be developed. A ban, such as the one proposed by the Working Group, would allow time to study the myriad implications of cloning so that appropriate and efficacious regulations can be developed and implemented.

FOOTNOTES:

n1. The Working Group includes members with backgrounds in law, medicine, genetics, public health, bioethics and academia, as well as consumers of reproductive technologies.

n2. Alabama, Connecticut, Delaware, Florida, Georgia, Hawaii, Illinois, Indiana, Kansas, Maryland, Michigan, Minnesota, Mississippi, Missouri, New Hampshire, New Jersey, New York, North Carolina, Ohio, Oregon, Pennsylvania, Rhode Island, South Carolina, Tennessee, Virginia, West Virginia, and Wisconsin (see attached chart). Recently, Connecticut also introduced a bill.

n3. See 1997 Cal. Stat. 688; 1998 Mich. Pub. Acts 108-11; and 1998 R.I. Laws Ch. 98-189.

n4. See, e.g., Illinois, Indiana, Kansas, Michigan, New York, Ohio, South Carolina, and Tennessee.

n5. The American Society for Reproductive Medicine ("ASRM") has proposed model cloning legislation. The ASRM heavily lobbied state legislatures to adopt its proposed definitions and "prohibitions" which are drafted in such a way as to be largely protective of certain aspects of cloning while seemingly prohibitive. The controversial positions of the ASRM include (1) defining human cloning in such a manner as to allow certain categories of human cloning, and (2) seeking federal preemption of state laws on human cloning.

The ASRM proposed definitions for "somatic cell" and "somatic cell nuclear transfer," as adopted in the Feinstein/Kennedy bill, S. 1611, are structured so as to permit significant areas of human cloning. The ASRM defines "somatic cell" as "a mature, diploid cell," and "somatic cell nuclear transfer" as "transferring the nucleus of a somatic cell of an existing or deceased human child or adult into an oocyte from which the nucleus or all chromosomes have been or will be removed or rendered inert." The areas of human cloning exempted by the combination of these two definitions include the following:

(a) Cloning from a non-mature, diploid cell, such as a relatively undifferentiated stem cell (e.g., blood and breast tissue stem cells, the latter of which might possibly have been the source of the cell that resulted in the sheep Dolly).

(b) Cloning from a fetal cell, embryonic cell or cell from a post-conception zygote, none of which can be considered cells "of an existing or deceased human child or adult."

(c) Cloning from "aneuploid" cells, that is, abnormal cells containing 45 or 47 or more chromosomes, rather than the normal 46 chromosomes for human non-germ cells.

(d) Perhaps, through ambiguity, cloning from adult human non-germ cells at a stage when they double their normal diploid complement of chromosomes from 46 to 92 chromosomes in preparation for mitosis, the common form of cell division, to the extent such cells might not be considered diploid. Ian Wilmut's method for producing Dolly used donor cells frozen in a cell cycle stage having the diploid number of chromosomes, but that may not turn out to be an essential part of the adult cell cloning technique.

The definitions set forth in the Working Group's proposed Act do not permit such loopholes for human cloning. The NBAC, in finding that current scientific information indicates that the nuclear transplantation technique is not safe to use in humans at this time, thus making it morally unacceptable for anyone to attempt to create a child using the technique, recommended a prohibition against the technique regardless of whether the cell was from an existing or deceased human child or adult, or from a human embryo or fetus. See generally Henry T. Greely, Banning "Human Cloning": A Study in the Difficulties of Defining Science, 8 S. Cal. Interdisc. L.J. 131 (1998).

n6. See Oliver Morton, *First Dolly, Now Headless Tadpoles*, 278 *Science* 798 (1997).

n7. One of the powers of the legislative branch under the patents and copyrights clause of the U.S. Constitution is "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." U.S. Const. Art. I, 8, cl. 8.

n8. See June Coleman, *Playing God or Playing Scientist: A Constitutional Analysis of Laws Banning Embryological Procedures*, 27 *Pac. L.J.* 1331, 1386-87 (1996).

n9. 408 U.S. 665, 705 (1972).

n10. See Coleman, *supra* note 7, at 1338.

n11. See *Buckley v. Valeo*, 435 U.S. 765 (1978).

n12. See *Branzburg*, 408 U.S. at 681-82.

n13. 262 U.S. 390 (1923).

n14. *Id.* at 399.

n15. See *Margaret S. v. Edwards*, 488 F. Supp. 181, 220-221 (E.D. La. 1980). See also *Margaret S. v. Treen*, 597 F. Supp. 636 (E.D. La. 1984), *aff'd sub. nom.*, *Margaret S. v. Edwards*, 794 F.2d 994 (5th Cir. 1986); *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).

n16. See *id.*

n17. These standards were suggested by George Annas in Senate testimony. George Annas, *Testimony on Scientific Discoveries and Cloning: Challenges for Public Policy*, Before the Senate Subcomm. on Labor and Human Relations, 105th Cong., Mar. 12, 1997, at 8.

n18. See, e.g., *Griswold v. Connecticut*, 381 U.S. 379 (1965); *Eisenstadt v. Baird*, 405 U.S. 438 (1972).

n19. See *Planned Parenthood v. Casey*, 505 U.S. 833 (1992).

n20. 405 U.S. 438 (1972).

n21. *Id.* at 453.

n22. See *Lifchez v. Hartigan*, 735 F. Supp. 1361 (N.D. Ill.), *aff'd without opinion, sub nom.*, *Scholberg v. Lifchez*, 914 F.2d 260 (7th Cir. 1990), *cert. denied*, 498 U.S. 1069 (1991).

n23. See John Robertson, *Statement to the National Bioethics Advisory Commission*, Mar. 14, 1997, at 83.

n24. See Annas, *supra* note 20, at 4.

n25. See, e.g., *Griswold v. Connecticut*, 381 U.S. 479 (1965); *Eisenstadt*, 405 U.S. 438; *Roe v. Wade*, 410 U.S. 113 (1973); *Planned Parenthood of Southern Pennsylvania v. Casey*, 505 U.S. 833 (1992).

n26. See *Lifchez v. Hartigan*, 735 F. Supp. 1361 (N.D. Ill.), *aff'd without opinion, sub nom.*, *Scholberg v. Lifchez*, 914 F.2d 260 (7th Cir. 1990), *cert. denied*, 498 U.S. 1068 (1991).

n27. See J. Madeline Nash, *The Age of Cloning*, *Time*, Mar. 10, 1997, at 62-65; see also Peter N. Spotts & Robert Marquand, *A Lamb Ignites a Debate on the Ethics of Cloning*, *Christian Sci. Monitor*, Feb. 26, 1997, at 3.

n28. See Shirley Tilghman, Statement to National Bioethics Advisory Commission, Mar. 13, 1997, at 173.

n29. See *id.* at 147.

n30. See *The Law and Medicine*, *Economist*, Mar. 1, 1997, at 59; 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, 484 (1974) (citing Briggs & King, Transplantation of Living Nuclei from Blastula Cells into Enucleated Frogs' Eggs, 38 *Proc. Nat'l Acad. Sciences* 455 (1952)).

n31. See Pizzulli, *supra* note 30, at 484, 487.

n32. See *id.* at 487.

n33. See Paul Recer, Sheep Cloner Says Cloning People Would Be Inhumane, Associated Press, Mar. 12, 1997 (reporting testimony of Dr. Ian Wilmut and Dr. Harold Varmus before the Senate on March 12, 1997, regarding the banning of human cloning research).

n34. See *id.* (comments of Dr. Ian Wilmut, testifying that as of yet he does not know of "any reason why we would want to copy a person. I personally have still not heard of a potential use of this technique to produce a new person that I would find ethical or acceptable.").

n35. See *Hello Dolly*, *Economist*, Mar. 1, 1997, at 17 (discussion of the pros and cons of aging research which could result from nuclear transplantation cloning); cf. Terence Monmaney, Prospect of Human Cloning Gives Birth to Volatile Issues, *L.A. Times*, Mar. 2, 1997, at A2 (comments of Dr. Elias).

n36. See *Cloning Human Beings: Report and Recommendations of the National Bioethics Advisory Commission 9* (Rockville, Md.: National Bioethics Advisory Commission, June 1997).

n37. See Tony Mauro, Sheep Clone Prompts U.S. Panel Review, *USA Today*, Feb. 25, 1997, at A1.

n38. See Pizzulli, *supra* note 30, at 512.

n39. *Id.*

n40. See *id.*

n41. See Mona S. Amer, Comment, Breaking the Mold: Human Embryo Cloning and Its Implications for a Right to Individuality, *4 UCLA L. Rev.* 1659 (1996).

n42. See Pizzulli, *supra* note 30, at 512.

n43. NBAC Report, *supra* note 36, at 33.

n44. For a review of the studies, see Lori B. Andrews, Prenatal Screening and the Culture of Motherhood, *47 Hastings L.J.* 967 (1996).

n45. Nancy Wexler, Clairvoyance and Caution: Repercussions from the Human Genome Project, in *The Code of Codes: Scientific and Social Issues in the Human Genome Project* 211-243, 233 (Daniel J. Kevles & Leroy Hood eds., 1992).

n46. Genetic Testing for Children and Adolescents: Who Decides?, *272 JAMA* 875, 878 (1994).

n47. *Id.* Similarly, the ASHG/ACMG Statement notes,

Expectations of others for educational, social relationships and/or employment may be significantly altered when a child is found to carry a gene associated with a late-onset disease or susceptibility. Such individuals may not be encouraged to reach their full potential, or they may have difficulty obtaining education or employment if their risk for early death or disability is revealed.

American Society of Human Genetics and American College of Medical Genetics, Points to Consider: Ethical, Legal, and Psychosocial Implications of Genetic Testing in Children and Adolescents, 57 Am. J. Hum. Genetics 1233-1241, 1236 (1995).

n48. 57 Am. J. Hum. Genetics at 1236.

n49. Pizzulli, *supra* note 30, at 497.

n50. See *id.* at 492.

n51. See Susan M. Wolf, Ban Cloning? Why NBAC Is Wrong, *Hastings Ctr. Rep.* 12 (Sept.-Oct. 1997).

n52. 793 P.2d 479 (1980).