FOIA Number: 2013-0365-F

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]: [Texas Law Review - "Liberty, Identity, & Human Cloning" by John A. Robertson] [1]

Stack:	Row:	Section:	Shelf:	Position:
S	115	2	9	3

Texas Law Review

Volume 76, Number 6, May 1998

ARTICLES

NOTES

BOOK REVIEW

Liberty, Identity, and Human Cloning

John A. Robertson*

I. Introduction

The announcement in February 1997 of the birth of Dolly, the sheep cloned from the mammary cells of an adult ewe, was a turning point in ethical and social debates over the use of assisted reproductive technologies. Prior to Dolly, ethical and legal debate focused on the creation and discard of human embryos and on the kinship effects of gamete donation and surrogacy.[1] The birth of Dolly has now shifted the focus of debate to issues of selection and engineering of offspring traits. With rapid advances in knowledge of the human genome and the ability to manipulate genes forthcoming, these issues will occupy debate for some time to come.

The prospect that human cloning might soon follow Dolly brought forth an immediate political reaction. President Clinton declared a ban on the use of federal funds for human cloning research, called for a private sector moratorium on cloning, and asked the National Bioethics Advisory Commission (NBAC) to report in ninety days its recommendations for public policy regarding cloning.[2] Bills banning human cloning or cloning research were introduced in Congress and in several states.[3] In early

---

* Vinson & Elkins Chair in Law, University of Texas School of Law. A.B. 1964, Dartmouth College; J.D. 1968, Harvard University.

1. *See, e.g.*, Johnson v. Calvert, 851 P.2d 776, 787 (Cal. 1993) (holding that a gestational surrogate who carries an implanted zygote containing none of her genetic material to term is not the "natural mother" of the resulting child under California law); Davis v. Davis, 842 S.W.2d 588, 604 (Tenn. 1992) (awarding custody of frozen embryos to the ex-husband after a divorce).

2. *See* Rick Weiss, *Clinton Forbids Funding of Human Cloning Studies: Privately Financed Scientists Urged to Halt Work*, WASH. POST, Mar. 5, 1997, at A10.

3. *See, e.g.*, Human Cloning Prohibition Act, H.R. 923, 105th Cong. § 2 (1997) (providing that "[i]t shall be unlawful for any person to use a human somatic cell for the process of producing a human clone"); Human Cloning Prohibition Act, S. 1601, 105th Cong. § 3 (1997) (stating that "[i]t shall be unlawful for any person or entity, public or private, in or affecting interstate commerce, to use human somatic cell nuclear transfer technology"); *see also* NATIONAL BIOETHICS ADVISORY COMM'N, CLONING HUMAN BEINGS: REPORT AND RECOMMENDATIONS OF THE NATIONAL BIOETHICS ADVISORY COMMISSION 104 tbl.1 (1997) [hereinafter NBAC CLONING REPORT] (outlining bills introduced in 12 states and 3 competing federal bills restricting human cloning).

June, the NBAC recommended enactment of a federal criminal law that banned human cloning for up to five years,[4] and President Clinton promptly submitted the request to Congress.[5] Several foreign countries and national or international advisory bodies also called for a prohibition on human cloning.[6]

Opposing human cloning at this early stage of its development is easy. Nuclear transfer from adult somatic cells has not yet been replicated in other species, much less humans, and initial impressions are that human cloning, if not simply bizarre or hubristic, serves few pressing needs. If the safety and efficacy of cloning are established, however, a persuasive case can be made for its use as a technique to assist infertile or genetically at-risk couples to have healthy children or to procure tissue or organs for transplant. As such, utilization of cloning technology would appear to be part of one's fundamental right to have and rear children.[7] The key ethical, legal, and policy question then posed is whether the use of cloning to achieve these goals presents such special risks or problems that prohibition or close regulation is justified.

Answering this question, however, is not easy. Cloning forces us to rethink in the most basic way the meaning of individuality, personal identity, family, and reproductive liberty. These concepts are well-formed at their core, but they blur at the margins. Reasoning by analogy from core cases can carry one only so far in defining these terms. We must define or create the meaning of these concepts as we apply them in the various situations presented by new reproductive technologies. Human cloning illustrates this dilemma perfectly well. When the risks of cloning are considered and cloning's relation to other practices of assisted reproduction is clarified, we are left, not with a clear answer, but with a constitutive decision as to whether we should view procreative liberty as including techniques of positive genetic selection such as cloning.

Resolving this question is further complicated by the still uncertain role of genes in forming personal identity. Many scientists are committed

4. *See* NBAC CLONING REPORT, *supra* note 3, at 109.

5. President's Remarks Announcing the Proposed "Cloning Prohibition Act of 1997," 33 WEEKLY COMP. PRES. DOC. 844, 844-45 (June 9, 1997) [hereinafter President's Remarks].

6. *See* Opinion of the Group of Advisers on the Ethical Implications of Biotechnology to the European Commission, Ethical Aspects of Cloning Techniques, art. 2(6), (opinion requested by the European Commission on Feb. 28, 1997), May 28, 1997, at 6 (unpublished draft, on file with the *Texas Law Review*); *see also Clinton Seeks to Ban Human Cloning But Not All Experiments*, N.Y. TIMES, June 10, 1997, at C4 (reporting that Britain, Denmark, Germany, Australia, and Spain have banned human cloning). The joint communiqué of the eight-nation economic summit meeting in Denver in June 1997 included an agreement by each country to prohibit human cloning for the creation of children. *See* David S. Cloud, *Achievements at Summit of 8 Often Less Than Meets the Eye*, CHI. TRIB., June 23, 1997, at 4.

7. *See infra* note 248 and accompanying text (discussing the constitutional status of the right to have and rear children).

to uncovering that role, but clear answers are elusive. The desire to clone arises precisely because genes are viewed as highly important, if not crucial, in making people who they are. Assigning significance to genes, however, risks becoming a crude form of genetic essentialism or determinism. At the same time that one grants genes their due, one also must guard against expecting too much from them.

We are thus in a bind: genes count a lot, enough for people to use them in medical and reproductive decisionmaking, yet we simultaneously know that they represent only part of the story. Situations may arise in which replicating an existing genome makes good sense even though we know that genes will not totally replicate the person whose genome is chosen. The temptation is to think that genotype and phenotype will converge even though genes, which explain some of the variance in people, are not the whole story.[8] A clone of *X* may look like *X*, but will not be *X*, although she may be much more like *X* than like *Y*.[9] Coming to terms with the role of genes in our lives, particularly our reproductive lives, is an essential part of the self-defining or self-constitutive process with which cloning and other reproductive technologies now confront us.

To address these issues, we first need to understand what Dr. Ian Wilmut and his colleagues did when they cloned a sheep, the uncertainties that attend further development of cloning, and some of the uses to which the effective cloning of animals and humans could be put. Part II provides this background and also describes the concerns and controversies that the possibility of human cloning has sparked. Part III examines the likely demand for human cloning and how that demand relates to current notions of family and procreative liberty. Part IV addresses the claimed harms of human cloning and assesses whether they provide a sufficient justification for banning those cloning applications that are intimately involved with family choice. Part V considers the public policy issues that arise with cloning at its current, undeveloped stage, and those that would arise once it is established as safe and effective for human use. Part VI discusses the application of these ideas to genetic enhancement and alteration.

II. Science, Potential Uses, and Controversies

"Clone" and "cloning" are originally horticultural terms referring to "a plant group the members of which have been grown from an original

---

8. For example, a recent study of elderly identical twins found that 62% of general cognitive ability was attributable to genetic factors. *See* Gerald E. McClearn et al., *Substantial Genetic Influence on Cognitive Abilities in Twins 80 or More Years Old*, 276 SCIENCE 1560, 1562 (1997).

9. An interesting thought experiment would be to ask what a clone of Jesus Christ would be like if born today, say from DNA recovered from Veronica's sweaty veil or the bloody Shroud of Turin. (I am indebted to Jim Magnuson for this example.) *See generally* NORMAN MAILER, THE GOSPEL ACCORDING TO THE SON (1997) (speculating, in a narrative of historical fiction, as to the thoughts and feelings that Jesus may have had as he walked the earth).

stock, but which do not come from true seed."[10] In biology, it has come to mean the asexual replication of an existing genome or individual, or "a replica of a DNA sequence, such as a gene, produced by genetic engineering."[11] In common parlance, to "clone" means "to make multiple identical copies."[12]

Dr. Ian Wilmut and his colleagues at the Roslin Institute in Scotland took cells from an adult ewe's mammary glands and starved them of nutrients to arrest further cellular development and to restore them to a totipotent state.[13] They then transplanted the nuclei of those cells into enucleated sheep oocytes and applied an electric current to fuse and activate them.[14] Twenty-nine of 277 enucleated eggs developed to the blastocyst stage (11%).[15] Of the twenty-nine blastocysts then placed in the uterus of a female sheep, one (3%) was born, on July 5, 1996.[16] This experiment was the first time that a fully developed animal had been born following transfer of an adult somatic cell nucleus.[17]

Despite this success, one cannot be sure that cloning of sheep or other mammals will quickly become a standard technique. The Wilmut study reports only one successful case out of 277 attempts, with only 29 blastocysts created, and then only one of them successfully brought to term.[18] Indeed, it has not been confirmed that the donor cells used to create the embryo from which Dolly was born were fully differentiated cells and thus had been reprogrammed by starvation as the Wilmut study suggests.[19] Much more work will be necessary to know

---

10. FUNK AND WAGNALLS NEW STANDARD DICTIONARY OF THE ENGLISH LANGUAGE (1919). A more contemporary dictionary has a similar definition: "An organism descended asexually from a single ancestor, such as a plant produced by layering or a polyp produced by budding." THE AMERICAN HERITAGE DICTIONARY OF THE ENGLISH LANGUAGE 359 (3d ed. 1992) [hereinafter AMERICAN HERITAGE DICTIONARY]. Alternative definitions include: "One that copies or closely resembles another, as in appearance or function: *'filled with business-school clones in gray and blue suits.'*" *Id.* (emphasis in original).

11. AMERICAN HERITAGE DICTIONARY, *supra* note 10, at 359.

12. *Id.*

13. The starvation of differentiated cells in order to deprogram them was the conceptual innovation that made nuclear transfer cloning possible. The Wilmut team had demonstrated this technique a year earlier when it had produced two lambs—Megan and Morad—from fetal fibroblastic cells that had their cell cycles reprogrammed in this way. The nuclei had then been removed and inserted in sheep oocytes, activated, and placed in surrogate sheep. Although the report of this study received none of the attention that the birth of Dolly did, it was the scientific breakthrough that made the birth of Dolly possible. *See* GINA KOLATA, CLONE: THE ROAD TO DOLLY AND THE PATH AHEAD 204-08 (1998) [hereinafter KOLATA, CLONE].

14. I. Wilmut et al., *Viable Offspring Derived from Fetal and Adult Mammalian Cells*, 385 NATURE 810, 813 (1997).

15. *See* NBAC CLONING REPORT, *supra* note 3, at 22.

16. *See id.* at 1, 22.

17. Early experiments on frogs had only generated tadpoles. *See id.* at 22.

18. *See* Wilmut, *supra* note 14.

19. *See* Gina Kolata, *Some Scientists Ask: How Do We Know Dolly Is a Clone?*, N.Y. TIMES, July 29, 1997, at C3 (reporting on a few skeptics who are demanding proof that only uncontaminated adult

whether cloning can be replicated in sheep or extended to other mammals.[20]

Other questions exist about the viability of cloning. The phenomenon of genetic imprinting may affect the ability of nuclei from later stages to reprogram cellular development.[21] Also unknown is the extent to which cellular aging will affect the ability of somatic cell nuclei to program normal development once the cell has been reprogrammed to act like a young cell.[22] If age-related effects occur, successful cloning will be limited to cells taken from young DNA. Finally, mutations that have accumulated over time in somatic cells could affect nuclear transfer efficiency and lead to cancer or other diseases in offspring.[23]

Despite these uncertainties, Wilmut's success will spur many scientists to study cloning and the basic processes of cellular development. Already there are other reports of successful cloning driven by the strong financial incentives to produce drugs and biologies through transgenic "pharming" of cows, pigs, or other easily managed species.[24] In one case, clones of rhesus monkey embryos were born after nuclear transfer from undifferentiated embryo cells.[25] Using a variation on the Wilmut method, a Wisconsin company reported pregnancies in cows, but no births from those pregnancies have occurred.[26] Another Wisconsin group reported that it has been able to clone adult cells from five species (sheep, goat, pig, rodent, and monkey) to the embryo level—but not beyond—by placing the

---

udder cells were used, but noting that the vast majority of the scientific community accepts Wilmut's claim). More recently, two noted scientists, in a letter to *Science* also have questioned whether the claim that an adult sheep has been cloned has been proven, pointing out that the cells cloned could have been stem or fetal cells, since the ewe that provided the nuclear DNA was pregnant at the time the mammary cells were taken. *See* Vittorio Sgaramella & Norton D. Zinder, *Letter*, 279 SCIENCE 635, 635 (1998).

20. Many other species (including humans) have shorter gene activation periods than sheep, thus making it more difficult to permit the proper reprogramming of genes after nuclear transfer to allow for subsequent normal development. *See* NBAC CLONING REPORT, *supra* note 3, at 23.

21. Culturing DNA before or after transplant may lead to instability of the imprint, thus limiting the efficiency of nuclear transfer from somatic cells or causing abnormalities in resulting children. *See id.* at 23-24.

22. *See id.* at 24 (explaining that as somatic eggs age and divide, they experience a progressive shortening of the chromosome ends, a determination which may, or may not, be corrected when the adult cell is returned to the egg environment).

23. Gina Kolata, in her useful history of the development of cloning, discounts these arguments as serious objections. *See* KOLATA, CLONE, *supra* note 13, at 239-42.

24. Elizabeth Pennisi, *After Dolly, a Pharming Frenzy*, 279 SCIENCE 646, 646 (1998).

25. *See* Robert Cooke, *Monkeys, Too: Cloning Creates Identical Primates Helpful in Research*, NEWSDAY, Mar. 3, 1997, at A5; Christine Gorman, *Neti and Ditto: Two Cute New Clones Are Too Close for Comfort*, TIME, Mar. 17, 1997, at 60.

26. *See* Gina Kolata, *10 Cloned Cows Soon to Be Born, Company Reports, Duplicating a Lamb Experiment*, N.Y. TIMES, Aug. 8, 1997, at A10. In this case, somatic cells whose growth had been stabilized were fused with enucleated eggs, producing embryos whose cells were then cloned to produce cow pregnancies at a claimed rate of 50% efficiency. *See id.*

deprogrammed nuclei in cow oocytes.[27] The Roslin group has reported successful cloning of sheep from fetal skin cells that had been altered with human genes.[28] Finally, a Massachusetts biotechnology company has cloned calves from the fetal cells of cows, using a variation on the Wilmut technique that appears to be more efficient.[29]

A. Potential Benefits of Cloning

If the Wilmut technique of reprogramming differentiated cells by starvation proves to be a viable method of cloning by nuclear transfer, there will be many potential applications both in animals and humans.

1. Cloning Animals.—Cloning animals would serve many useful purposes and will be the focus of a major biotechnology industry. The immediate driving force at Roslin was to develop more efficient transgenic animals—animals which have been altered by the addition of genes of other species, such as humans.[30] Current methods, which rely on microinjection of the desired DNA into the nucleus of an egg, are both unreliable and inefficient.[31] If foreign DNA, such as a human gene, could be introduced into cell lines in culture, cells expressing the human genes could then be the source of donor nuclei for cloning. All offspring would then express the desired human gene.[32]

Much current attention is now focused on altering the genes of cows or sheep so that they will produce large amounts of pharmaceutically important proteins in their milk, such as insulin or factor VIII to treat hemophilia.[33] Indeed, it is this application which generated the Wilmut study—the desire to make a transgenic sheep that would include human insulin in its milk, thus providing an efficient source of that substance.[34]

---

27. *See* Gina Kolata, *Lab Yields Lamb With Human Gene*, N.Y. TIMES, July 25, 1997, at A18.

28. *See id.*

29. *See* Carey Goldberg & Gina Kolata, *Scientists Announce Births of Cows Cloned in New Way*, N.Y. TIMES, Jan. 21, 1998, at A14. The variation here involved waiting six hours between inserting the nucleus of the cell to be cloned into the enucleated egg and activating it as opposed to immediate activation. With this method, 5-10% of the efforts to create embryos from cloned cells were successful, as compared to the less than 2% success rate in creating embryos in the Dolly experiment when immediate activation occurred.

30. *See* Kolata, *supra* note 27.

31. *See* NBAC CLONING REPORT, *supra* note 3, at 26 (reporting that some injected eggs never develop and those that do produce transgenic animals which fail to express the added gene).

32. The Roslin group has now reported the birth of a transgenic sheep through cloning fetal cells. New genes, including a human gene, were added to laboratory cultures of fetal sheep skin cells. The nuclei of fetal cells that had taken up the human gene were transferred to sheep oocytes and eventually led to the birth of a lamb, Polly. Each of Polly's cells contained the skin cell's genes, including the human gene added in the laboratory. *See* Kolata, *supra* note 27.

33. *See* KOLATA, CLONE, *supra* note 13, at 217-18; Pennisi, *supra* note 24, at 646.

34. *See* NBAC CLONING REPORT, *supra* note 3, at 26 (explaining that the increased efficiency of nuclear transfer technology was the reason for conducting the Dolly experiment).

There is also interest in producing pigs whose genes have been altered to produce a component of the human immune system's regulatory proteins. This would make pig organs more suitable for human transplantation.[35]

Cloning by nuclear transfer could also help generate gene alteration in animals much more efficiently, which would be of great utility for research in genetics and gene therapy.[36] Introducing specific mutations in mice, so-called "knockout mice," has been an important way to study the effects of certain genes.[37] However, producing such animals requires that embryonic stem cells be altered in culture to produce a blastocyst, which is then placed in a surrogate. The resulting chimeric animal must then mate again to produce germline transmission of the altered stem cells. Cloning would allow the genes of large mammals to be altered in this way while expediting the traditionally long generation and litter cycles.

Animal cloning will also help produce genetically identical, homozygous animals to eliminate genetic variation as a confounding variable in experiments.[38] With nuclear transfer cloning, a single blastocyst can be used as the source of donor nuclei for subsequent blastocysts, which in turn can serve as the source of donor nuclei. While the number of possible cycles is limited, nuclear transfer cloning would be an efficient way of producing genetically identical animals for research.[39]

Nuclear transfer cloning might also make it possible to increase the effective output of elite male and female livestock beyond that now achieved by artificial insemination, embryo splitting, and embryo transfer.[40] If the efficiencies of adult nuclear transfer improve significantly, nuclear transfer cloning from somatic cell nuclei could provide additional means for expanding the number of chosen livestock.[41] However, over time there would be an impact on genetic diversity unless efforts were made to ensure a pool of genetically diverse animals for future livestock maintenance.[42]

---

35. *See id.*

36. *See id.* at 27-28 (discussing the potential use of cloning to improve targeted gene alteration).

37. *See, e.g.*, Warren E. Leary, *Gene-Altered Mice are Called First True Sickle Cell Model*, N.Y. TIMES, Oct. 31, 1997, at A20 (announcing the development of transgenic mice carrying the human gene for sickle hemoglobin).

38. *See* NBAC CLONING REPORT, *supra* note 3, at 24-25 (describing the procedure through which cloning could produce "homozygous inbred lines" of animals, but noting that the usefulness of such a procedure for research would likely be "limited" due to its great cost).

39. Such a goal underlies the report from Oregon on the successful nuclear transfer of early embryonic nuclei in rhesus macaque monkeys. *See supra* note 25 and accompanying text.

40. *See* NBAC CLONING REPORT, *supra* note 3, at 25 (contending that artificial insemination and embryo transfer can increase the effective output of elite animals in the livestock industry).

41. Such a goal is driving the research efforts of ABS Global, Inc., whose cloning of cattle from somatic cells was noted above. *See supra* note 26 and accompanying text.

42. Cloning could also help save endangered species. *See* Jon Cohen, *Can Cloning Help Save Beleaguered Species?*, 276 SCIENCE 1320, 1329-30 (1997) (observing that frozen cells banked at the San Diego Zoo could be used to clone a Przewalski's horse, Sumatran rhinoceros, or other rare

Finally, the ability to reprogram cells to allow for the expression of a complete developmental program raises basic issues of cellular development, differentiation, and reactivation that will have far-reaching implications for developmental biology and medicine.[43] This research will provide basic knowledge of how cells grow, divide, and specialize, which could lead to new therapies for diseases affecting humans, including cancer. Cloning will also enable animal models that test theories of disease and treatment to be more easily developed before applying such applications in humans.[44]

2. *Cloning Humans*.—Cloning by nuclear transfer also has the potential for direct human applications—the production of embryos or even persons as a result of human cloning. These uses, however, are much more controversial, for they require the production of an embryo, fetus, or child with the same DNA as another. Such uses lie at the center of the current debate over the acceptability of human cloning and public policy toward it.

a. Cloning of embryos to treat infertility.—One likely use would be the cloning of embryos to enhance the fertility of couples, with viable egg and sperm going through in vitro fertilization (IVF) treatment for infertility. Cloning might occur by embryo splitting or by removing the cell or blastomeres of one or more embryos and placing them into enucleated eggs to create additional embryos. The purpose here either would be to assure the creation of enough embryos to start a pregnancy in cases when only one or two eggs are produced or to eliminate the high costs and physical burdens of additional hyperstimulated cycles and surgical retrieval.[45]

Cloning embryos in these ways would produce one or more embryos with the same genome (although mitochondrial DNA will differ, except in

---

animals). On the other hand, it could adversely affect investments in racehorses. The Jockey Club, the official registrar of thoroughbred racing, is opposed to cloning of racehorses. *See* Thomas Heath, *Clone 'Em If You Got 'Em: Cigar's Owner Seeing Double*, WASH. POST, Mar. 14, 1997, at C1 (reporting that the Jockey Club interprets its rules of registration in such a way as to exclude cloning or other forms of assisted breeding).

43. *See* NBAC CLONING REPORT, *supra* note 3, at 28-29 (predicting that research on cell differentiation will lead to the development of treatments for human disease).

44. *See id.* at 29 (contending that animal models will reveal which techniques are widely applicable and which require further development before being applied to human cells).

45. The average cost of a stimulated cycle of IVF and retrieval is $8,000. *See* Michael D. Lemonick, *The New Revolution in Making Babies*, TIME, Dec. 1, 1997, at 40, 45. The process requires injection of hormones over several days and usually ultra-sound guided transvaginal aspiration of oocytes, under anesthesia. Complications to the patient, though rare, are also possible. Although nuclear transfer from embryos will require a supply of enucleated eggs, these might be obtained from a few donors with less overall intrusion or from sources that have not undergone stimulation and surgical retrieval.

the case of embryo splitting). If they were placed in the uterus at the same time, they might produce two or more offspring with the same genome, resulting in the novelty of deliberately created twins.[46] More problematic situations arise if a child is born from the first transfer, and the couple later thaws and transfers the other cloned embryos in order to have additional children. The result could be one or more children born at different points in time with the same genome.

b. Cloning in lieu of donor gametes.—A second likely use of cloning would arise with couples who are infertile due to gametic insufficiency. With male infertility, the couple might seek donor sperm, usually obtained from a commercial sperm bank, a fertility clinic, or the program treating the patient. In the case of ovarian insufficiency, paid or familial egg donors are frequently used. Some couples faced with the prospect of commercial, anonymous sperm or egg donors may well prefer to use the DNA of one of themselves.[47] In the case of male infertility, as well as gestating, the wife may provide the egg, the egg and the DNA, or just the DNA (in which case eggs will have to be obtained from a donor). In the case of female infertility, she may provide the DNA and gestate, even though she cannot provide the egg.

Couples may also seek a gamete donor for reasons other than gametic insufficiency. For example, a couple who are carriers of genetic disease usually have a one-in-four risk of transmitting the disease to offspring. Instead of getting pregnant and undergoing prenatal diagnosis and an abortion if tests are positive, some would utilize a gamete donor, go childless, or adopt. Cloning one of them or a third party provides an additional option to anonymous commercial sperm or egg donors.[48] Alternatively, if they have already had a child who does not have the disease for which they are at risk, they might prefer to clone it rather than risk having other offspring with that disease.[49]

---

46. For a discussion of the problems that might arise if more than two embryos implant, see John A. Robertson, *The Question of Human Cloning*, HASTINGS CTR. REP., Mar.-Apr. 1994, at 6, 10-11 (recounting the physical risks and ethical issues that the deliberate creation of multifetal pregnancies and later-born twins raise).

47. Using their own DNA would also minimize the risk of transmission of infectious or genetic disease from anonymous donors, which occasionally occurs. In one recent case, a couple sued a California sperm bank for inadequately screening a sperm donor who had polycystic kidney disease in his family, later contracted the disease himself, and transmitted it to the child born to this couple. *See* Julie Marquis, *Gift of Life, Questions of Liability*, L.A. TIMES, Aug. 9, 1997, at A1. Cloning the DNA of the husband or wife would have avoided this problem.

48. The NBAC used this example as an arguably acceptable use of cloning because it avoided both donor gametes and selective abortion, but allowed the at-risk couple to maintain a genetic tie to the child. *See* NBAC CLONING REPORT, *supra* note 3, at 80.

49. I am indebted to Gina Shishima for this example. A similar need would arise if a child with a severe genetic disease, such as severe combined immune deficiency (SCID), were successfully treated

A further variation on this theme would arise if both spouses lacked gametes and thus were candidates for embryo donation. As with the need for a single gamete donation, they might prefer using the DNA of a third party rather than using embryos left over from the IVF process by infertile couples who themselves had to resort to IVF. In lieu of the DNA of a third party, they might find it preferable to use the DNA of one of themselves, with the wife then gestating and the couple rearing.

Some commentators have noted that lesbian couples might choose to clone one of themselves to exercise more control over their reproduction.[50] Each could contribute genetic material to a child (one the nuclear DNA, the other the egg and mitochondrial DNA), which one of them gestates and the other jointly rears. In this case they would both have a biologic connection with the child, and thus each might claim biologic motherhood.[51]

c. Cloning as a source of organs or tissue.—Nuclear transfer cloning in humans would also help produce organs or tissue for transplant while minimizing rejection. The best tissue match for someone needing a tissue or organ transplant would be an identical twin because twins would share an immune system and antigens. Nuclear transfer cloning would enable the recipient's DNA to be used as a clone source, with the resulting embryos placed in the uterus of the recipient's mother or a third party gestator. When that person is born, their cord blood, tissue, or organs could be used as an organ or tissue donation for the recipient, who is a previously born identical twin. Of course, the organs or tissue could not be taken without the donor's consent and, in the case of minors, only when no net harm would come to the minor donor.[52]

Because of the ethical problems that arise with creating a child to serve as a donor source, it would be desirable to produce the same tissue or organs without having to undergo human gestation, birth, rearing, and the problems of consent and potential abuse that arise because of the need to respect the interests of the organ source. Arguably, the more acceptable

with somatic cell gene therapy. Rather than risk having another child with SCID who would have to be treated, the couple might choose to clone the successfully treated child.

50. *See, e.g.*, Anita Manning, *Pressing a "Right" to Clone Humans: Some Gays Forsee Reproduction Option*, USA TODAY, Mar. 6, 1997, at D1 (quoting Ann Northrop, columnist for a New York gay newspaper, as opining that cloning has the potential of "giving women complete control over reproduction"). This procedure, however, would not exclude males totally from reproduction because the clone source herself is the result of male reproduction. Thus, her genetic father will also be the genetic father of the resulting child, although he might be treated socially as the child's grandfather. For further discussion of relations between the resulting child and the clone source's genetic parents, see *infra* notes 191, 193 and accompanying text.

51. *See infra* note 262.

52. *See infra* note 173 and accompanying text.

option would be to clone by nuclear transfer up to the blastocyst stage and then remove embryonic stem cells prior to differentiation.[53] If the stem cells could be stimulated in vitro to differentiate into precursors of blood, pancreatic, neuronal, and other cell lineages, they would provide a potential source of stem cells for regeneration of all the tissues of the body. Because they would be clones of the recipient, problems of rejection would also be overcome. As the *NBAC Cloning Report* notes, "[a]n alternative scenario would involve the generation of a few, widely used and well characterized human embryonic stem cell lines, genetically altered to prevent graft rejection in all possible recipients."[54]

d. Replacing a dead child and other uses.—Human cloning would also enable a couple to select or replicate the genome of another for reasons other than infertility, genetic disease, or producing organs and tissue for transplant. One often-cited reason is to replace a dead or dying child. A sample of its DNA could be used to generate an embryo that would then be implanted into the mother. This would enable the deceased son or daughter's DNA to continue and contribute to life, even when gone.[55]

A variation on this replacement procedure might arise with a family in a terrible accident. The father is killed, and the only child, an infant, is dying. The mother decides to remove some cells from the dying infant in an attempt to use somatic cell nuclear transfer to create a new child. The purpose here is not simply to replace a dead child, but also to rear a child who is the offspring of her dead husband.[56]

Other scenarios might involve a couple who wants to ensure that their children have a more advantageous genome than their own, or simply a healthy one if the parents risk transmitting genetic disease. Even though able to reproduce coitally, they select DNA that they find desirable to produce a child. Or they may want to clone one of themselves so the other partner can have the experience of rearing a younger version of their mate.

---

53. Although some persons will object to the creation of embryos to serve as a source of stem cells and then to be destroyed, obtaining tissue at the embryo level will be more widely acceptable than waiting until the fetal stage and aborting the fetus to obtain its tissue or organs for transplant. *See infra* notes 215-26 and accompanying text.

54. *See* NBAC CLONING REPORT, *supra* note 3, at 31. Progress here may be quicker than expected. In July 1997, investigators reported that they "may have isolated for the first time human embryonic cells that have the potential to develop into muscle, blood, nerves, or any other tissue in the body." John Travis, *Human Embryonic Stem Cells Found?*, 152 SCI. NEWS 36, 36 (1997).

55. Such cloning might create unrealistic expectations and other psychological complexities for the cloned child that will need careful attention if the experience is to be positive for all participants. *See* discussion *infra* section IV(B)(3).

56. *See* NBAC CLONING REPORT, *supra* note 3, at 80 (presenting this scenario as an arguably acceptable use of cloning).

Or they may want to clone an existing child because they love her so much and want more like her. They might be the last member of a family that perished in the Holocaust and want to be sure that that family lineage remains in the world.[57] Because such motivations tend to be eugenic and do not relate to infertility or producing organs, they are likely to be even more controversial.

B. *The Controversy over Human Cloning*

The announcement on February 23, 1997 of the birth of Dolly produced a split reaction. On the one hand, there was widespread support for continued clone research into cloning animals. Dr. Wilmut received praise throughout the world for his scientific vision and ingenuity.[58] In an appearance before the United States Senate, he spoke about the great benefits that cloning animals could produce.[59] Other witnesses also discussed the commercial and medical uses of animal cloning and opposed overrestrictive barriers to animal cloning research.[60] A national consensus quickly formed agreeing that cloning animals was a good thing and should continue.

On the other hand, there was deep opposition to the idea of cloning humans, particularly from adult somatic cells by nuclear transfer, and even to the research that might make cloning feasible. In the same Senate appearance, Dr. Wilmut declared the idea of cloning a human to be repugnant.[61] Whether or not he adopted this strategic position to enable

57. This use of cloning was suggested by the Orthodox Rabbi Moshe Tendler in testimony to the National Bioethics Advisory Commission. Rabbi Tendler's example assumes that the person is not married and coitally fertile, for there would then be no need to resort to cloning to have genetic descendants. If the couple were married and infertile, the husband's survivor status would give an additional reason for engaging in self-cloning in lieu of gamete or embryo donation. If the survivor were not married and did not intend to rear, he might still argue for the right to be cloned—for example, the right to serve as the DNA for a couple willing to gestate and rear his clone. Because of the importance to the survivor of knowing that his genetic descendants exist in the future world, the Holocaust survivor example might be the rare case for a right of genetic reproduction *tout court*. For further discussion of reproduction *tout court*, see *infra* note 119, and see also Michael Broyde, *Cloning People: A Jewish Law Analysis of the Issues*, 30 CONN. L. REV. 503, 532-33 (1998) (arguing that once the technical complexities of human cloning are resolved, human cloning will be another form of assisted reproduction, and is likely to be permitted by Jewish law).

58. *See, e.g.*, NBAC CLONING REPORT, *supra* note 3, at 13 (noting that "the birth of Dolly was lauded as an amazing success").

59. *See 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. 20-21 (1997) [hereinafter *Hearings*] (statement of Dr. Ian Wilmut, embryologist, Roslin Institute) (testifying to the potential beneficial uses of cloning technology in animal breeding and the production of transgenic livestock).

60. *See* Gina Kolata, *Congress Is Cautioned Against Ban on Human-Cloning Work*, N.Y. TIMES, Mar. 13, 1997, at B11 (reporting that animal cloning research could lead to the development of animal clones that serve as "miniature drug factories" and organ donors for humans).

61. *See Hearings*, *supra* note 59, at 22 (statement of Dr. Ian Wilmut).

his animal research to continue, Dr. Wilmut and others repeated before Congress, in the media, and in commentary a refrain of horror, repugnance, and inhumanity from human cloning.[62] Bills to ban cloning were introduced in Congress and in state legislatures, and most official advisory bodies condemned it.[63] President Clinton initially called for a moratorium on private cloning and quickly requested Congress to enact the federal criminal ban that the NBAC had recommended.[64] Bills to ban human cloning for ten years or even permanently have been introduced.[65] In October 1997, California became the first state to ban human cloning.[66] In September 1997, the Council of Europe, citing threats to the "dignity and identity of all human beings," amended one of its human rights conventions to ban cloning.[67]

What explains this clean split between animal and human cloning? The support for animal cloning was understandable and expected. Creating, destroying, and manipulating animals has long been considered by many people to be a human right. Given the other things we do to animals, creating copies of them hardly seemed like an evil. Many commercial applications directly benefiting persons could be imagined. Using science to choose or replicate the genes of animals, with its many benefits for humans, was an occasion for praise not condemnation.

At the same time, opposition to human cloning was also understandable. The idea of turning out replicas of persons was deeply unsettling, for it appeared to contradict the very notion of respect for individual persons that undergirds our moral and legal system and permeates society. These were the images that people popularly associated with the birth of Dolly. Without any good idea of what cloning another person would actually entail, the dominant image was that of wholesale

---

62. *Cf.* President's Remarks, *supra* note 5, at 844 (characterizing this repugnance to human cloning as reflecting a "national consensus").

63. *See supra* notes 3-6 and accompanying text.

64. *See supra* notes 2, 5 and accompanying text. The political nature of such reactions was captured in a *New Yorker* cartoon showing a couple in front of a television watching President Clinton speaking against cloning. One of them comments, "Still, he might be remembered as the 'no cloning' President." Warren Miller, cartoon, NEW YORKER, July 7, 1997, at 60. President Clinton included a call for a ban on human cloning in his 1998 State of the Union Address. *Transcript of the State of the Union Message from President Clinton*, N.Y. TIMES, Jan. 28, 1998, at A19.

65. For the specific language of the bills submitted by Senators Feinstein and Kennedy, see Prohibition on Cloning of Human Beings Act of 1998, S. 1602, 105th Cong. (1997). For examples of alternative legislation, see *infra* note 223 (discussing the bills introduced by Senators Bond and Frist and Representative Eilers).

66. *See* Act of Oct. 4, 1997, ch. 688, 1997 Cal. Legis. Serv. 3790 (West, WESTLAW through 1997 Sess.) (codified as amended in scattered sections of the CAL. BUS. & PROF. CODE and the CAL. HEALTH & SAFETY CODE). For a problem with the language of the statute, see *infra* note 194.

67. *Council of Europe: Draft Additional Protocol to the Convention on Human Rights and Biomedicine on the Prohibition of Cloning Human Beings with Explanatory Report and Parliamentary Assembly Opinion*, Sept. 22, 1997, 36 I.L.M. 1415, 1419 (1997) [hereinafter *Council of Europe*].

copying of existing individuals, thus opening the door to many scenarios of arrogance, power, or abuse.

The initial image of cloning in the popular media was that one could now simply go out and make a copy of oneself or anyone else, who would then be subject to the whim or control of the cloner.[68] This conception of cloning appeared to deny the uniqueness or individuality of persons created with the DNA of others. It also appeared to give inordinate power over others to the person initiating the cloning. Moreover, one could have as many clones as one wanted—and possibly of *whom* one wanted. Names of possible candidates for cloning appearing in the mass media included Michael Jordan, Dennis Rodman, Madonna, and William Gates.[69] The more literate press usually mentioned persons who were deceased, such as Abraham Lincoln, Mozart, or Einstein.[70] Less imaginative persons thought of cloning themselves, their parents, or their pets.

A variety of horrific possibilities presented themselves. Unscrupulous dictators could clone a subject class, as in Huxley's *Brave New World*,[71] or create an army of genetically engineered brutes to do their bidding. Narcissistic tycoons might clone themselves to extend their power in the world. Those with media name recognition or commercial appeal could license or sell their DNA to others, turning children into products or commodities rather than persons to be loved and nurtured for themselves. At the individual level, persons could clone and raise genetic replicas of themselves or their parents, thus enormously complicating the tasks of raising children. Since reproduction by cloning is asexual, a woman could take DNA from her own cells or those of her mother, create embryos with

---

68. *Sleeper*, Woody Allen's 1973 futuristic film about cloning, assumed that a complete replica of a person, with all of that individual's characteristics, memories, and sense of identity, would result from cloning a person's nose. *See* SLEEPER (Metro-Goldwyn-Mayer 1973). *Multiplicity*, a 1996 film starring Michael Keaton, conveyed the image that cloning could produce carbon copies of the person cloned by a surgical procedure under anesthesia. In this case, the cloning was sought to enable the film's hero, a construction manager, to gain more time to deal with the multiple demands on his time from work, family, and spouse. The film recounts the comic situations that result from having two identical individuals attempting to play the role of one person, without others knowing of the trick. *See* MULTIPLICITY (Sony 1996).

69. One cloning fantasy entailed five clones of Michael Jordan playing five other clones of Michael Jordan, to the sheer delight of basketball fans everywhere. *See* Art Buchwald, *The More the Scarier*, WASH. POST, Mar. 6, 1997, at B1. Or imagine ten Bill Gates clones duking it out for control of the computer software world. *Cf.* Katharine Q. Seelye, *Daydreams of Cloning*, N.Y. TIMES, Mar. 9, 1997, at 2 (reporting the results of a poll in which 3.9% of those surveyed named Bill Gates as their clone of choice from a list of eight famous people).

70. Dr. Wilmut used a clone of Einstein who failed a math test as an example of how clones would be denied their own individuality. *See CNN Larry King Live* (CNN television broadcast, June 24, 1997 (transcript at 9, on file with the *Texas Law Review*).

71. ALDOUS HUXLEY, BRAVE NEW WORLD 10-12 (Time Inc. Books 1963) (1932) (depicting a futuristic society in which a lower caste of citizens are genetically engineered and then decanted from bottles in laboratories).

it, gestate them, and then rear a child who would be an identical twin of the woman herself.[72] Many people saw such uses as destroying the resulting child's individuality, autonomy, or proper sense of family lineage, while giving parents, doctors, and unscrupulous entrepreneurs inordinate power over the make-up of offspring.

The idea of human cloning thus provided a fertile arena for fantasies about exercising a despotic or narcissistic power over others, thereby depriving them of the uniqueness and autonomy that seems central to human dignity.[73] Contributing to the negative reaction was a healthy skepticism that scientists or others could be trusted to observe appropriate boundaries for reproductive innovation. When a science entrepreneur named Richard Seed, who had no particular qualifications in reproductive medicine, proposed in December 1997 to start a for-profit company that would begin cloning human beings, there was further proof that human nature, with its deeply embedded arrogance and greed, could not be readily entrusted with such an awesome power.[74] With the eugenics movement in the United States and Germany hovering in recent memory, one could not be sure that the worst uses of cloning would not occur.[75] At this time, moral condemnation and legal prohibition seemed the best course.[76]

Contributing to the negative reaction was the absence of clear counter images of the good that human cloning could do. Because cloning had not previously appeared feasible, little attention had been given to possible legitimate uses, and no respectable lobbying group in favor of human cloning existed. The bioethics literature made scant reference to it, except for a flurry of quite negative writing in the 1970s, long before assisted reproduction and genetic screening had become routine practices.[77]

---

72. Lesbian couples could have children asexually, thus not needing a man as a source of sperm (although there would be a sperm source somewhere in the lineage). *See supra* note 50 and accompanying text.

73. An especially articulate version of the ethical objections to cloning is Leon R. Kass, *The Wisdom of Repugnance*, NEW REPUBLIC, June 2, 1997, at 17.

74. *See* Gina Kolata, *Proposal for Human Cloning Draws Dismay and Disbelief*, N.Y. TIMES, Jan. 8, 1998, at A22 (noting that some geneticists regard Seed's announcement as "'an irresponsible and reprehensible act'" that "'frightens people as to what our intent might be and . . . undermines the benefits of this whole area of [cloning] research'").

75. Ironically, publicity about Seed's plans, coming at a time when the immediate threat of cloning had appeared to wane and voices in favor of cloning were being heard, served to revive the bills to outlaw human cloning that were languishing in Congress. The eponymous Richard Seed thus might have succeeded in getting his own activities banned by the very act of publicizing them. *See* Sheryl Gay Stolberg, *A Small Spark Ignites Debate on Laws on Cloning Humans*, N.Y. TIMES, Jan. 19, 1998, at A1.

76. *See infra* note 205 and accompanying text (discussing society's revulsion at the American and Nazi sterilization practices in the early part of the twentieth century).

77. *See, e.g.*, HANS JONAS, *Biological Engineering—A Preview*, *in* PHILOSOPHICAL ESSAYS: FROM ANCIENT CREED TO TECHNOLOGICAL MAN 141, 163, 153-63 (1974) (opposing cloning on the basis that it would deny the clone the "right to ignorance" in finding his own way in the world, free of a pre-

Aside from some persons in the gay rights community, who saw cloning as a way to gain some control over family and reproduction,[78] cloning initially had few advocates. Fertility doctors, the prime candidates for providing cloning services, strategically distanced themselves from adult somatic cell cloning while leaving open the possibility of embryo splitting or nuclear transfer cloning in the future.[79] Beyond the media's concern with celebrity cloning, the uses initially articulated for cloning—replacing a dead child, obtaining organs for transplant, or treating infertility—were vaguely formulated and seemed to apply to a small number of people. A few bioethicists defended some uses of cloning and pointed to the vague and speculative nature of the alleged harms. Overall, however, there was no clear idea of why cloning was needed or what good it would serve.

With further time to reflect on possible uses of cloning and its dangers, we are now much better situated to assess the advantages and disadvantages of human cloning and to determine what public policy toward it should be. Although human cloning is still far from being established as safe and effective in humans, it is now possible to articulate several plausible uses that fit closely with existing reproductive and genetic selection practices. A more considered assessment of human cloning is important for several reasons. First, it will help us come to terms with the issues that human cloning presents. Second, the concepts and issues that elucidate cloning should also help elucidate the other issues of genetic selection and manipulation that will soon confront us. Assessment of cloning will thus help us come to terms with the genetic revolution in the midst of which we now find ourselves.

The next Part discusses whether the most likely uses of cloning fit within prevailing conceptions or understandings of procreative liberty. Other Parts will address the harms of cloning and how public policy should respond to the ability to clone humans.

---

conceived model); PAUL RAMSEY, FABRICATED MAN 96 (1972) (seeing within the "boundless freedom" of self-determination that cloning technology may provide the human species only "boundless destruction" and "unlimited subjugation of man to his own rational designs and designers"); Leon R. Kass, *Making Babies—The New Biology and the "Old" Morality*, 26 PUB. INTEREST 18, 55 (1972) (arguing that mankind lacks the wisdom to properly handle the power of human reproductive technology); Francis C. Pizzulli, Note, *Asexual Reproduction and Genetic Engineering: A Constitutional Assessment of the Technology of Cloning*, 47 S. CAL. L. REV. 476, 583 (1974) (concluding that a prohibition of human cloning "may well be a constitutionally permissible approach" serving state interests of protecting the nuclear family unit and preserving the sanctity of the individual).

78. *See* Manning, *supra* note 50.

79. Their main professional association, the American Society of Reproductive Medicine, was quick to oppose adult human cloning, although it adopted a statement that cloning by blastomere separation was acceptable. Press Release from ASRM, Statement on Human Cloning Through Nuclear Transplantation (Mar. 5, 1997) (on file with the *Texas Law Review*).

III. The Demand for Human Cloning and Procreative Freedom

A proper assessment of cloning requires that it be viewed in light of the realities of how it might be used once it is shown to be safe and effective. The most likely uses would be as extensions of current reproductive and genetic-selection technologies. Several plausible uses can be articulated; ones quite different than the horrific scenarios originally imagined. The question then becomes: Do these uses fall within mainstream understandings of why procreative freedom warrants special respect as one of our fundamental liberties? Investigation of this question will set the stage for examining what the possible harms of cloning are and, thus, what public policy toward human cloning should be.

A. The Demand for Human Cloning

Legitimate, family-centered uses of cloning are likely—precisely because cloning is above all a commitment to have and rear a child. The process will involve obtaining oocytes, acquiring the DNA to be cloned, transferring that DNA into an enucleated egg, and placing the activated embryo in a uterus, followed by the gestation, nurturing, and rearing that the birth of any child requires.[80] In addition, it will require a psychological commitment and ability to deal with the novelty of raising a child whose genome has been chosen, and who may be the later born identical twin of another person, living or dead.

The most bizarre or horrific scenarios of cloning conveniently overlook the basic reality that human cloning requires a gestating uterus and a commitment to rear. The gestating mother is eliminated through the idea of total laboratory gestation, as in *Brave New World*,[81] or through high tech surgery, as in *Multiplicity*.[82] In other scenarios it is thought that an evildoer can hire several women to gestate copies, with little thought given to how they would be reared or molded to be like the clone source. Nearly all of these fears overlook the impact of environmental influences on the cloned child and the duties and burdens that rearing any child requires.[83]

---

80. Many variations are possible here. In some cases the wife will provide the egg into which DNA is inserted. In other cases, an egg donor, as well as a DNA source, will be needed. This will increase the demand for egg donors and will lead to some women undergoing those risks, usually for money, so that other couples may chose their child's genome. The use of donor eggs in cloning also means that female reproduction or parentage will be split into the source of the DNA, source of egg and mitochondria, gestation, and rearing. *See infra* note 180 and accompanying text.

81. *See* HUXLEY, *supra* note 71.

82. *See* MULTIPLICITY, *supra* note 68.

83. However, one of the most popular cloning films, *The Boys from Brazil*, shows an awareness that genes only partially determine who we are and that nurture and environment are also powerful. The events of the film turn on the need to kill the adoptive, rearing fathers of Hitler clones in order to recreate Adolf Hitler's upbringing, in which his father died when he was 14. *See The Boys from Brazil* (ITC Films 1978).

They also overlook the extent to which the cloned child is not the property or slave of the initiator, but is a person in her own right with all the rights and duties of other persons.

Because cloning is first and foremost the commitment to have and rear a child, it is most likely to appeal to those who wish to have a family, but cannot easily do so by ordinary coital means. In some cases, they would turn to cloning because of the advantages that it offers over other assisted reproductive techniques. Or they would choose cloning because they have a need to exercise genetic choice over offspring, as in the desire for a healthy child or for a child to serve as a tissue donor. Given the desire to have healthy children, it is unlikely that couples will be interested in cloning unless they have good reason for thinking that the procedure is safe and effective and that only healthy children will be born.[84]

The question for moral, legal, and policy analysis is to assess the needs that such uses serve—both those expected to be typical and those that seem more bizarre—and their importance relative to other reproductive and genetic selection practices. Can cloning be used responsibly to help a couple achieve legitimate reproductive or family formation goals? If so, are these uses properly characterized as falling within the procreative liberty of individuals and thus not subject to state restriction without proof of compelling harm?

To assess these questions, we must first investigate the meaning of procreative liberty and then ask whether uses of cloning to enhance fertility, to substitute for a gamete or embryo donor, to produce organs or tissue for transplant, or to pick a particular genome fall within common understandings of that liberty.

B. Human Cloning and Procreative Liberty

The question to be asked about each likely use of cloning is whether it is an exercise of procreative liberty that deserves the special protection ordinarily accorded to procreative choice. To answer this question, we must consider the meaning and scope of procreative liberty and then ask whether different types of cloning fit within that meaning. Here cloning of embryos and existing children may initially have different status than cloning oneself or third parties.

Although the NBAC Report and many commentators have focused on adult somatic cell nuclear transfer, the following discussion includes all forms of cloning—embryo splitting and nuclear transfer from embryos or fetuses, as well as somatic cell nuclear transfer or cell fusion from children

84. Given this desire, it is unlikely that legislation to ban cloning until it is shown to be safe and effective is necessary. *See* discussion *infra* section V(A)(2).

or adults. In some cases the family needs sought through cloning can be satisfied by cloning embryos or children. In others, somatic cell transfer from adults will be necessary. Threats to individuality, autonomy, and lineage can arise with any form of cloning, although some harms, such as confusion about family lineage and autonomy may be more likely with adult cloning of somatic cells than with the cloning of embryos.[85] The discussion assumes that all forms of cloning are equally effective although important differences in the ability to clone successfully may exist among them.

1. The Meaning and Scope of Procreative Liberty.—Procreative liberty is the freedom to decide whether or not to have offspring. It is a deeply accepted moral value and pervades many of our social practices.[86] Its importance stems from the impact which having or not having offspring has in our lives. This is evident in the case of a choice to avoid reproduction. Because reproduction imposes enormous physical burdens upon the woman, as well as social, psychological, and emotional burdens on both men and women, it is widely thought that people should not have to bear those burdens unless they voluntarily choose to do so.[87]

But the desire to reproduce is also important. It connects people with nature and the next generation, gives them a sense of immortality, and enables them to rear and parent children. Depriving persons of the ability or opportunity to reproduce is a major burden and should not occur without their consent.

Reproductive freedom—the freedom to decide whether or not to have offspring—is generally thought to be an important instance of personal liberty, indeed, given its great impact on a person, a fundamental personal liberty.[88] Of course, both the liberty to avoid and the liberty to engage in reproduction are contested in certain instances, as controversies over abortion and population limits illustrate. In recent years the emergence of assisted reproduction, noncoital means of conception, and prebirth genetic selection has also raised controversies about the limits of procreative freedom. Questions about cloning and procreative liberty are situated in those controversies.

---

85. The NBAC purported to speak only about cloning by adult somatic cell nuclear transfer, although a footnote occasionally says otherwise. *See* NBAC CLONING REPORT, *supra* note 3, at iii. The report simply addresses adult somatic cell cloning, without explaining why the same considerations do or do not apply to embryo splitting or to nuclear transfer from embryos and children.

86. The moral and legal arguments for procreative liberty are presented in JOHN A. ROBERTSON, CHILDREN OF CHOICE: FREEDOM AND THE NEW REPRODUCTIVE TECHNOLOGIES 22-42 (1994).

87. The abortion debate does not belie this. Indeed, it gains much of its energy from a recognition of the importance to women of being able to avoid unwanted reproduction. Abortion raises the issues of where the right *not* to reproduce ends, not whether it exists in the first place.

88. *See infra* notes 248-49 and accompanying text (asserting that the right to have children is a fundamental constitutional right).

The question of whether cloning is part of procreative liberty is a serious one only if noncoital, assisted reproduction and genetic selection are themselves part of that liberty. A strong argument exists that the moral right to reproduce does include the right to use noncoital or assisted means of reproduction.[89] Infertile couples have the same interests in reproducing as coitally fertile couples and the same abilities to rear children. Coital infertility should no more bar them from reproducing with technical assistance than visual blindness should bar a person from reading with Braille or with the aid of a reader. It thus follows that married couples (and arguably single persons as well) have a moral right to use noncoital assisted reproductive techniques, such as in vitro fertilization (IVF) and artificial insemination with a spouse or partner's sperm, to beget biologically related offspring for rearing. It should also follow—although this is more controversial—that the infertile couple would have the right to use gamete donors, gestational surrogates, and even embryo donors if necessary. Although third-party collaborative reproduction procedures do not replicate exactly the genes, gestation, and rearing unity that ordinarily arises in coital reproduction, they come very close and should be treated accordingly. Each of these procedures, with varying degrees of closeness, enables the couple to have or rear children biologically related to at least one of them.[90]

Some right to engage in genetic selection would also seem to follow from the right to decide whether or not to procreate.[91] People make decisions to reproduce or not because of the package of experiences that they think reproduction or its absence would bring. In many cases, they would not reproduce if it would lead to a packet of experiences *X*, but they would if it would produce packet *Y*. Since the makeup of the packet will determine whether or not they reproduce, a right to make reproductive decisions based on that packet should follow. Some right to choose characteristics, either by negative exclusion or positive selection, should

89. *See* ROBERTSON, *supra* note 86, at 38-40 (arguing that the principles underlying a constitutional right to reproduce would apply equally to all couples, including the coitally infertile).

90. The use of gamete donors and surrogates to form a family are more controversial because they deviate from the standard unity of genes, gestation, and rearing in a married couple. Thus, sperm donation replaces the paternal genetic tie with an anonymous donor, but the couple then proceeds to rear as if the non-related husband were the father. Egg donation is actually closest to normal triunal family relations, in that the woman has a gestational, though not a genetic tie. Gestational surrogacy preserves the usual genetic tie between parents and offspring, though gestation is done by another. Embryo donation has a gestational biologic tie but no genetic connection between rearing parents and child. Surrogacy with egg donation, on the other hand, has no female genetic tie, but it does contain the usual paternal genetic tie. Adoption, however, involves no biologic tie between offspring and rearing parents, nor does the use of assisted techniques in connection with a commissioned adoption.

91. For an elaboration of this argument, see John A. Robertson, *Genetic Selection of Offspring Characteristics*, 76 B.U. L. REV. 421, 424-32 (1996).

follow as well, for the decision to reproduce may often depend upon whether the child will have the characteristics of concern.

From this brief account, one sees that procreative liberty is clearly accepted in many respects but contested in others, particularly with regard to the use of donors and surrogates and choosing and selecting offspring characteristics. Many contested areas involve technological innovations that have not yet been fully assimilated. Although the scope of procreative liberty has not yet been clearly defined, a process or methodology for addressing these issues has now been identified.[92] It involves looking closely at a new practice, say IVF or gamete donation or surrogacy, and investigating its connection with the interests and understandings that make coital reproduction a valued activity.[93] Such an inquiry leads to the conclusion that most new reproductive techniques should be presumptively viewed as part of procreative liberty because they enable an infertile couple to rear offspring who are related by genes or gestation to one or both of the rearing pair. The same is true of many forms of genetic selection, at least negative selection.[94]

If most current forms of assisted reproduction and genetic selection fall within prevailing notions of procreative freedom, then a strong argument exists that some forms of cloning share certain aspects of procreative liberty as well, for cloning shares many features with assisted reproduction and genetic selection. For example, the most likely uses of cloning would enable a married couple, usually infertile, to have healthy, biologically related children for rearing.[95] Or it would allow them to obtain a source of tissue for transplant to enable an existing child to live.

Cloning, however, is also different in important respects. Unlike the various forms of assisted reproduction, cloning is concerned not merely with producing a child, but rather with producing a child with a *particular* set of genes. Many prebirth genetic-selection techniques are now in wide use, but they operate negatively by excluding undesirable genetic

---

92. *See* ROBERTSON, *supra* note 86, at 40-42 (describing the emerging delineation of the boundaries of procreative liberty in light of new reproductive technologies).

93. Not every reproductive innovation will automatically be protected. Posthumous reproduction, for example, involves fewer of the interests that make reproduction so important for people, and thus might not deserve the same respect that is owed to other forms of assisted reproduction. *See* John A. Robertson, *Posthumous Reproduction*, 69 IND. L.J. 1027, 1031-32 (1994) (pointing out that posthumous reproduction lacks many of the important and valued features associated with the core reproductive experience, including the individual's ability to rear the child).

94. *See* Robertson, *supra* note 91, at 479 (concluding that "[p]rebirth selection of offspring characteristics is a basic right because it may determine whether reproduction will or will not occur, and in most instances does not harm the offspring or other important interests").

95. This Article emphasizes the rights of married couples because they will be perceived as having a stronger claim to have children than unmarried persons. If their rights to clone are recognized, then the claims of unmarried persons to clone might follow.

characteristics, rather than positively as cloning does.[96] Moreover, none of them are able to select the entire nuclear genome of a child as cloning does.[97]

Furthermore, cloning is not the final or even the most threatening form of genetic selection. Eventually, scientists will develop techniques of gene alteration by insertion or deletion of genes. The motivating purpose will be to cure disease at the genetic level. Once developed, however, those techniques might also be used to enhance the genetic makeup of offspring or even to diminish them prior to birth.[98] The prospect of more extensive genetic manipulation of offspring is hardly a reason to allow human cloning. If anything, it creates even greater pressure to come to terms with cloning now so that we may deal more effectively with genetic enhancement and diminishment once they are developed.

A key question about cloning is how closely it fits with the interests, practices, and understandings that make procreation and having and rearing children a valued activity. The following discussion analyzes that question in terms of the different sources of DNA that might be used in cloning. While recognizing that answers here are ultimately constitutive and not wholly determined by rational analysis, it argues that cloning embryos, children, third parties, self, mate, or parents is an activity so similar to coital and noncoital forms of reproduction and family formation that they should be treated equivalently.

a. Cloning a couple's embryos.—Cloning embryos, either by embryo splitting or nuclear transfer, would appear to be closely connected to procreative liberty. The procedure is intended to enable a couple to rear a child biologically related to each, either by increasing the number of

96. Genetic selection techniques now in wide use include maternal alpha-fetal protein screening, ultrasound, chorion villus sampling, and amniocentesis. These techniques identify an affected fetus and give parents the chance to terminate the pregnancy prior to birth. Preimplantation screening of embryos avoids the need for abortion, but does discard embryos. Preconception carrier screening allows couples who are both carriers of a genetic defect to plan among these various options in advance.

97. Because only nuclear DNA is transferred in cloning, DNA contained in the egg's cytoplasm in the form of mitochondria is not cloned or replicated (it is in the case of cloning by embryo-splitting). The resulting child is thus not a true clone, for its mitochondrial DNA will have come from the egg source, which will not usually be providing the nucleus for transfer. *See supra* note 16. Mitochondria DNA represents only a small portion of total DNA, perhaps 5%. However, malfunctions can still cause serious disease. *See* Douglas C. Wallace, *Mitochondrial DNA in Aging and Disease*, SCI. AM., Aug. 1997, at 40, 46 (reporting that random accumulation of mitochondrial DNA mutations over time could contribute to the common effects of aging—such as loss of memory, hearing, vision, and stamina—as well as to more serious disorders that debilitate the elderly).

98. *See* Robertson, *supra* note 91, at 436-39 (discussing the procreative liberty interests implicated in using prebirth selection technologies to achieve nontherapeutic enhancement or even intentional diminishment of offspring); *see also* discussion *infra* Part VI (describing the implications of other forms of prebirth genetic alteration that will make possible the specific alteration of genes).

embryos available for transfer or reducing the need to go through later IVF cycles.[99] Its reproductive status is clear whether the motivation for transfer of cloned embryos to the wife's uterus is simply to have another child or to replace a child who has died. In either case, transfer that utilizes the couple's egg and sperm leads to the birth of a child whom they will rear.

Eventually, couples might seek to clone embryos, not to produce a child for rearing, but to produce an embryo from which tissue stem cells can be obtained for an existing child. In that case, cloning will not lead to the birth of another child. However, it involves use of their reproductive capacity. It may also enable existing children to live. This use of embryo cloning should also be considered to fall within the procreative or family autonomy of the couple.

b. Cloning one's children.—The use of DNA from existing children to produce another child should also fall within a couple's procreative liberty. This action is directly procreative because it leads to the birth of a child who is formed from the egg and sperm of each spouse, even though it occurs asexually with the DNA of an existing child and not from a new union of egg and sperm.[100] Although it is novel to create a twin after one has already been born, the act still allows the couple to reproduce. The distinctly reproductive nature of their action is reinforced by the fact that they will gestate and rear the child that they clone.

The parents' precise motive for cloning and subsequent transfer to the uterus will not affect the reproductive nature of their endeavor. Whether they simply want a second child like the first, want a second child who could be a source of tissue or organs, or want to replace a dead or dying child with one with its genes, they are engaged in reproduction because another child of their genes, whom they will gestate and rear, will be born.

In this scenario, the clone source—the child—may have no right to determine whether or not she is cloned. After all, that child is not itself reproducing directly, as might occur if germ cells were removed from her and used at a later point with the egg and sperm of others. Additionally, the DNA source does not have any special responsibilities toward the resulting child (its identical twin). Children ordinarily have no right to determine whether their parents reproduce or not, even when the reproduction is posthumous.[101] If they lack the right to oppose their parents'

---

99. Cloning embryos might also be done to provide tissue or organs for transplant to an existing child.

100. Again, it might be used to create an embryo or child from whom tissue or organs might be obtained for transplant to an existing child.

101. *See* Hecht v. Superior Court, 20 Cal. Rptr. 2d 275, 290 (Ct. App. 1993) (holding that surviving children have no right to prevent artificial insemination of their deceased father's companion with stored sperm to which he gave her legal rights).

decision to have another sibling, they also should not have the right to prevent the birth of a later-born identical twin. As long as obtaining DNA from them does not involve harmful bodily intrusions, the parents should be free to use the DNA from existing children to have and rear additional children.[102]

The idea of cloning an existing child is plausibly foreseeable in several circumstances. One involves a situation in which the parents want another child and are so delighted with the existing one that they simply want to create a twin of her, rather than take a chance on the genetic lottery.[103] A second situation is one in which an existing child might need an organ or tissue transplant. A third scenario would be to clone an existing child who has died, so that it might continue to live in another form with the parents. Finally, parents may choose to clone a child who has been successfully treated with gene therapy to avoid having another child with that disease.[104]

The parental motivations in these cases are similar to parental motivations in coital reproduction. Few persons condemn parents who reproduce coitally because they want another child as lovely as their first, because either they think that a new child might be a tissue source for an existing child, or they want another child after an earlier one dies. Given that the new child is cloned from the DNA of one of their own children, cloning one's own embryos or children to achieve those goals should also be regarded as an exercise of procreative liberty and granted the special respect usually accorded to procreative choice.

c. Cloning third parties.—A couple who seeks to use the DNA of a third party should also be viewed as forming a family in a way similar to family formation through coital conception or currently accepted forms of assisted reproduction. The DNA of another might be sought in lieu of gamete or embryo donation, although it could be chosen because of the source's characteristics or because the opportunity holds special meaning to the couple. The idea of "procreating" with the DNA of another raises several questions about the meaning and scope of procreative liberty that require a more extended analysis. I begin with the initiating couple's rights or interests here and then ask whether the DNA source or her parents also have procreative interests and rights at stake.

---

102. For further discussion of these points, see *infra* note 264 and accompanying text.

103. I am grateful to a colleague for this suggestion. Other colleagues inform me, however, that they would not clone an existing child because they would want to see how the next child would differ from the first.

104. *See supra* note 49.

(1) The initiating couple's cloning rights.—We now ask whether the rights of procreation and the family formation of a couple seeking to clone another's DNA would extend to use of a third party's DNA to create a child. Whether rearing is also intended turns out to be a key distinction. Let us first consider the situation in which rearing is intended, and then the situation in which rearing is not intended.

(a) Rearing intended.—A strong case for a right to clone another person (assuming that that person and her parents have consented) arises when a married couple seeks to clone in order to have a child to rear. Stronger still is the case in which the wife will gestate the resulting embryo and commits to rear the child.[105] Is this an exercise of their procreative liberty that deserves the special protection that procreative choice generally receives?

(i) Facilitative: no other way to reproduce.—[106]The most likely requests to clone a third party would arise from couples who are not reasonably able to reproduce in other ways. For example, the couple may lack viable gametes, although the wife can gestate, and thus they are candidates for embryo donation. Rather than obtain an embryo generated by an unknown infertile couple, they through cloning could choose the genotype of the child they will carry and rear.[107]

Whose DNA might they choose? The DNA could be obtained from a friend or family member, although parents pose a problem.[108] It could come from a sperm, egg, or DNA bank that provides DNA for a fee. Perhaps famous people would be willing to part with their DNA in the same way that a sperm bank for Nobel Prize winners was once created. Rather than choose for themselves, the couple might delegate the task of choosing the genome to their doctor or to some other party.

A strong argument exists that a couple using the DNA of a third party in lieu of embryo donation is engaged in a legitimate exercise of procreative liberty. The argument rests on the view that embryo donation is a protected part of that liberty. That view rests in turn on the recognition of the right of infertile couples to use gamete donation to form a family. As

---

105. An even stronger case arises when the wife who will gestate also will provide the egg into which, after enucleation, the nuclear transfer occurs. In that case, she will be providing some genetic material through mitochondria in the cytoplasm of the egg as well. However, this scenario is not feasible if the wife or couple are candidates for egg or embryo donation because the woman lacks viable eggs.

106. Dena Davis uses the terms "logistical" and "duplicative" instead of my terms "facilitative" and "eugenic" to distinguish different reasons for cloning. Dena S. Davis, *What's Wrong With Cloning*, 38 JURIMETRICS J. 83, 85 (1997).

107. Strictly speaking, this could occur without the initiating or rearing couple actually choosing the DNA they receive, although it is likely that they will want to participate in that choice.

108. *See infra* subsection IV(B)(6)(d) (discussing the possible psychological and social difficulties arising from the rearing of a genetic replica of one's parent).

we have seen, coital infertility alone does not deprive one of the right to reproduce.[109] Infertile persons have the same interests in having and rearing offspring and are as well-equipped to rear as fertile couples. If that is so, the state could not ban infertile couples from using noncoital techniques to have children without a showing of tangible or compelling harm.[110]

This protected status is clearest when the noncoital technique—in vitro fertilization or artificial insemination with the husband's sperm—merely enables conception with the couple's gametes to occur. But it plausibly extends as well to couples who suffer a gametic insufficiency—such as very low or absent sperm count, which necessitates resort to a sperm donor, or premature menopause, which requires the use of an egg donor. In those cases, the couple intends to rear the child as their own, the wife is still gestating, and a biological connection exists with one or both members of the rearing couple and the child. Although one part of the usual genetic connection in reproduction is missing (the male in one case, the female in another), the remaining connections are substantial and justify viewing the couple's activity as part of their rights of procreation or family formation.

If the right to use egg or sperm donation is part of one's procreative liberty, then a right to use embryo donation should follow as well.[111] An embryo donation may be viewed as combining separate egg and sperm donations together, either before conception or, more commonly, after conception has occurred. In addition, embryo donation involves gestation by the rearing couple. Although the most removed of current noncoital techniques from the genetic, gestation, and rearing combinations that occur in coital reproduction, embryo donation is still closely enough related to be treated similarly. This is evident when compared to adoption, in which the adoptive couple has no genetic or gestational connection with the child whom they rear. One might thus reasonably conclude that an infertile couple has a right to engage in embryo donation unless tangible harm to others can be shown from the practice.

If embryo donation is part of an infertile couple's family or procreative liberty, then some right to select or choose the embryo or gametes that are used to form the embryo should follow. We select our mates and

109. *See* ROBERTSON, *supra* note 86, at 38-40 (arguing that because infertile couples are just as capable as fertile couples to raise children, they possess a moral right to use nonconventional techniques to reproduce).

110. *See supra* notes 89-90 and accompanying text (asserting an infertile couple's fundamental right to have children).

111. *See* John A. Robertson, *Ethical and Legal Issues in Human Embryo Donation*, 64 FERTILITY & STERILITY 885, 891-94 (1995) (arguing that embryo donation should be the legal equivalent of sperm and egg donations because in both the recipient and donor intend for the recipient to be the sole rearing parent and the donor to have no rearing role).

then decide whether or not to reproduce. Surely a couple needing a sperm or egg donor should be able to choose among available donors. Similarly, they should be free to select among donor embryos. Indeed, choice over gametes would follow from notions of procreative liberty. If forming a family by gamete or embryo donation is part of procreative liberty and choice over which gametes or embryos are used, then the right to choose gametes and embryos follows, subject to restriction only to prevent tangible harm to others.[112]

If this argument is accepted, then the right to choose DNA to clone in lieu of already created embryos or separate gamete donations should follow as part of the right to choose an embryo donation. If the couple reasonably claims that they would not proceed unless they could clone DNA, they would be asserting the right to clone another (with consent) as part of their freedom or liberty to reproduce through embryo donation.

Not all persons will accept the logic of this argument. Rather than focus on the similarity of interests and experiences, they will emphasize one or more of the missing reproductive components. Thus, some might view reproduction as necessarily involving genetic transmission and accord special protected status only when the genes of both partners are transmitted. Under that view, a biological connection through gestation and a social connection through rearing are not actually reproductive and deserve no special protection.[113] This view would accord no special reproductive protection to the use of donor sperm, donor egg, or donor embryos, much less to cloning as a form of embryo donation.

A more moderate position would regard a married couple's use of donor egg or sperm to gestate and rear a child as reproductive because one rearing partner has a genetic tie with the child. It might also protect the recipient's choice of the sperm or egg that is donated. However, it would not protect embryo donation, much less a right to choose donor embryos or to clone embryos as a form of choice, because embryo donation involves no genetic transmission by either partner. Under this view, a gestational tie and rearing are too distant genetically from the interests and values that underlie reproduction to give embryo donation or cloning third parties a protected status.

(ii) Eugenic: the meaning of the chosen genome.—A second situation involving rearing a child cloned with the consent of a third party clone source arises when a couple who is coitally fertile (or who could

112. *See* Robertson, *supra* note 91, at 426-28 (suggesting that if the right to decide whether or not to reproduce constitutes a fundamental right, then obtaining information relevant to that decision falls within that right).

113. Although the logic of this view should regard cloning as fully reproductive because it transmits all, not just half, of a person's genes, its proponents would likely claim that all reproduction is sexual and requires the joining of genes from two individuals.

reproduce noncoitally with their own gametes) prefers instead to bear and rear a child who is the clone of another person.[114] The clone source could be a parent or family member, a friend, or another whose genes they find desirable. Their claim is that they will have and rear a child only if it is cloned from the DNA of the source they have in mind. Does their procreative liberty include the right to clone and rear?

The answer here depends on how cloning as a means of embryo donation is viewed. If embryo donation, or cloning in lieu of embryo donation when infertile, is not deemed part of procreative liberty, then cloning when the couple is fertile in order to rear a child with a selected genome has no protected moral or legal status. Even though they will gestate and rear, this seems too far removed from the situations and meanings that make reproduction valued to count.

On the other hand, if embryo donation is deemed part of procreative liberty and that right includes the right to clone another in lieu of embryo donation, then a plausible argument for the right to clone another even when the initiators are themselves fertile exists. The gestational and rearing connections that make embryo donation or cloning as a method of such donation protected would exist here as well. If the couple would not reproduce coitally if they could not clone, then the ban on cloning would deprive them of the opportunity to rear a child whom they have also gestated. Only if one rejects totally the idea of a right of genetic selection, or at least positive genetic selection, would the selection of genome presented by this case be wrong.

This description of the argument for a right to clone as a form of embryo donation, or alternatives which deny that there is such a right, illustrates again the self-defining or constitutive nature of the ethical, legal, and policy choices presented by cloning and reproductive technology generally. Given certain value assumptions, one can identify logical arguments for including or not including a reproductive practice as a protected part of procreative liberty. Ultimately, however, the decision depends on an individual or social willingness to define or accept reproductive freedom as incorporating the practice. In making those definitions or choices, we end up constituting or defining what reproductive liberty means.

(b) Rearing is not intended.—The initiating couple's claim to clone the DNA of another should not be recognized as part of the couple's procreative liberty if no rearing is intended, whether or not they have other means to reproduce. In this scenario an initiator procures the DNA and enucleated eggs, has embryos created from the DNA, and then either sells

114. Cloning of one's own existing children might also occur when the couple is coitally fertile. *See supra* subsection III(B)(1)(b).

or provides the embryos to others, or commissions surrogates to gestate the embryos. The resulting children are then reared by others.

The crucial difference here is absence of intention to rear. If one is not intending to rear, then one's claim to be exercising procreative choice is much less persuasive. One is not directly reproducing because one's genes are not involved—they are not even being replicated. Nor is one gestating or rearing. Indeed, such a practice has many of the characteristics that made human cloning initially appear to be such a frightening proposition.[115] It seems to treat children like fungible commodities produced for profit without regard to their well-being. It should not be deemed part of the initiating couple's procreative liberty.

Any right to clone by persons who do not intend to rear would have to derive from the right of those who end up rearing. The initiating actors—who coordinate obtaining an egg source or DNA—would have to show that their efforts are essential or necessary for infertile couples seeking embryos to gestate and rear. If so, the couple can claim a right derivative of the right of the gestating and rearing couple to obtain or choose embryos. If their business is the production of children for adoption, they will have no derivative rights, for we have not yet recognized a right to obtain a child for rearing when there is no gestation or other biologic connection involved.[116] Therefore, there can be no derivative right to produce and provide children to persons interested in adoption.

(2) The clone source's right to be cloned.—Mention of the procreative rights of the person providing the DNA to be cloned is also relevant. I will assume that the clone source has consented to use of his DNA (whether consent is morally or legally required is discussed in a later subsection).[117] If so, does she independently have the right to have a later born genetic twin, such that a ban on cloning would violate her procreative rights as well?

The fact that she will not be rearing the child is crucial. Her claim to be cloned then is simply a claim to have another person exist in the world with her DNA (and if anonymity holds, she may never learn that her clone was born, much less ever meet her). The only interest at stake is her

---

115. *See supra* notes 81-83 and accompanying text (discussing fictional accounts portraying cloning as horrific).

116. Otherwise commissioned adoptions, in which a woman who is hired to be impregnated and who agrees to relinquish the child at birth to the hiring couple, would receive special protection. The right to acquire children for rearing might be important, but it is not reproductive when there is no genetic or gestational involvement; at present it has no moral or constitutional standing as reproductive activity. *See* ROBERTSON, *supra* note 86, at 142-44 (emphasizing the current necessity of a biological link to establish reproductive rights but imagining a time when preconceptual rearing commitments will be afforded more substantial protection).

117. *See infra* subsection V(B)(2)(a) (arguing that in most cases the consent of the gene source should be required).

interest in possibly having her DNA replicated without her gestation, rearing, or perhaps even knowledge that a twin has been born. It is difficult to argue that this is a strong procreative interest, if it is a procreative interest at all. Thus, unless she undertook to rear the resulting child, the clone source would not have a fundamental right to be cloned.

But this conclusion assumes that being cloned is not itself reproduction. One could argue that cloning is quintessentially reproductive for the clone source because her entire genome (except mitochondrial DNA) is replicated. In providing the DNA for another child, she will be continuing her DNA into another generation.[118] Given that the biological goal of sexual and asexual reproduction is the same—the continuation of one's DNA—and that individuals who are cloned might view cloning as a way of maintaining continuity with nature, we could plausibly choose to consider it a form of reproduction.

But even if we view the clone source as fully and clearly reproducing, she still is not rearing. Her claim of a right to be cloned is still a claim of a right to reproduction *tout court*—the barest and least protected form of reproduction.[119] In the absence of rearing or gestation, her claim merely to have her genes replicated will not qualify for moral or legal rights protection. If the clone source has a right to be cloned, it would have to be derivative of the initiators' right to select source DNA for the child whom they will rear.

(3) The clone source's parents' rights in cloning.—The above analysis also applies to the genetic parents of the third-party clone source. If their offspring consents to have her DNA cloned, they will end up with another daughter from their genes. If they agree to the cloning of their offspring, they will be consenting to have another genetic child.[120] In this case they will be reproducing nonsexually, but they will be reproducing all the same.[121]

The question raises again the issue of whether one has a right to engage in genetic reproduction *tout court*—transmission of genes without any rearing rights or duties, or indeed, any knowledge of a resulting child.

---

118. See the discussion of the selfish gene, *infra* note 124 and accompanying text.

119. Reproduction *tout court* (without more) refers to genetic transmission without any rearing rights or duties in the resulting child, and in some cases, without knowledge that a child has even been born. The courts have not yet determined whether engaging in or avoiding reproduction *tout court* deserves the same protection that more robust or involved forms of reproduction have. For further discussion of the concept, see ROBERTSON, *supra* note 86, at 108-09 (arguing that recognition of a fundamental right to avoid genetic reproduction *tout court* may invalidate laws that mandate donation of embryos left over from IVF programs).

120. Whether their consent is necessary, because a clone will necessarily be another genetic child of theirs, is discussed *infra* notes 191-93.

121. Whether they have a right to prevent their offspring from being cloned is discussed *infra* subsection V(B)(2)(b).

Because the source's parents have no intention of rearing the cloned twin of their earlier child and merely want the satisfaction of having their genes carried into the world by a child who will be reared by others, they probably do not have a right in themselves to have the cloning occur. Like other instances of interests in genetic reproduction *tout court*, the interest is too thin to support a strong liberty right. As it was for the clone source, the parent's right to have their adult child cloned derives exclusively from the initiator's right to clone.

d. Cloning oneself.—A fourth likely cloning scenario will involve cloning oneself. A strong case can be made that the use of one's own DNA to have and rear a child should be protected by procreative liberty.

As we have just seen, the right to clone oneself is weakest if rearing is not intended. Even if we grant that self-cloning is in some sense truly reproductive, rather than merely replicative, it would still be reproduction *tout court*, which is the most minimal and least protected form of reproduction. Thus cloning oneself with no rearing intended would have no independent claim to be an exercise of procreative liberty. If it is protected at all, cloning oneself would be derivative of the right of the couple or individual who then gestate and rear the cloned child.

The claim of a right to clone oneself is different if one plans to gestate and rear the resulting child. The situation is best viewed as a joint endeavor of the couple. As in embryo donation, the couple would gestate and rear the child. In this case, however, there would be a genetic relation between one of the rearing partners and the child—the relation of a later-born identical twin.

If the man's DNA is cloned and the wife provides the egg as well as the place for gestation, then each will have a genetic connection with the child (because of the cytoplasmic mitochondrial DNA in the egg). If the wife does not provide the egg but gestates, the child will have a genetic connection with one rearing partner and a gestational connection with the other. If the wife is the source of the DNA, then the husband will have no genetic or biologic connection with the child—the same situation that arises when a couple uses donor sperm. Although novel, the outcome in all of these cases closely resembles the outcomes of coital reproduction and gamete donation and should be treated equivalently. Procreative liberty, broadly construed to include efforts by a couple to gestate and rear offspring biologically related to at least one of them, should thus include the right to have and rear a later-born twin.

The idea of a right to parent one's own later-born sibling is also plausibly viewed as a variation on the right to use a gamete donor. If such a right exists, it logically follows that the couple would have the right to choose the gametes or gamete source they wish to use. A right to use their

own DNA to have a child which they then rear should follow. Using one's own DNA has distinct advantages over purchasing gametes from commercial sperm banks or paid egg donors: one is more clearly continuing her own genetic line, one knows the gene source, and one is not buying gametes. Some couples might plausibly insist that they would have a family only if they could clone one of themselves because they are leery of the gametes of anonymous strangers.[122]

One might also argue for a right to have and rear one's own identical twin—the right to clone oneself—as a direct exercise of the right to reproduce. If one is free to reproduce, then one should also have the right to be cloned because the genetic replication involved in cloning is directly and quintessentially reproductive. Duplicating all of one's DNA by nuclear cell transfer enables him to survive longer than if cloning did not occur. To use Richard Dawkins's evocative term, it is in the interest of the "selfish gene" to survive as long as possible,[123] and cloning helps accomplish that task.[124] If rearing is intended, a person's procreative liberty should then include the right to clone oneself. Only tangible harm to the child or others would then justify restrictions on self-cloning.

Some persons may reject the logic of reproductive interests and rights presented here. One could take the position that replication is distinctly not reproduction because no union of DNA from two existing individuals occurs. One could also deny the existence of a right to engage in gamete donation or to choose the gametes used in noncoital reproduction. If so, a right to use one's own DNA to have and rear a child would also be rejected. Doing so, however, creates a danger that accepted practices to treat infertility, like sperm and egg donation, will receive less protection than they do now. Having and rearing one's own genetic twin is similar to many practices that now occur in assisted reproduction and deserves the same protection.

2. Constituting Procreative Liberty.—The preceding analysis has explored plausible arguments for finding that cloning is directly involved with procreative liberty in situations in which the couple initiating the cloning intends to rear the resulting child. This protected interest is

---

122. Of course, this means that the other partner will not have a DNA connection with the child she rears, unless she also provides the egg and mitochondria.

123. RICHARD DAWKINS, THE SELFISH GENE 3 (new ed. 1989) (arguing that humans are biologically selfish creatures and must be taught generosity and altruism).

124. In the long run, cloning might not be adaptive, because genetic diversity is needed for long-term survival. However, if the alternative is no genetic continuation at all, say because no reproduction occurs or a gamete donor is chosen, then cloning increases the chance of long-term survival of the cloned DNA more than no cloning at all. Richard Dawkins would clone himself out of pure curiosity: "I find it a personally riveting thought that I could watch a small copy of myself . . . nurtured through the early decades of the twenty-first century." Peter Steinfels, *Beliefs*, N.Y. TIMES, July 12, 1997, at A9 (quoting Richard Dawkins).

perhaps clearest when they are splitting embryos or using DNA from their own embryos or children, but it also exists when one of the rearing partner's DNA is used. Using the DNA of another person is less directly reproductive, but still maintains a gestational connection between the cloned child and its rearing parents, as now occurs in embryo donation.

In considering the relation between cloning and procreative liberty, we see once again how blurred the meanings of reproduction, family, parenting, and children become as we move away from sexual reproduction involving a couple's egg and sperm. Blurred meanings, however, can be clarified. The test must be how closely the marginal or deviant case is connected with the core. Applying this test elucidates several plausible cases involving a couple who seeks to clone the DNA of embryos, their existing children, themselves, or consenting third parties, each of which is sufficiently connected with the core so as to fall within the scope of procreative liberty. In all of these instances the couple will be seeking a child whom they will gestate and rear. Unless all selection is to be removed from reproduction, the couple's interest in selecting the genes of their children deserves the same protection accorded other reproductive choices.

It is not necessary to be convinced by all aspects of this argument to grant its effect. A strong presumption in favor of individual choice is essential in procreative matters because they are so intimate and personal, and so fraught with meaning for our lives and those around us, that only the individuals and couples directly involved can decide whether to go forward. One need not personally accept all the ways of achieving reproductive goals to still recognize that choice must be presumptively left to the individuals directly involved. Some instances in which children would be cloned so closely resemble distinctively reproductive methods that individual freedom to clone and rear in those cases should also be respected.

The root of the problem is the uncertain meaning assigned to genes in determining whether reproduction has occurred. Always relevant, sometimes genes are determinative and sometimes they are not. Genes may be a necessary condition, but they are never sufficient for determining whether the distinctively procreative is at stake. In making intent to rear (and gestate) so significant, reproduction is defined in terms of *some* biologic connection plus rearing. We do no great violence to prevailing understandings of procreative choice when we recognize DNA cloning to produce children whom we will rear as a legitimate form of family or procreative choice. Whether we wish to allow families to be formed in this way will then depend upon whether cloning imposes such significant harm on others that this valid method of family formation should be restricted.

IV. The Harms of Human Cloning

The initial response to the idea of cloning humans has been overwhelmingly negative, with many persons, politicians, religious bodies, and advisory commissions calling for its prohibition.[125] Some find it repugnant because it denies the essence of being human or threatens the individuality and uniqueness of resulting children. Others stress threats to autonomy caused by rigid parental expectations or the risks of physically unsafe experimentation. Still others believe that cloning will confuse traditional notions of kinship and lineage, which are so key to our sense of self and our place in the world. Finally, there are fears of the slippery slope: permitting cloning in even limited cases might inevitably lead to abusive scenarios or make it impossible to stop the onslaught of genetic manipulation and engineering of offspring that future technologies could make possible.

Many of these objections to human cloning were made in the abstract or with the fantasy scenarios of instant replication of all-determining genes in mind. Even when popular images of cloning are put to rest, grave concerns about the welfare of resulting children persist. Having examined more realistic situations in which cloning, if shown to be safe and effective in humans, is likely to be used and cloning's connection with prevailing conceptions of procreative freedom, it is time to analyze claims of harm to see whether they constitute a sufficient basis for banning or severely restricting human cloning.[126]

The following section will consider the main objections to human cloning in light of its likely use in family formation. The question to be addressed is whether the feared harm is sufficient in itself or in conjunction with other harms to justify prohibition or severe restriction of human cloning. Views as to the sufficiency of the alleged harms are, of course, intimately connected with assessments of whether cloning is so closely involved with reproductive choice that it should be protected from governmental intervention except in cases of compelling harm.

If protected uses of cloning are not involved, then most of the fears raised about cloning will suffice to justify a ban or other regulation. Government may generally restrict liberty if it has a rational basis for action, and the concerns raised about cloning are rational concerns that may properly inform public policy as long as they do not infringe on fundamental liberties. Of course, whether those social or community

---

125. *See supra* notes 2-6 and accompanying text (discussing political proposals for banning human cloning).

126. Less drastic regulation of human cloning to protect against specific harmful abuses of cloning technology is discussed *infra* subpart V(B). The following analysis here in Part IV explores whether the alleged harms are sufficiently compelling to permit the government to prohibit cloning entirely.

concerns are worth pursuing at the price of nonfundamental liberty interests will remain a contested issue of public policy. But if the most likely uses of cloning will enable couples to form families in ways that are reasonably viewed as exercises of procreative liberty, then concerns regarding the harms of cloning will have to reach a higher level than mere rationality to justify overriding individual choice.

A. *The Problem of Wrongful Life*

Most of the harms said to flow from human cloning focus on the welfare of children who are given the same DNA as another individual. Whether the feared harm is physical safety, individuality, autonomy, instrumentalization, or threats to lineage, all are claims that the child who results is intrinsically or irrevocably harmed by the experience and, thus, that the best policy would be to prevent cloning from occurring to prevent the harm that the resulting child would experience.

Such claims have wide appeal, but they raise a central conceptual problem that calls into question whether preventing harm to offspring ever justifies preventing their birth altogether. The problem arises because, but for the technique in question, the cloned person would not exist. Banning the technique may prevent a child from being born into the circumstances of concern, but it does so, not by assuring that it is born in different circumstances, but by preventing it from being born at all.

Preventing existence as a way to prevent harm to the person who would exist makes sense for that person only if it reasonably appears that once born, the child's existence would be so full of pain and suffering that its interests would be best served by nonexistence.[127] But it is rare that the techniques at issue—whether cloning or other genetic manipulations—would cause harm or suffering to such an extent. The strongest case would be a child born with Tay Sachs disease, who after six months or so of normal development, begins a progression toward inevitable death at about two years. Other genetic defects, such as sickle cell anemia, cystic fibrosis, or Down's Syndrome, do not have such devastating effects that a child born with those conditions would be better off, from its own perspective, never living at all. None of the assisted reproductive

127. David Heyd, who argues that one cannot be benefitted or burdened by being born, would formulate the point differently. He would argue that even though one is not benefitted or burdened by being born, once born, one's interests would support, depending on the circumstances, either continued life or the cessation of life. Thus, one should not speak of interests in being born or avoiding being born, but whether, once born, one has interests in continued life. *See* DAVID HEYD, GENETHICS: MORAL ISSUES IN THE CREATION OF PERSONS 124 (1992). Whether one accepts Heyd's version or the version in the text, the text's conclusion provides that the most likely uses of cloning or other reproductive technologies would not lead to a life so full of net suffering that a person's interest, once born, would be to die.

techniques, including those using donors and surrogates, lead to a child whose life would be invariably full of such great suffering that it too never should be born. Nor is being born with the DNA of another likely to have such devastating effects on the child that it is better off, once it exists, in not continuing life.

There have been two main responses by those who reject the implications of this position.[128] One is to deny its premises; the other is to grant it but find reasons other than concern about offspring welfare for calling the birth wrongful. The first strategy—denying the argument's premises and conclusion—is commonly asserted in bioethical writing, but there is usually little argument or analysis, and when there is, it usually misses or confuses key steps in the argument.[129]

An exception to the lack of analytic rigor are the views of philosophers Derek Parfit and Dan Brock, who would replace an individual or person-based notion of harm, on which my argument rests, with a class-based notion.[130] Yet even they acknowledge that the notion of harm to a class, rather than to an individual, can be sustained only if the number of the members of the class is kept constant—for example, when a member of the class of all children born, who has a defect such as cloning, can be

---

128. Tort law in the United States has almost universally rejected claims of wrongful life based on the birth of a child who could not have existed but with the condition of concern. *See, e.g.*, Smith v. Cote, 513 A.2d 341, 351-55 (N.H. 1986); Becker v. Schwartz, 386 N.E.2d 807, 811-12 (N.Y. 1978); Nelson v. Krusen, 678 S.W.2d 918, 924-25 (Tex. 1984) (all refusing to recognize a cause of action for wrongful life because, to assess injury in such an action, the court would be compelled to engage in a subjective calculation of the relative value of the plaintiff's impaired life versus the allegedly higher value of nonexistence). However, the California, Washington, and New Jersey supreme courts have allowed children to recover special, but not general, damages on a claim of wrongful life in situations in which their parents were able to recover both special and general damages for the child's birth. *See* Turpin v. Sortini, 643 P.2d 954, 959-66 (Cal. 1982); Procanik v. Cillo, 478 A.2d 755, 760-63 (N.J. 1984); Harbeson v. Parke-Davis, 656 P.2d 483, 494-97 (Wash. 1983) (all finding a cause of action based largely on the desire to avoid the anomaly of permitting only the parents, and not the child, to recover for the cost of the child's own medical care). The results in these cases, however, do not show support generally for a tort of wrongful life because they do not allow the child to recover for general damages, which should be awarded if her life is truly wrongful. The cases are best understood as a means to assure that the tortfeasor internalizes the full costs of the tort.

129. *See, e.g.*, Cynthia B. Cohen, *"Give Me Children or I Shall Die!": New Reproductive Technologies and Harm To Children*, HASTINGS CTR. REP., Mar.-Apr. 1996, at 19; Dena S. Davis, *Genetic Dilemmas and the Child's Right To an Open Future*, HASTINGS CTR. REP., Mar.-Apr. 1997, at 7; Ronald M. Green, *Parental Autonomy and the Obligation Not to Harm One's Child Genetically*, 25 J.L. MED. & HEALTH CARE 5, 7-8, 11-13 (1997) (each defending on various grounds the theory that children are harmed by technologies that allow them to be born, but only in a "disabled" state). A more rigorous account of this opposing view is found in Bonnie Steinbock & Ron McClamrock, *When is Birth Unfair To the Child?*, HASTINGS CTR. REP., Nov.-Dec. 1994, at 15, but they are inconsistent in not recognizing that the child whose existence they claim is unfair would not otherwise be born if the circumstance or practice in question did not exist.

130. *See* DEREK PARFIT, REASONS AND PERSONS 396-401, 487-90 (1984); Dan W. Brock, *The Non-Identity Problem and Genetic Harms—The Case of Wrongful Handicaps*, 9 BIOETHICS 269, 271-75 (1995) (both arguing that causing the birth of a disabled child can wrong children as a class even though it does not harm that particular child to be born).

replaced with another child without that defect.[131] If that condition cannot be met, they admit that they have not shown that the person-regarding concept of harm fails.[132] But the couple seeking to have the cloned child ordinarily cannot have another healthy child, or they would not have resorted to cloning in the first place.

A different strategy is to accept the argument but assert that the child's birth was harmful for reasons other than the welfare of the child per se. Here the response comes close to asserting that the offense that others feel because less than normal children are born is a sufficient ground for preventing couples from producing such children. But an argument based on offense still seems to rest either on the assumption that the child would have been better off never being born at all, or that the parents are acting without regard for the child's welfare.

Proponents of the wrongful life theory may also think that the parents could have easily had another "non-defective" child. But this too overlooks the interests of the child who is now born, albeit with the defect or condition in question. From the now existing child's perspective—the perspective of *this* particular child—it is not harmed by existence, because it has no alternative to existing with the defect or condition of concern, and it finds its current existence, being the only one available to it, very fine indeed. Moreover, the argument assumes that the parents who intentionally bring a disabled child into the world have no concern for that child. If they are prepared to rear and love it regardless of its condition, it is wrong to say that its birth denigrates respect for life or persons.

An added problem is that proponents of this response seem unaware of the implications of their position. If their claim that parents act wrongfully when they knowingly allow children to be born in some less than ideal or normal condition, then parents in many situations would be acting wrongfully. The underlying principle on which their claim rests would condemn women who, after prenatal diagnosis, test positive for Down's syndrome, cystic fibrosis, or Tay Sachs and then refuse to abort, or who refuse testing after getting pregnant when they know that there is a one-in-four risk of having a child with severe genetic disease, or who refuse carrier screening in the first place. These decisions are much more likely to cause the birth of children with special problems or conditions than assisted reproduction or cloning. Surely offense alone that one would knowingly bring a disabled or handicapped child into the world is not a sufficient basis for prohibiting couples from making that choice, at least when they plan to rear the child themselves and have the resources to do so.

131. *See* PARFIT, *supra* note 130, at 366-71; Brock, *supra* note 130, at 271-75.
132. *See* PARFIT, *supra* note 130, at 366-71; Brock, *supra* note 130, at 271-75.