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HUMAN CLONING: BRAVE NEW MISTAKE

*Sophia Kolehmainen**

I. INTRODUCTION

Until recently, discussions about human cloning were conducted within the realm of science fiction and fantasy. However, with the successful cloning of the sheep "Dolly" in 1997, it became evident that sooner or later, scientists might be able to clone human beings too.[1] This possibility has incited both support and opposition.[2] Newspapers and magazines have described cloning as an exciting step forward that allows genetic engineers to reduce the uncertainties of reproduction, but they have also published commentaries by scientists, religious figures, and others who see human cloning as an attack on human dignity.[3] This Essay focuses on whether we as a society should accept human cloning by somatic cell nuclear transfer to create offspring.[4]

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1. *See* LEE M. SILVER, REMAKING EDEN: HOW GENETIC ENGINEERING AND CLONING WILL TRANSFORM THE AMERICAN FAMILY 108-10 (1998).

2. *See* Ronald Bailey, *What Exactly Is Wrong with Cloning People?*, *in* THE HUMAN CLONING DEBATE 181, 182-87 (Glenn McGee ed., 1998) (presenting opposing views on cloning).

3. *See, e.g.*, Charles Krauthammer, *Of Headless Mice . . . and Men*, TIME, Jan. 19, 1998, at 76, 76 (explaining why we as a society should be concerned over the possibility that humans may be cloned in the future); Nathon Myhrvoid, *Human Clones: Why Not?*, SLATE (March 13, 1997), *available at* <http://www.slate.com>.

4. Cloning raises many issues which are not discussed here, but which are similarly worthy of public debate including: using cloning for the purposes of creating organs for transplantation, cloning existing embryos through embryo division, the cloning of animals, and the acceptability of other non-cloning manipulations of human embryos.

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II. CLONING: THE SCIENCE OF CONTROVERSY

Somatic cell nuclear transfer is the cloning technique that the Scottish scientists used to produce Dolly.[5] It involves the removal of deoxyribonucleic acid ("DNA") from an egg cell and fusion of that enucleated egg with a differentiated cell from an already existing organism, like a skin cell, or in the case of Dolly, a mammary cell from a sheep which had been dead for six years.[6] The Scottish scientists found that fusing the two cells with an electric shock triggered a "reprogramming" which caused the combined egg-mammary cell to divide and mature like an early embryo.[7]

Cloning technology developed as a way to improve the production of genetically engineered animals. There are huge financial profits to be made by developing genetically engineered animals that secrete chemicals and proteins of value to humans, such as cows or goats that produce human blood clotting agents in their milk.[8] Without cloning, scientists must genetically manipulate each individual animal, which results in very low success rates. However, with cloning comes the possibility that scientists need only perfect one animal to clone an entire herd from that success. The goal is not to copy everything about the animal, but only the property that has been engineered into it. The desire of some genetic engineers to gain control over the innermost workings of animals fueled the further development of cloning technology. It is out of this context that some people are now attempting to justify human cloning.

The transfer of cloning techniques to humans, however, creates a host of unique technical, ethical, and social issues that are not currently raised in the cloning of animals.[9] Whereas the point of cloning animals is to create more economically efficient bio-factories of identical animals with value to humans, cloning humans is being suggested as a procreative technique to copy existing people.[10]

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

6. *See* Potter Wickware, *History and Technique of Cloning*, *in* THE HUMAN CLONING DEBATE, *supra* note 2, at 17, 17.

7. *See* John A. Robertson, *Liberty, Identity, and Human Cloning*, 76 TEX. L. REV. 1371, 1374 (1998).

8. *Cf.* Ruth Hubbard, *Irreplaceable Ewe*, NATION, Mar. 24, 1997, at 4, 4 (explaining how genetic engineers plan to use cloning to replicate animals so that they may one day become "lucrative living factories" for humans in need of organs).

9. *See* Elliott N. Dorff, *Human Cloning: A Jewish Perspective*, 8 S. CAL. INTERDISC. L.J. 117, 117 (1998) (discussing the moral issues involved in human cloning).

10. *See* Robertson, *supra* note 7, at 1401-02.

A. *False Perceptions of Cloning*

In 1998, reporters covered Richard Seed's declaration that he intended to raise the funds to produce two to three copies of himself through cloning.[11] This announcement illustrates the false view held by many that cloning will result in exact copies of existing or dead individuals.[12] This is just not true. The cloning process would never produce an exact copy of the cloned person.[13] Though an individual manufactured by cloning would posses the same genetic sequence as the person whose nucleus was used, other factors also substantially affect the development of an individual.[14] An individual's development may be affected by structural and metabolic influences of the enucleated egg and the differentiated cell, as well as influences during gestation. In addition, non-genetic factors such as nutrition, home environment, education, economic situation, and culture add significantly to the development of personhood.[15] Just as with animals, cloning humans will never produce exact copies.

Other false views persist in the language of cloning, namely in equating cloning with reproduction, and also with the birth of identical twins.[16] A cloned individual would be one created by scientists using a pre-existing genetic configuration, without the joining of gametes from two people.[17] The cloning process is not sexual reproduction, but is more akin to asexual replication of organisms that simply split in two.[18] The production of a clone is vastly different from the process by which twins are born. So-called identical twins, though genetically identical to

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11. *See* Wendy Cole, *Seed of Controversy*, TIME, Jan. 11, 1999, at 77, 77; J. Madeleine Nash, *Cloning's Kevorkian*, TIME, Jan. 19, 1998, at 58, 58; Gene Weingarten, *Strange Egg*, WASH. POST, Jan. 25, 1998, at F1.

12. *See* 1 NATIONAL BIOETHICS ADVISORY COMM'N, CLONING HUMAN BEINGS: REPORT AND RECOMMENDATIONS OF THE NATIONAL BIOETHICS ADVISORY COMMISSION 33 (1997) [hereinafter CLONING HUMAN BEINGS] ("Thus the idea that one could make through somatic cell nuclear transfer a team of Michael Jordans, a physics department of Albert Einsteins, or an opera chorus of Luciano Pavarottis is simply false.").

13. *See* Kenton Abel, *1997 California Legislative Service 688 (West)-Human Cloning*, 13 BERKELEY TECH. L.J. 465, 475 (1998) ("[T]he belief that genes alone determine all aspects of a person is false.").

14. *See* John A. Robertson, *Genetic Selection of Offspring Characteristics*, 76 B.U. L. REV. 421, 437 (1996). For an outline of factors which differentiate a cloned child from the original, see Robertson, *supra* note 7, at 1413.

15. *See* Robertson, *supra* note 7, at 1412.

16. *See* Nancy L. Segal, *Behavioral Aspects of Intergenerational Human Cloning: What Twins Tell Us*, 38 JURIMETRICS 57, 58 (1997) ("Identical twins are clones, but clones are not identical twins.").

17. *See* Robertson, *supra* note 7, at 1374.

18. *See id.*

one another, have two genetic parents, and are still biologically unprecedented in that their genetic configuration has never existed before.[19]

B. *Brave New Mistake*

It would be a mistake to develop and use cloning as a technique to replicate human beings. It is questionable what benefits would be gained from the successful creation of a cloned human being, if any, and whether they would justify the radical impact cloning would have on our society. Cloning is not just another reproductive technology that should be made available to those who choose to use it, but is an unnecessary and dangerous departure from evolutionary processes and social practices that have developed over millions of years. As with many other developments in biotechnology, some scientists and commentators are asking us to accept cloning of humans solely because it is technically possible;[20] however there are few good reasons to develop the technology, and many reasons to prohibit it.

1. Safety Concerns

The most frequently stated argument against cloning is based on safety concerns.[21] After the news of Dolly, President William J. Clinton convened the National Bioethics Advisory Commission ("NBAC") to review the legal and ethical issues of the potential cloning of a human.[22] The NBAC heard testimony and read opinions on the multitude of complex issues surrounding human cloning, but in the end, the NBAC based its recommendation for a three to five year moratorium on human cloning in the United States on safety concerns.[23]

At this point in the process of experimentation with cloning, safety is an important concern. The production of Dolly required at least 276 failed attempts.[24] No one knows why these attempts failed and why one

19. *See* Michael A. Goldman, *Human Cloning: Science Fact and Fiction*, 8 S. CAL. INTERDISC. L.J. 103, 112-13 (1998) (explaining that in reproductive events, such as embryo splitting, new configurations of genes arise in a process referred to as the "meiotic process").

20. *See id.* at 114 ("Many people now consider human cloning to be just another reproductive technology . . . we will soon accept.").

21. *See* Judith F. Daar, *The Future of Human Cloning: Prescient Lessons from Medical Ethics Past*, 8 S. CAL. INTERDISC. L.J. 167, 174 (1998) (explaining how individuals warning against the dangers of human cloning list safety concerns as one of the primary reasons for why the technique should be prohibited).

22. *See* CLONING HUMAN BEINGS, *supra* note 12, at i.

23. *See id.* at iv.

24. *See id.* at 61 (explaining the fact that the technique which produced Dolly succeeded in

succeeded. Cloning presents different obstacles in every species, as embryo implantation, development, and gestation differ among different species.[25] Human cloning therefore could not become a reality without extensive human experimentation. Though 276 "failed" lambs may be acceptable losses, the ethical implications of failed or partially successful human experiments are unacceptable.

Inhibitions concerning human experimentation would seem to be an impassable ethical and practical barrier to human cloning, but there may come a time when scientists feel they have enough knowledge from animal experiments to proceed with human trials. Even if questions of safety could be eliminated, which is highly unlikely, or if public opinion and scientific hubris were to reach the point where the risks associated with human experimentation seemed less egregious, human cloning should still be prohibited for several reasons.

2. Commodification

Cloning would encourage the commodification of humans.[26] Though industrialized societies commodify human labor and human lives, the biological commodification involved in human cloning would be of a vastly different order. Cloning would turn procreation into a manufacturing process, where human characteristics become added options and children, objects of deliberate design.[27] This process of commodification needs to be actively opposed. It produces no benefits and it undermines the very basis of our established notions of human individuality and dignity.

3. Human Diversity

Cloning would also disrespect human diversity in ethnicity and ability. Though it is not possible to produce exact copies of animals or people, inherent in cloning is the desire to do so. The process of cloning would necessarily increase conformity, and eradicate genetic variety.[28] A society that supported cloning as an acceptable procreative technique would imply that variety is not important. Especially in a multicultural

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one out of 277 attempts).

25. *See id.* at 16-29.

26. *See* Leon R. Kass, *The Wisdom of Repugnance*, NEW REPUBLIC, June 2, 1997, at 17, 23 (discussing how, if human cloning were to be accepted, it "would be taking a major step into making man himself simply another one of the man-made things").

27. *See id.*

28. *See* Lori B. Andrews, *Is There a Right to Clone? Constitutional Challenges to Bans on Human Cloning*, 11 HARV. J.L. & TECH. 643, 656 (1998) (contending that if the cloning of humans is allowed, it will result in the disruption of evolution by endorsing genetic uniformity).

nation like the United States, where diversity and difference are of the essence, any procedure that reduced our acceptance of differences would be dangerous. It is clear from the tensions that exist in our society that we should be embracing processes that increase our appreciation for the diversity of individuals, not working to remove differences.

4. Lack of Genetic Variation

The process of cloning would inevitably invite the use of other genetic technologies, specifically genetic manipulation of cloned embryos, which could result in permanent, heritable changes to the human gene pool.[29] Some scientists pretend that they can predict which genes humans would be better off without. However, there is no way to acquire the requisite genetic knowledge to make such a prediction without experimental genetic manipulation, which would have implications for subsequent generations. Such experiments must not be done, since both the errors and supposed successes of genetic manipulation would be with humanity forever. Although the potential applications of human genetic engineering may appeal to some, the experimental nature of the technique and the permanence of the results would make it a highly dangerous innovation.

5. Threat of Eugenics

Cloning would allow for genetic manipulation that sets the stage for increased efforts at eugenics.[30] Eugenics is the attempt to improve human beings, not by improving their economic, social, and educational opportunities, but by altering the genes with which they are born.[31] Cloning would allow scientists to begin with a known human prototype (the person to be cloned) and then "improve" it by modifying specific traits. People who wanted to be cloned could have themselves cloned only to be taller, blonder, smarter. The threat of eugenics is inherent in technologies that allow individuals to try to modify inherited characteristics so as to give preference to specific ones. It would be impossible to embark on human cloning without opening the door to eugenics. After all, the cloning of animals by "improving" their inherited characteristics

29. *See* Daniel R. Heimbach, *Cloning Humans: Dangerous, Unjustifiable, and Genuinely Immoral*, 32 VAL. U. L. REV. 633, 635 (1998) (discussing how cloning would increase the vulnerability of humans with respect to mutating diseases that are infectious, and that such a threat can only grow as cloning reduces the diversity in the gene pools of humans).

30. *See* Dinah Shelton, *Challenges to the Future of Civil and Political Rights*, 55 WASH. & LEE L. REV. 669, 675 (1998) ("Genetic mapping and diagnostics raise the specter of eugenics.").

31. *See* Julia Walsh, *Reproductive Rights and the Human Genome Project*, 4 S. CAL. REV. L. & WOMEN'S STUD. 145, 151 n.35 (1994).

is a deliberate form of animal eugenics.

6. Natural Procreation and Evolution

Ordinary procreation, whether it results in twins or singletons, is an open-ended process that depends on the random coming together of an egg and sperm cell. Each new individual has a unique configuration of genes which leads to an amazing range of human variability.[32] Cloning forecloses the opportunity for genetic surprise and growth among cloned humans, limiting such future people to genetic configurations that have been expressed before.

C. Cloning Is Not A Reproductive Answer

The discussion above provides a strong basis to support a prohibition on human cloning. Cloning developed in the context of animal commodification and the technique's intent and purposes are not applicable in humans. Even setting aside the fact that cloning cannot produce exact copies, and that it cannot go forward without much prior human experiment, the above arguments weigh heavily against ever allowing the cloning of humans.

In addition, there are no clear, defensible arguments in favor of offering cloning as an option for producing offspring. Cloning is endorsed by some as a procreative technique that provides a cure to infertility or an option for people who have genes they do not want to pass on, and the chance to have genetically related offspring for gay and lesbian couples or people without partners.[33] Such arguments are not convincing.

Their flaws stem from the fallacy of their premise and their neglect of the availability of other, less questionable options. First, if cloning were in fact a "cure" for infertility, then infertility would no longer exist. Newborns, elderly people, women who have had complete hysterectomies, and people born without ovaries or testes would all be able to bear offspring. In reality, cloning does nothing to alleviate the underlying environmental and social causes of infertility. Labeling cloning as a cure for infertility implies the acceptance of entirely new definitions of fertility and infertility, and is therefore misleading. Technically, cloning

32. *See* RICHARD A. POSNER, SEX AND REASON 89 (1992) (discussing the fact that with sexual reproduction, genetic diversity increases as "the genes are reshuffled every generation").

33. *See* John A. Robertson, *Two Models of Human Cloning*, 27 HOFSTRA L. REV. 609, 633-37 (1999) (discussing the attractiveness of human cloning to the gay and lesbian community).

is a replication of that which already exists. It is not a "cure" for anything.[34]

Current reproductive technologies offer couples who have genes they do not want to pass on, or gays, lesbians, and people without partners, an array of alternatives to cloning. People can choose genetic testing to avoid transmitting certain genes to their offspring.[35] Lesbians, gays, and unpartnered people can acquire sperm, eggs, embryos, and gestational ("surrogate") mothers.[36] Adoption is another option.

Problems associated with rising rates of infertility will not be solved through the development of high-tech, invasive, and expensive interventions. Even now, rather than answering the needs of people unable to reproduce, many of the new technologies used in assisted reproduction actually create needs and make it increasingly difficult for people to accept other, less complex and invasive solutions.[37] The psychological problems associated with infertility are created by societal as well as by personal pressures, and should be understood and dealt with at that level.[38]

Some proponents of human cloning who recognize the weakness of their arguments continue to support the development of human cloning under the banner of freedom—freedom of reproductive choice and freedom of scientific inquiry.[39] They argue that people should have the choice to produce offspring in this way, and scientists should have the option to explore human cloning without outside interference.[40] With these arguments, proponents of human cloning are able to side-step the

34. *See* George J. Annas, *Human Cloning: A Choice or an Echo?*, 23 U. DAYTON L. REV. 247, 256 (1998) (calling cloning "an evolutionary dead end that can only replicate what already exists—not improve it").

35. *Cf.* Robertson, *supra* note 14, at 476 (discussing how a community that is eugenically-inclined could offer individuals genetic testing to make them aware of any children that may be born with genetic disease).

36. *Cf.* Andrea L. Bonnicksen, *Creating a Clone in Ninety Days: In Search of a Cloning Policy*, 38 JURIMETRICS 23, 28 (1997) ("With donated eggs, sperm, embryos, as well as surrogacy and adoption available as alternatives for infertile people, cloning would be a luxury, not a necessity.").

37. *See* Lisa Sowle Cahill, *Moral Traditions, Ethical Languages*, 14 J. MED. PHIL. 497, 519 (1990) (discussing how donor methods of assisted reproduction may create a situation in which children's "natural relation of offspring to parent is . . . impaired").

38. *See* Lori B. Andrews & Lisa Douglass, *Alternative Reproduction*, 65 S. CAL. L. REV. 623, 627 (1991) (explaining how, while an adopted child can fulfill a couple's desire to parent a child, society continues to favor genetic and biological relatedness).

39. *See* Robertson, *supra* note 7, at 1391 (contending that there is a strong argument that certain types of cloning fall within prevailing notions of procreative freedom).

40. *Cf. id.* at 1435 (arguing that while there may be good reason not to utilize federal funds for the support of human cloning research, the private sector should be permitted to continue).

lack of clear benefits of this technology by raising a banner for "freedom" and "choice."

The ill-defined boundaries of a person's right to procreative autonomy makes some people cautious about prohibiting cloning. The NBAC report noted that a prohibition on cloning would be in tension with the fundamental right to procreate.[41] The right to privacy and some level of autonomy in decision-making about procreation can be traced through a series of Supreme Court decisions.[42] Generally speaking, this line of cases supports the notion that the decision whether to bear or not to bear a child is one which is of the most personal and private nature, and should therefore be made without governmental interference.[43] Some cloning proponents have extended this right to mean that the government has an obligation to support the development of all techniques that may help citizens reproduce.

This is an improper expansion of the right to be free from governmental interference in reproductive decision-making. A prohibition on cloning does not interfere with that right because the government does not have the obligation to ensure that each citizen who wants a child has a child. The right covers only the right of individuals, who can reproduce, to reproduce (or not) without government interference. Providing and safe-guarding the option to clone under the guise of reproductive freedom, in the face of the numerous negative implications of the technology, is not an acceptable justification to support the technique.

Another argument used to counter a prohibition on cloning is that it would stifle scientific inquiry.[44] But, science is not an unbiased, objective field of study, and not all scientific possibilities need be accepted by society. Scientific research is conducted by people with personal and

41. *See* CLONING HUMAN BEINGS, *supra* note 12, at ii-iii (discussing how there are legitimate justifications for a ban on human cloning even though such efforts can be regarded as an exercise of a "fundamental right to attempt to procreate").

42. *See* Planned Parenthood v. Casey, 505 U.S. 833, 851 (1992) (declaring that the decision to bear a child is a fundamental right); Carey v. Population Servs. Int'l, 431 U.S. 678, 685 (1977) (stating that decisions relating to whether or not one should utilize or prevent contraception are of the most private and sensitive to be protected from unwarranted governmental intrusion); Roe v. Wade, 410 U.S. 113, 153 (1973) (declaring that the right to privacy includes decisions relating to whether or not to terminate a pregnancy); Eisenstadt v. Baird, 405 U.S. 438, 453 (1972) (holding that the right to privacy includes decisions related to "whether to bear or beget a child"); Griswold v. Connecticut, 381 U.S. 479, 485 (1965) (striking down a law banning the use of contraceptives); Skinner v. Oklahoma, 316 U.S. 535, 541 (1942) ("[P]rocreation [is] fundamental to the very existence and survival of the race.").

43. *See Planned Parenthood*, 505 U.S. at 851.

44. *See* Declan Butler & Meredith Wadman, *Calls for Cloning Ban Sell Science Short*, 386 NATURE 8, 8 (1997) (discussing the concern of some scientists that legislating too quickly on cloning techniques may hinder innovative research).

professional interests in the outcome and continuation of their work.[45] It is often motivated by a quest for profits and power.[46] A prohibition on human cloning may indeed make it more difficult for scientists to study some inherited genetic diseases, though that is far from clear. However, allowing cloning in order to meet this hypothetical need would radically alter our current concepts of humanity and of procreation. Not all scientific inquiry has equal priority and the question should be who gets to set the priorities: scientists, their funders, or the public. Like other publicly supported activities, science must serve the public interest and the public should have the power to influence decisions about which paths are worth exploring.[47]

III. CONCLUSION

The cloning debate, like the debates surrounding the introduction of many of the new genetic technologies, often reflects the proposition that if science can do something, it should be done. Scientists introduce new technologies with inflated promises of potentially solving the world's problems—genetically engineered crops to end world hunger, or mapping the human genome so as to end disease. Researchers and their investors promote these technologies without proof of actual benefit or lack of harm. In reality, many of these "miracle" inventions could cause harm, and to date few of the promised benefits have been realized.[48]

Human cloning represents another one of these false "miracles." It would cure no disease while it would markedly alter our relationships to each other and the natural world. Human cloning cannot proceed without crossing numerous ethical boundaries. With no identifiable benefit to the technique, existing social and legal arguments against it should

45. *Cf.* Hubbard, *supra* note 8, at 4 (discussing genetic engineers who developed a new process for replicating mammals and that such a process could eventually be used to replicate organs for human use).

46. *See* Ann Alpers & Bernard Lo, *Commodification and Commercialization in Human Embryo Research*, 6 STAN. L. & POL'Y REV. 39, 44 (1995) ("Profit will remain an acceptable motive for scientific investigators . . . .").

47. *See* Annas, *supra* note 34, at 268 (discussing how a public panel composed of non-researchers and non-physicians is necessary to regulate human experimentation in the areas of genetic engineering and human experimentation "so it can reflect public values").

48. *See generally* RUTH HUBBARD & ELIJAH WALD, EXPLODING THE GENE MYTH: HOW GENETIC INFORMATION IS PRODUCED AND MANIPULATED BY SCIENTISTS, PHYSICIANS, EMPLOYERS, INSURANCE COMPANIES, EDUCATORS, AND LAW ENFORCERS (1997); MARC LAPPE & BRITT BAILEY, AGAINST THE GRAIN (1998).

not be set aside, and human cloning should therefore be permanently banned.