

POPULAR CLONING VERSUS SCIENTIFIC CLONING IN ETHICAL DEBATES

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From the moment the Roslin Institute announced Dolly's birth¹, the potential for human cloning elicited worldwide attention, condemnation, and fear.² In the remarks that follow, I argue that much of the fear and condemnation derives from the very different connotations that society and scientists attribute to the word "clone." Popular conceptions of cloning consist of pure science fiction and probably always will. True biological cloning of human beings, however, would only produce unpredictable daughters and sons—exactly what some people desire.

I

CLONES OF HUMANS; NOT HUMAN CLONES

In the spring of 1998, I delivered a lecture to a local group of well-educated, but non-scientist, residents of Princeton, New Jersey.³ I began by telling them about the bewildering number of high-tech protocols fertility doctors already use in attempts to help infertile people have children, including in vitro fertilization,⁴ intra-cytoplasmic

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1. Dolly—the lamb born on July 5, 1996 after having been successfully cloned from a single donor cell obtained from the breast tissue of an adult sheep—was “the first mammal to be cloned from an adult cell.” LEE M. SILVER, *REMAKING EDEN: CLONING AND BEYOND IN A BRAVE NEW WORLD* 100 (1997). The Roslin Institute, responsible for Dolly's creation, announced her birth in February 1997. I. Wilmut et al., *Viable Offspring Derived from Fetal and Adult Mammalian Cells*, 385 *NATURE* 810 (1997).

2. SILVER, *supra* note 1, at 91-92; NAT'L BIOETHICS ADVISORY COMM'N, EXECUTIVE SUMMARY OF CLONING HUMAN BEINGS: REPORT AND RECOMMENDATIONS OF THE NATIONAL BIOETHICS ADVISORY COMMISSION (1997), *reprinted in* 14 *ISSUES L. & MED.* 217, 218 (1998) (noting overwhelming public concern engendered by Dolly).

3. Lee M. Silver, Remarks to Residents of Princeton, New Jersey (1998).

4. In vitro fertilization involves the removal of an unfertilized egg from a female patient, its fertilization under laboratory conditions with sperm extracted from a male, and placement of the fertilized egg in a uterus for purposes of gestation. *See generally* JENNIFER GUNNING & VERONICA ENGLISH, *HUMAN IN VITRO FERTILIZATION: A*

sperm injection (ICSI),⁵ donor egg fertilization,⁶ egg-to-egg cytoplasmic transfer,⁷ round spermatid nucleus injection (ROSNI),⁸ and egg-to-egg nuclear injection.⁹

I further told them that a number of new reproductive protocols, including cloning, were under development. But before I discussed cloning in detail, I wanted to get the group's opinion on another fertility protocol. I told them of a protocol being considered for cases of severe male infertility when only the precursors to sperm, which still contain a full complement of a man's genetic material, were present in the testes. The proposed treatment entailed the injection of one of the man's testicular nuclei into one of his wife's egg cells from which the nucleus had been removed.

If all went according to plan, the egg cell would begin to divide, producing an embryo to be placed in his wife's womb, and, nine months later, a healthy baby boy would be born. As the child grew up, he would probably look rather similar to old pictures of his father at a similar age. He might even have certain personality attributes characteristic of his father. But, since children born all over the world occasionally happen to look or behave just like one parent, this would not be considered unusual. Furthermore, the chances would be good that when this child grew into an adult, he would pursue a different career from the one his father had chosen. In any case, unless explicitly told, people would have no way of knowing that this child had been conceived through an advanced reproductive technology.

After finishing my description of this hypothetical reproductive protocol, I stopped abruptly and asked them to answer a question: "Would you consider this boy to be a clone of his father?" Two-thirds raised their hands to answer in the negative.

CASE STUDY IN THE REGULATION OF MEDICAL INNOVATION 2 (1993); SILVER, *supra* note 2, at 67-68.

5. ICSI entails the in vitro microinjection of a sperm cell into the cytoplasm of an egg. SILVER, *supra* note 1, at 72; Marsha Garrison, *The Technological Family: What's New and What's Not*, 33 FAM. L. Q. 691, 694 n.5 (1999).

6. Donor egg fertilization entails the donation of an egg to a couple, fertilization of the egg in vitro, and implantation in a female for gestation. SILVER, *supra* note 1, at 155-56.

7. As its name suggests, this process involves the transfer of the mitochondrial DNA of one egg to another fertilized egg. See John J. Sampson & Harry L. Tindall, *The Uniform Parentage Act: A Complete Revision Proposed*, DEL. LAW., Summer 1999, at 6, 10 n.11.

8. SILVER, *supra* note 1, at 73-74 (describing ROSNI as procedure whereby doctors recover "spermatids from the testes of infertile men and then pluck[] the nuclei—containing the genetic material—out of these cells. A single naked nucleus is then injected into the egg cytoplasm to initiate fertilization.").

9. See Sampson & Tindall, *supra* note 7, at 10 n.11.

In January of 1998, during a tour through the United Kingdom to publicize my book *Remaking Eden: Cloning and Beyond in a Brave New World*,¹⁰ I participated in a call-in radio talk show in Edinburgh, Scotland. In an attempt to explain what I thought the words “cloning” and “clone” meant, I said that there are already millions of human clones “walking the face of the earth,” but that we do not commonly refer to them as such. Instead, we call them identical twins. Within minutes, the radio station received a telephone call from an extremely irate woman who let it be known that even though she was an identical twin, she was certainly not a clone.

Now, nearly two years after the announcement of Dolly’s birth, I understand that the irate Scottish woman and the majority of those in the Princeton audience were correct. Clones are not simply identical twins. Some people view them as objects or individuals that constitute either exact or somewhat diminished replicas of an original object or individual, as portrayed in the movie *Multiplicity*.¹¹ Others imagine clones as androids or humanoids with a diminished soul or without any soul at all as shown in *The Stepford Wives*.¹² Others still associate the term clone with hordes of identical genetically engineered humans bred to have superior intelligence or strength. Often present is the image, straight out of Aldous Huxley’s *Brave New World*,¹³ of clones developed in laboratory incubators. In news reports on cloning, especially in the months following the original Roslin Institute announcement, American television stations routinely showed video clips depicting the various fictional views from popular films like *Multiplicity*,¹⁴ *The Boys from Brazil*,¹⁵ *Blade Runner*,¹⁶ and *Frankenstein*.¹⁷ Even educated people believe that these alarming feats have already been accomplished with animals and will soon be accomplished with human beings.

Every biologist knows, however, that even animals have not yet been cloned in the above-described ways. Scientists have used the technique of somatic cell nuclear transfer (SCNT)¹⁸ to obtain animals

10. SILVER, *supra* note 1.

11. MULTIPPLICITY (Columbia Pictures 1996).

12. THE STEPFORD WIVES (Columbia Pictures 1975).

13. ALDOUS HUXLEY, BRAVE NEW WORLD (Perennial Classics 1998) (1932).

14. MULTIPPLICITY, *supra* note 11.

15. THE BOYS FROM BRAZIL (20th Century Fox 1978).

16. BLADE RUNNER (Warner Bros. 1982).

17. FRANKENSTEIN (Universal Pictures 1931).

18. SCNT is a process in which the nucleus of an unfertilized egg is removed and replaced with the nucleus of a somatic cell. Thus, the egg will have the same genes as the person from whom the somatic cell was obtained. Leon R. Kass, *Why We Should Ban the Cloning of Human Beings*, 4 TEX. REV. L. & POL. 41, 41-42 (1999); Peggy

that share the same set of genes as ones born previously, and the same protocol could, in theory, be used with humans as well.¹⁹ But simply sharing the same set of genes does not render human beings clones, as the word is popularly used and understood. These popular versions of human cloning are, and always will be, pure fiction.

At this point, if you are a scientist, you may take issue with the notion that the public should be allowed to redefine scientific terms. Making sense of public opinion, however, requires an appreciation of the public's understanding, or misunderstanding, of the words scientists use. English is a highly fluid language, and English words are defined by their usage rather than their original intended meaning.²⁰

The use of the word "organic" constitutes the best example of this principle in action. Every chemistry student learns that an organic molecule is defined as one having a complex carbon-based structure.²¹ The student also learns that all living things on earth, without exception, are composed of organic molecules. Yet, in 1997, the U.S. Department of Agriculture responded to overwhelming public opinion by seeking comment on a proposed definition of the word organic, when used to refer to animals and plants, as food "grown and manufactured without the use of added hormones, pesticides or synthetic fertilizers."²² The vast majority of organic food enthusiasts go even further, contending that genetically modified plants should not be considered organic.²³

The word clone, like the word organic, has taken on a public identity very different from its scientific definition. While the popular definition of "organic food," however, is yielding to consensus, the popular conceptualization of what it means to be a clone remains in a state of flux. To be fair, it should be mentioned that even scientists use the term clone in two very different ways: in the first, to describe

Scheckel, *The Prospect of Cloning Human Beings: Has Knowledge Leapt Ahead of Wisdom?*, 2 DEPAUL J. HEALTH CARE L. 605, 609 (1999).

19. SILVER, *supra* note 1, at 103 (giving opinion that "[t]here is no reason to expect that adult *human* cells won't make good nuclear donors").

20. See David H. Hirsch, *Speech Acts or Fluid Language*, J. LITERARY SEMANTICS, April 1976, at 15, 28-29.

21. See ROBERT THORNTON MORRISON & ROBERT NEILSON BOYD, ORGANIC CHEMISTRY 1 (6th ed. 1992).

22. Marian Burros, *USDA to Unveil Proposed Regulations for Organic Food*, STAR TRIB., Dec. 15, 1997, at A6; National Organic Program, 62 Fed. Reg. 65,850, 65,850-01, 65,899 (Dec. 16, 1997) (to be codified at 7 C.F.R. pt. 205).

23. See *At Last, Guidelines for Organics*, ORANGE COUNTY REGISTER, Jan. 21, 2000, at C4. See also Scott Kilman, *Campbell Soup Is a Target of Protests Over Biotechnology*, WALL ST. J., July 20, 2000, at B18.

a single animal conceived through SCNT; and in the second, to describe a whole population of organisms sharing the same genome.

Personally, I find most amazing the fact that so many scientists and other scientifically literate commentators have been fooled into thinking that public opinion polls accurately gauge what ordinary people think about the scientific (rather than the fictional) version of cloning. Asking people about cloning is more akin to asking them what they think about non-organic food.

These days, when I am asked by the news media for my opinion on human cloning, I first make sure to ascertain what the reporter or journalist has in mind. Unfortunately, their questions too frequently elicit a quite simple response: There is no need to worry about the sort of human cloning they have described because cloning can never happen in that way.

II

MOST CLONING FEARS ARE UNFOUNDED

The prospect of human cloning frightens many people. More often than not, however, their fears derive from aspects of the popular conceptualization of cloning that have no basis in reality. Unfortunately, Dr. Ian Wilmut, who brought Dolly into existence, does not help matters when he makes statements such as the following: "I would not support any proposal for copying people. Each child should be wanted as an individual and if you deliberately make a copy I cannot see how that can be the case."²⁴

Dr. Wilmut, like all biologists, knows that it is impossible to "copy a person" (as opposed to copying DNA), and yet he invokes this fictitious and inflammatory image to describe the outcome of human reproductive cloning. It is precisely the image that people will be copied, as portrayed in the farcical movie, *Multiplicity*, that engenders much of the public misunderstanding of the actual scientific process and outcome of biological cloning. If one wishes to educate, rather than obfuscate, it is critical to choose one's words carefully. Scientists who describe cloning inaccurately do society a disservice. I suspect that some do so out of self-interest. Perhaps scientists who hope to use cloning technology for non-reproductive purposes, including animal and human tissue work, feel the need to take what they view as

24. Roger Highfield, *What Next: Vicky the Clone? The Formation of a Company to Produce Human Cells Is Another Step Towards the Copying of Embryos*, DAILY TELEGRAPH, May 12, 1999, at 19.

the “moral high ground” in order to protect their own research from public censure.

Cloning has elicited other fears as well. Some people worry that ill-intentioned governments or organizations will clone large numbers of warriors, factory workers, or geniuses beholden to their maker; that cloning will exacerbate the world’s population explosion; that cloning will “interfere with evolution;” that clones will be produced for body parts; or that egomaniacs will clone themselves to achieve immortality.

Even some people sufficiently educated to understand the biological process of SCNT hold exaggerated beliefs with respect to the level of similarity between a child conceived through such a process and his or her progenitor. Ethicist Leon Kass expressed commonly held views when he wrote that “[c]loning creates serious issues of identity and individuality The cloned individual, moreover, will be saddled with a genotype that has already lived. He will not be fully a surprise to the world.”²⁵

These fears, however, are groundless because the real biological process of cloning will accomplish so much less than people imagine. Children conceived by SCNT will be indistinguishable—absent DNA testing comparing the child to the progenitor—from children conceived naturally. Like all other children, they will be born as infants emerging from a woman’s womb after nine months of gestation. Like all other children, including identical twins, each one will be a unique human being with a unique identity and an unpredictable future. Furthermore, it would be no less an act of murder to remove the heart of such a child for transplantation than it would be to remove any other child’s heart, which is precisely the reason why no legitimate medical clinic would consider doing such a thing.

While genes play an important role in guiding the development of our bodies, they do not predetermine the person we will become. It will be no more possible to predict how a cloned child will turn out than to predict how any other child will turn out. It is for this very basic reason, if none other, that real biological cloning will be of no use to governments or egomaniacs. If governments wanted people with certain abilities or skills, it would be quicker and more efficient for them to institute an appropriate system of universal education and identify those citizens who demonstrate the desired characteristics. Egomaniacs, by definition, care only about themselves and no one

25. LEON R. KASS & JAMES Q. WILSON, *THE ETHICS OF HUMAN CLONING* 33 (1998).

else; they will quickly lose interest in cloning when they understand that not only will it not allow them to achieve immortality, but also that they could end up with a child who will not follow obediently in their footsteps.

III

ONE PURPOSE OF HUMAN REPRODUCTIVE CLONING

If reproductive cloning accomplishes so little, then why would anyone want to do it? The answer lies within the one thing that cloning can accomplish—it can provide a person with a biologically related child. Anyone who expects anything more from reproductive cloning than an unpredictable son or daughter to love will be sorely disappointed.

The desire to have and raise a biological child is such a powerful, seemingly irrational force that many people who experience it have a difficult time explaining its origin. The reason we cannot figure it out is because most people have so little control over it. It is programmed into our genes, and is second in power—for most people—only to the drive for self-preservation. Even the scholar Bill McKibben, who believes it is virtuous for people to not reproduce in an overcrowded world, still decided to have one child because “like most, though certainly not all, people we felt some need deeper than deep to raise and nurture a child.”²⁶ In reviewing McKibben’s book, journalist Margaret Talbot wrote, “More than work, more than nature, more even than God, children are what confer meaning on the lives of most people around the world.”²⁷ In recognition of the importance that biological reproduction plays in people’s lives, most democratic societies accept “procreative liberty” as a fundamental human right.

It is important to point out the obvious here: The vast majority of people will have no interest in reproducing through SCNT for the simple reason that most people want to, and can, satisfy their desire to reproduce with a member of the opposite sex. But even with the array of assisted reproductive technologies available today, there still exist hundreds of thousands of individuals with severe infertility problems who cannot produce either healthy sperm or healthy eggs. SCNT could provide these people with their only chance at having biological children.

26. BILL MCKIBBEN, *MAYBE ONE: A PERSONAL AND ENVIRONMENTAL ARGUMENT FOR SINGLE-CHILD FAMILIES* 127 (1998).

27. Margaret Talbot, *The Perfectionist*, *NEW REPUBLIC*, July 20 & 27, 1998, at 32, 34.

If and when cloning becomes just another routine option available at infertility clinics, the evidence suggests that its use will go beyond assisting only infertile heterosexual couples; it will also enhance the lives of lesbian couples and single women who wish to share in the joys of motherhood without a partner.²⁸ Every year thousands of lesbian couples and thousands of single women choose to have babies without the active involvement of men. But today, of course, women cannot avoid the input of male-derived sperm at the beginning of the process. In many cases, they do not know the identity of the sperm donor and have no particular reason to care about him. Furthermore, the possibility exists that his sperm could transmit undesirable disease characteristics to the child. In the future, cloning could provide such women another option. Why add to the equation the variables of unknown genes from unknown sperm donors when these can be made unnecessary, and there is no benefit to be gained by their addition? Some time in the future, thousands of women will probably ask this question. It seems reasonable to predict that many will choose cloning. In the end, neither their friends nor their families need ever know.

IV

ETHICAL CONSIDERATIONS

Before discussing the ethics of SCNT as a means of conception, it is important to separate general issues that apply to all methods of assisted reproduction from those, if any, unique to this process. It would not be ethical to use any reproductive protocol unless data indicated that the procedure did not increase the risk of birth defects in live-born children. It would also be unethical to perform any assisted reproductive procedure on a woman without first providing her with accurate and intelligible information regarding its efficiency and other potential risks. But these issues of safety, efficiency, and informed consent are not unique to cloning.

At the moment of this writing, a protocol of SCNT that is safe for human use has not been described. Thus, based on the currently available information, the use of this protocol to achieve a human pregnancy would be premature. Nevertheless, based on the enormous advances in cloning technology that have occurred so rapidly in recent years, it seems likely that the technical limitations will be overcome,

28. The evidence I cite here is from personal experience. I have received a dozen seemingly sincere letters from both single women and lesbian couples who want to use cloning technology to have babies (and who do not understand that I am not myself involved in the research).

and that a protocol safe for human use will eventually be demonstrated. If and when this happens, general principles of ethics, as they relate to assisted reproductive technologies, will no longer stand in the way of those who want to use this technology to have children to love.

Should the use of SCNT to achieve pregnancy and birth be treated any differently than other medical protocols and, in particular, other assisted reproduction protocols? When it comes to discussing the "ethics of cloning," this is the critical question. If this question is answered in the negative, then there are no unique questions of ethics involved in cloning. For the reasons discussed in this article, I share this view.

Others disagree. Some argue that cloning is wrong because it is unnatural, and we should not go against nature.²⁹ But every time we cure a disease with medicine, or prevent death with the use of medicine, we go against nature. Disease and death are as natural as birth and living.

The bioethicist George Annas goes further in claiming that "[c]loning is replication, not reproduction, and represents a difference in kind, not in degree, in the way humans continue the species."³⁰ Professor Annas is wrong. Except in the popular view, cloning is not replication, rather it is reproduction of an asexual type. More important than semantics, though, is the disproven notion that reproduction is a way of continuing the species. It is not. Reproduction is a way of continuing one's own personal bloodline. And if the child that emerges is healthy and happy, the philosophical debate as to whether cloning is a difference in kind or degree is irrelevant.

Some, like the lawyer and scholar Lori Andrews, claim that "[a] cloned child will be a child who is likely to be exposed to limited experiences and limited opportunities."³¹ This unsubstantiated claim is based on a faulty assessment of the reasons that will drive people to use the technology. Why would normal loving parents want to restrict the life of their child in negative ways? Similarly, Leon Kass claims that cloning is wrong because it will confound "all normal understand-

29. See, e.g., CATHOLIC MED. ASS'N, HUMAN CLONING: POSITION PAPER OF THE CATHOLIC MEDICAL ASSOCIATION, reprinted in 15 ISSUES L. & MED. 323, 323-24 (2000) ("The cloning of human beings would be a violation of the natural moral law. Research in cloning as it applies to man is degrading. It destroys the dignity of human nature by treating the human person as a material commodity to be manipulated according to whim and fancy.").

30. George J. Annas, *Human Cloning: Should the United States Legislate Against It?*, A.B.A. J., May 1997, at 80, 80.

31. Lori B. Andrews, *Mom, Dad, Clone: Implications for Reproductive Privacy*, 7 CAMBRIDGE Q. HEALTHCARE ETHICS 176, 183 (1998).

ings of father, mother, sibling, and grandparent and all moral relations tied thereto.”³² Not only is this claim unsubstantiated, it is belied by the millions of normal healthy families that exist today in which traditional genetic connections between children and parents are absent.

When all else fails, opponents of cloning retreat back to the gut feeling expressed by Professor Kass who wrote, “We are repelled by the prospect of cloning human beings . . . because we intuit and feel, immediately and without argument, the violation of things that we rightfully hold dear.”³³ It is important to understand that this is not an ethical argument, but a religious one. The Catholic Church used the same argument in its persecution of Galileo in the seventeenth century, as do current religious leaders in railing against teaching evolution in schools.

V

SHOULD SOCIETY ALLOW HUMAN REPRODUCTIVE CLONING?

When Dr. Wilmut was asked for his opinion on the reproductive cloning of humans, he responded that he “can’t see the reason for copying people anyway.”³⁴ With this statement, he implies that we as a society should ban reproductive cloning if we cannot find a good reason to allow it.

Dr. Wilmut comes from a culture in which the state provides basic medical services, including infertility treatments, to its citizens. The state is always working with limited resources and, as a result of economic constraints—if nothing else—it will need to choose which services to provide and at what level. The state will clearly have no reason to provide its citizens with a procedure or service that, in the eyes of the state, has no obvious utility.

This rationale for disallowing services—because they lack obvious utility—simply does not apply when they can be bought or sold in the marketplace of a free democratic society. I find no utility in breast implants when small-breasted women use them simply to increase their perceived sex appeal. My opinion as to the utility of this procedure, however, does not mean that the state should stop private clinics from offering safe breast augmentation services.

32. KASS & WILSON, *supra* note 25, at 26.

33. *Id.* at 19.

34. Anjana Ahuja, *What Dolly’s Creator Did Next*, TIMES LONDON, Jan. 10, 2000, at 35.

If a for-profit clinic offers reproductive cloning as a service, it does not matter whether Dr. Wilmut, or anyone else, sees its utility. As long as the clinic follows the general ethical principles enunciated above, the only thing that matters is whether enough individuals and couples find the service useful and are willing to pay enough money to keep the clinic in business.

VI CONCLUSION

Should we allow human cloning when it becomes safe and efficient? In a free society, this is not a question that we have the right to consider.

Many paths to parenthood exist today that were not available in past generations. Indeed, we are probably not far from the day when people of any sex will be able to have children by themselves or with any other person of any sex. It is wrong to judge the validity of any safe approach to baby-making by where or how development begins. Instead, the validity should be judged by the love a parent gives to the child after he or she is born.

