

1-2002

## Cloning and Government Regulation

Hank Greely

Follow this and additional works at: [https://repository.uchastings.edu/hastings\\_law\\_journal](https://repository.uchastings.edu/hastings_law_journal)



Part of the [Law Commons](#)

---

### Recommended Citation

Hank Greely, *Cloning and Government Regulation*, 53 HASTINGS L.J. 1085 (2002).

Available at: [https://repository.uchastings.edu/hastings\\_law\\_journal/vol53/iss5/8](https://repository.uchastings.edu/hastings_law_journal/vol53/iss5/8)

This Symposium is brought to you for free and open access by the Law Journals at UC Hastings Scholarship Repository. It has been accepted for inclusion in Hastings Law Journal by an authorized editor of UC Hastings Scholarship Repository. For more information, please contact [wangangela@uchastings.edu](mailto:wangangela@uchastings.edu).

# Cloning and Government Regulation

*transcribed remarks of*  
PROFESSOR HANK GREELY\*

It is a pleasure to be here. It has been exactly four years and eleven months since the day I first heard about Dolly. In those months I spent a lot of time thinking about issues in human cloning. As a member of the California Advisory Committee on Human Cloning (and as the primary editor of its eventual report) I spent a great deal of time trying to make sure that its recommendations were unanimous—and that all of the commas were in place—among the twelve committee members.

The title of this panel discussion is “Cloning and Government Regulation.” I am not sure that I will stay precisely within that title, but I plan to discuss two topics that, given what you have already heard today, I think will be most useful for you in trying to understand some of these debates: human reproductive cloning and human non-reproductive cloning.

## I. Human Reproductive Cloning

### A. A History of Crises

Let’s start with some of the relevant history on human reproductive cloning. By my count, we are currently in our fourth cloning crisis. The first cloning crisis ran from about 1966 to 1974, kicked off by Dr. John Gurdon’s dramatic scientific work with frogs, including a wonderful photo involving cloned albino frogs that was on the cover of *Science*. Public knowledge of Dr. Gurdon’s work was increased by the writings of Dr. Joshua Lederberg, a Stanford geneticist who wrote several articles about interesting things one could do with clones. This cloning crisis moved into high gear around 1970 and 1971 not only with Toeffler’s book, but with *New York Times Magazine* articles by Willard Gaylin and Dr. James Watson—who has never been shy about saying controversial things. It eventually died out around 1974. The movement petered out, not

---

\* Professor of Law, Stanford University.

because all the questions raised by the possibility of human cloning had been answered, but perhaps because of the increasing controversy over recombinant DNA and its "cloning" of DNA. Recombinant DNA was a much more concrete and immediate issue, human cloning remained speculative, and suddenly we heard nothing more about human cloning.

The second crisis hit in 1978. A then-respected science journalist named David Rorvick wrote and Lippincott (a presumably reputable publisher) published a book called *IN HIS OWN IMAGE* which, billed as nonfiction, told the story of the first human clone. The story has a rich millionaire convincing a mad scientist to clone him, and then going to a tropical Asian island where he finds a beautiful young woman to carry the fetus. The book ends with the birth of a son named, of course, Adam. Controversy ensued and congressional hearings were held, at which David Rorvick chose not to appear. The controversy continued until the birth of Louise Brown, the world's first test tube baby. Then, once again a cloning crisis was cut short by a more immediate controversy: *in vitro* fertilization leading to the birth of a child. Additionally, it became generally accepted that Rorvick's book was a hoax, in part because Rorvick made one very interestingly stupid scientific mistake. Almost all the cells in our body have a near-complete set of DNA. Rorvick has his scientist use erythrocytes, or red blood cells, as the donor cell for his nuclear transfer technology. Erythrocytes are among the only cells in the body that do not have any DNA in them. For that and other reasons, Rorvick was discredited, ushering in the end of the second cloning crisis.

The third cloning crisis came up in 1993. Two *in vitro* fertilization researchers in Washington D.C. presented an abstract related to embryo splitting at an annual meeting on advanced reproductive technologies. Embryo splitting is a form of cloning akin to natural twinning, where an early embryo is split in two. The researchers used embryos that had been fertilized more than once and thus would not be viable. *Time* magazine put them on the cover with a human cloning story. This crisis did not last long. It only took people a few months to realize that this was not the kind of human cloning that they feared. This was not the popular image of BRAVE NEW WORLD, but something much less frightening. It was then discovered that the researchers had failed to get approval for this research from their human subjects committee. As a result, the study was never published, and reputations were ruined.

Cloning crisis four started with Dolly, not with her birth, but with the *announcement* of her birth. As pointed out earlier, Dolly had been alive for seven months before her existence was leaked out. With the research about to be published in *Nature*, some of the

British tabloids jumped the gun and leaked the news of her birth.

The Dolly cloning crisis can itself be subdivided. First came the immediate crisis. Within a couple of months of the announcement, what was then the Group of Seven plus Russia, meeting in Colorado, closed their meeting with a communiqué dealing with many important world matters: war, peace, poverty, development and . . . human cloning. All eight countries agreed that human cloning would be bad and should never happen. But not very much followed from that, at least in the United States, other than the 1997 California law putting a five year moratorium on cloning.

Interest in human cloning rose again in early 1998, when the oddly-named Dr. Richard Seed (who looked like a mad scientist from central casting) announced he was going to clone himself. Trent Lott, then the majority leader of the U.S. Senate, tried to rush through an anti-cloning bill without committee hearings. The FDA, which had not said anything up to this point, suddenly asserted that it had jurisdiction over human cloning. It announced its jurisdiction—a position that is questionable as a matter of statutory law—at a very politically convenient time, and the Senate bills were not taken up. Cloning receded again.

Last summer we had congressional hearings on human cloning. Drs. Antinori and Zavos proclaimed their intention to clone people in some unnamed Mediterranean country. Rael himself, the prophet of the Raelians, testified. The Raelians are a religious group headquartered in the UFO-Land theme park in Quebec. They claim that humans are the clones of aliens, who now want the Raelians to pursue the technology themselves. The Raelians regularly trot out Dr. Brigitte Boisselier, their biochemist in charge of the cloning project along with a flock of beautiful young women who say that “we will be clone mothers any time Rael wants.” The press really couldn’t ask for a better story than the Raelians. The result of the hearings was yet another surge in public interest in human cloning, ultimately leading the House of Representatives to vote to ban both reproductive and non-reproductive cloning.

Arguably, another phase of the Dolly cloning crisis occurred with the recent announcement by Advanced Cell Technologies that they had cloned human embryos. In fact, their research seems to have been a dismal failure at producing cloned human embryos, but it was loudly trumpeted. It once again prompted concern. And now, having passed the House, bills for banning human cloning await action in the Senate.

Despite those four different crises, as far as we know there has *never* been a human clone produced through the nuclear transfer process. Thus far, the cloning crises rank right up there with Y2K, the missile gap, and a variety of other over-hyped menaces. An awful lot

of people have paid an awful lot of attention to something that has never happened. And that, frankly, as far as we know, may never happen. It is quite impressive that after almost five years of effort and thousands of attempts, a grand total of *one* non-human primate has been cloned. Researchers at Oregon State University cloned one monkey early-on (albeit from an embryonic donor cell); no other primate has succeeded it. My own guess is that human cloning probably can ultimately be done, but that uncertainty remains. Our ignorance, however, has not prevented enormous controversy.

### **B. The Compelling Safety Argument Against Human Reproductive Cloning**

The California Advisory Committee unanimously recommended that California should ban human reproductive cloning. We all agreed that the safety issues alone were sufficient to justify a ban. Most of us felt that there were also some powerful non-safety issues, although I am not sure the Committee would have had a majority for any particular non-safety issue. In my own view—speaking personally and not as a member of the Committee—the safety argument against reproductive cloning is the only compelling argument. As to what I mean by “compelling,” let me reinforce the distinction that Cass Sunstein made in his talk: I am not talking about the constitutional justification and whether it passes a rational relationship test. A rational relationship is anything five Supreme Court Justices can say with a straight face. Instead, I am interested in whether a dispassionate observer—assuming you could find such a beast—would feel it necessary to support regulation and legislation on the basis of that argument. For me, the safety argument compels a ban. The non-safety arguments might lead me to support a ban, but none of them *compels* me to support one. I am particularly worried about the *in vitro* fertilization industry playing on people’s desperation and fears in its full, unregulated glory. If cloning were allowed, a variety of ancillary regulations would be necessary. But, at this point, I probably would not vote to ban reproductive cloning if it were shown to be safe.

Because of the safety issue, and in spite of his comments this morning, I think I might have been able to get Lee Silver to sign our recommendation because it is very hard to argue that this is a safe technology today. Alex Capron’s statistics on the lack of safety in cloning were quite powerful.

There are a variety of theoretical reasons as to why the technology is unsafe today—here are four. First, there is the imprinting argument that Dr. Jaenisch made. Second, there is the question about whether or not the de-differentiation of the donor nucleus is complete. Third, there is the question of telomeres and

their shortening. A fourth reason is, in my opinion, particularly powerful. We could clone a new version of me, in theory, with a cell from the inside of my cheek (a buccal cell). I have 35,000 or so genes. To be a properly functioning cheek cell, about 12,000 of them must be in working order. To make a human, presumably, you need all 35,000 of them in working order. Every time a cell divides, on average, about one base pair changes. My cheek cells have divided hundreds of times in the forty-nine years that I have been around. The mutations caused by those cell divisions would not be visible unless they affected the genes important to cheek cells. So, I might have the genetic variation that causes Huntington's disease in some cheek cells, because of these somatic cell mutations, but, because Huntington's disease strikes neurons and not cheek cells, it would not bother me. It would, however, bother my clone; or as would a mutation in that cheek cell that would prevent the formation of a nervous system. That, to me, is in some ways the most difficult long-term safety issue for reproductive cloning (although, as Lee Silver has pointed out to me, it exists in natural reproduction to some extent because of the many cellular divisions of sperm).

In addition to these theoretical issues, safety concerns have been empirically demonstrated. Looking at the results from cattle, sheep, pigs, mice, and one gaur which died shortly after birth, it is clear that this is not a safe technology. Of course, the issue does not end with saying it is not "safe." Lee Silver showed, in order to abuse it, a slide with a quotation saying, "We've got to be 100% certain." Of course we don't have to be 100% certain. We can't be 100% certain of anything—arguably not even death and taxes—and certainly not safety, particularly when the traditional way of making babies has well known and non-trivial risks. I believe a ten to twenty year research program on non-human primates might provide enough confidence in the safety of the procedure for it to be tried on women. I do not invoke safety issues to block cloning forever. One could actually require steps similar to those taken by the Food and Drug Administration for all drugs and biological devices to see whether this procedure is safe enough to go to clinical trials in humans. (Of course, I referred to the application of the procedure to women because women would necessarily have to carry the cloned embryos, leaving aside some of Lee's plausible but longer term speculation about male pregnancy—which, I think I can speak for almost all of my sex in describing as a very unattractive thought.)

Another tricky part of the safety argument is that many reproductive safety concerns are not regulated. The FDA regulates drugs and devices, but not medical procedures, and so we do not regulate the safety of most assisted reproductive procedures. I think we should. It is outrageous that *in vitro* fertilization was used on

humans before it was tried with non-human primates. While it may be convenient to have your experimental subjects be people who will pay you thousands of dollars to experiment on them, that does not make it right. So, with respect to other assisted reproductive technologies whose safety is not regulated, I think we should regulate them as well. If, politically, we must start with reproductive cloning, we should start there.

The tougher safety question is not assisted reproductive technologies, but normal reproduction. This may not be a big issue for the average birth. Although about fifty to eighty percent of fertilized eggs do not become fetuses, only a small percentage of fetuses miscarry, and only one to two percent of live births have serious birth defects. But if you choose particular parents, you can get very high safety risks. For example, a couple who both carry one allele for Tay-Sachs disease will face a 25% risk that their child will be born with the disease. Children born near the end of a woman's reproductive span face substantially increased risks for birth defects. If you pick the parents carefully, you could put their children at risks higher than the current risks for human cloning, but we do not ban sexual reproduction by high risk parents. I think one needs to distinguish between reproduction by sex and reproduction by other technologies for a combination of reasons, including intimacy, privacy, tradition, and the difficulty of enforcement. Regulating high tech reproduction is a lot easier than regulating (successfully) who is going to have sex with whom. The latter, in line with Radhika Rao's comments this morning, does trample more on either constitutional interests or, at least, interests we hold dear, whether or not they are of constitutional stature.

### C. The Case For Reproductive Cloning

Looking at the other side of the arguments about human reproductive cloning, strong arguments can be made for some uses for cloning. The best argument concerns couples who are infertile because one of them has gametic insufficiency. She does not make eggs or he does not make sperm. They have a quite plausible argument, but not a convincing one when weighed against the safety to the child. This is particularly true in light of the alternatives of adoption, egg donation, or sperm donation. For example, if a husband is spermless but the wife has ova and the husband has a brother, they could use the brother's sperm to produce a child that is 50% genetically the same as the wife and 25% genetically the same as the husband. In some respects, the resulting child would be closer to being *their* child than a clone would be.

At the further end of this issue, Lee Silver presented another provocative observation. In mice, females can be induced to produce

sperm and males can be induced to make eggs. If that were to work in humans, after appropriate safety testing, then the infertility problem goes away. The problem even goes away, to some extent, for the forty-nine year-old woman who wants to have a baby but does not have a father in mind. She could use her own egg and then have her own sperm made. The resulting child would be more genetically like her than a child made from sex with different people would be, but would not be her clone. She would actually be undertaking a kind of sexual reproduction with herself—a functional though not physical hermaphroditism—and the child would be genetically different from her. This remains rank speculation and, for now, some plausible arguments remain to justify the use of cloning for infertility. I am sure Mark Eibert will make them at more length than I did. Still, the safety argument for me is compelling.

#### **D. A Repugnant Non-Safety Argument**

I want to at least mention one of the non-safety arguments, but not at length because Cass Sunstein did a nice job attacking this argument at lunch. I am not a friend or a colleague of Leon Kass and I do not share a name with him, even one spelled differently. I thought his “Wisdom of Repugnance”<sup>1</sup> article made one of the worst arguments I have ever seen. That argument is that repugnance is not just a warning flag, but that it has some independent moral force. I agree a reaction of repugnance to a proposal should serve as a warning flag. I disagree, however, that without logical arguments against the proposal, a reaction of repugnance has moral force in and of itself. The article further suggests that if people are split on an issue, those who do not feel repugnance may be abnormal and not real, right-thinking people. For example, Lee Silver, I assume, does not have a feeling of repugnance about cloning. According to Kass, he should not count.

I am sure a vast majority of the population of the City and County of San Francisco—and probably a majority of people in this room—have within the last few years done things that would have been repugnant (or illegal) in the United States or England within the last two hundred years. And I am not talking just about sex, although certainly there is a large category of practices that would have been viewed as repugnant—and not just same-sex practices—that were repugnant and illegal, and in some states still are. Women today (gasp) vote, hold jobs, and own property. Jews have civil rights; they can run for office, be elected, be seated. Catholics can actually own land, run for office, and attend college, something that was not true in

---

1. Leon R. Kass, M.D., *The Wisdom of Repugnance*, in *THE ETHICS OF HUMAN CLONING 1*, (Am. Inst. for Pub. Pol’y Res. 1998).

the United Kingdom until the 1830s. All sorts of things that *were* repugnant are now not only accepted, but celebrated. To me, the "Wisdom of Repugnance" argument itself is repugnant, as is the fact that its author is now the chair of the President's Bioethics Committee and was able to handpick its members with apparently very little intervention from the White House.

### E. Summation on Reproductive Cloning

In going through the history of human cloning, I do not think it is too strong to say that it is a history of hysterical reactions. There have been many hysterical reactions to the very idea of human reproductive cloning. That does not mean that reproductive cloning is a good thing. Just because some people react against it for the wrong reasons does not mean that it is something that we should do. I believe human reproductive cloning *should* be banned, largely on safety grounds. But at the same time, if a human clone is born, my world is not going to end. Civilization will not totter. We will not start dating our years B.C., Before Clone, and A.C., After Clone. If it happens, once the media reaction died down, it would not be that big of a deal. Nor in the long run do I expect that it will ever replace the traditional method of making babies, which has advantages of cheapness, familiarity, comfort, and, in some cases, pleasure (at least at the beginning—labor and delivery, those are different matters).

## II. Human Non-Reproductive Cloning

### A. Terminology

I want to echo what Alex Capron said about terminology. I wish "therapeutic cloning," as a term, would go away. In part, I agree with him that it is not therapeutic (yet), it is merely research towards therapy. In part, I think people can honestly say that reproductive cloning *is* therapeutic for people who are infertile or for people who want to grow a living clone for a bone marrow transplant. I do not particularly like Professor Capron's term, "research cloning," because reproductive cloning could have a research purpose. In fact, if clones were ever born, I would hope that they would be researched along the lines that Dr. Segal researches twins. It wouldn't be ethical to create clones for the purpose of such research, but if clones existed, fascinating things about genotype and environment could be learned.

I prefer "reproductive" and "non-reproductive" as terms. There are people who will say the second term is not right because making the embryo *is* reproduction. Well, when my wife and I decided to have a baby, we didn't quit when she got pregnant and say, "Ah, we've got an embryo, we've reproduced." My parents didn't think we

had provided them with the grandchildren they had wanted. If we had to, we could use the terms “born-baby-making cloning” versus “non-born-baby-making cloning” because everyone would agree that is a difference. One sort of cloning is intended to lead to babies—born babies if you accept the position that embryos are babies—and one sort of cloning is not.

### **B. Direct Arguments Against Non-Reproductive Cloning**

The California committee did a good job of looking at the arguments about human non-reproductive cloning. Most of them are arguments about human embryo research. There is nothing unique to most of the arguments against non-reproductive cloning. The main arguments against human non-reproductive cloning are arguments about the moral status of embryos, exploitation of egg donors, and issues of distributive justice, all of which come up with human embryo research that does not involve cloning.

Of these, the moral status of the embryo issue is, of course, the hardest. I do not know how to convince anybody one way or the other on that. I know my position, which is a relatively weak one. I believe the embryo, morally, is more than just a clump of human cells. It is due some level of respect, but a relatively weak level of respect. If you tell me you think it is a full human entitled to life, if not liberty and the pursuit of happiness, or maybe all three of those—but not to vote or to drive yet—I don’t know how I can dissuade you from that. I would only note that, although this research is old and surprisingly poorly followed through, in natural reproduction, for every baby born, somewhere between two and four embryos—eggs that are fertilized—never become babies. Most of them never become fetuses and some of the fetuses then never become live births. There are about four million children born each year in the United States and about two and a half million deaths. If embryos are living humans, then we need to multiply the number of people who die each year in the United States by about five. That is another twelve million deaths every year in the United States of zygotes that never make it to children. We don’t treat it that way. Note also that people who believe that embryos are given immortal souls face an interesting situation where about eighty percent of all human souls in the afterlife were never actually born. What that would mean for heaven I certainly don’t know. I believe the concept of limbo, an afterlife destination for unbaptized infants, is itself in limbo. I don’t know what Christian doctrine would say happens to the embryonic souls that vastly outnumber those of us who were fortunate enough to have been born.

### C. The Slippery Slope

The arguments against human non-reproductive cloning do connect to reproductive cloning in one respect, and that is the argument that Alex Capron made. I would call it a slippery slope argument, although that is not entirely fair to his excellent presentation of it. Before this morning I thought it was a silly argument. After listening to Alex Capron, I don't think his version of it is silly at all. It is an argument that has to be taken seriously. However, I don't find it convincing. I therefore want to take a little time to conclude by explaining why I don't find the argument convincing.

I break down his argument into two parts: a substantive part and a political part. There is a substantive argument that we need to ban non-reproductive cloning to keep clones from being born. And there is the political argument that we need to ban it for political reasons connected to banning reproductive cloning.

But before reaching either of those arguments, note a few preliminary points. As to the substantive argument, note first that the leakage of embryos cloned for non-reproductive purposes leading to the birth of a clone is only a catastrophe if you think a clone being born would be a catastrophe. If you believe that cloning should be banned on safety grounds, the birth of any one clone, healthy or unhealthy is unfortunate, but it is not a world-changing catastrophe.

In addition, for any of the slippery slope arguments against human non-reproductive cloning to be valid, one would have to argue that *but for* non-reproductive cloning, no clones would be born. So, Capron's argument must be that non-reproductive cloning makes it more likely that someone will break the law—risk criminal penalties against reproductive cloning—and thereby lead to the birth of a clone. The argument requires then, that if we didn't have non-reproductive cloning, no one would cheat, make their own embryo, implant it and have a baby. It might be fairer to say that fewer people would create cloned babies, but if you are focusing on preventing the world from being irrevocably changed by the birth of even one cloned baby, the stronger requirement is in force.

Now, note a statistic Alex gave. Thirty countries have banned human cloning. Not all have banned non-reproductive cloning. That leaves about 160-plus countries that have not banned cloning. Many of those 160 countries have advanced medical technologies and all of them have the ability to support an outside group coming in with advanced medical technologies, such as, for example, Drs. Antinori and Zavos. Even within the United States, murder is illegal, but that doesn't stop murder. So the idea that anything we do will absolutely and completely prevent a clone from being born if it is at all possible—still an unsettled question—is a vain hope. If it can be

done, I suspect it will be done. The purpose of regulation isn't to guarantee it will never happen, but to reduce its incidence, the same as with murder.

As to Alex's substantive ways in which banning non-reproductive cloning is important to preventing human reproductive cloning I find the leakage argument a little odd. I presume that most of the research cloning would be done in labs with people interested in developmental biology, in regenerative medicine, and so on. To implant a clone, you need an *in vitro* fertilization clinic, or at least pregnant women and somebody who knows about implantation. So we have to posit a scenario where a developmental biology lab gives an embryo to its local IVF lab, or the local *in vitro* fertilization lab steals it, with both sides risking criminal penalties. It's not impossible. It might happen. I just don't think it is very likely to happen or that it would happen very often.

The stronger part of Alex Capron's substantive argument is that human non-reproductive cloning will lead to technological advances that will make human reproductive cloning possible, but even that depends on a particular state of scientific reality. If it turns out we cannot make human embryos at all—that we cannot make blastocysts by cloning—then it does not matter. We are not going to have either reproductive or non-reproductive cloning. If we can make blastocysts (and hence do non-reproductive cloning) but they cannot implant and develop successfully, then the slippery slope does not exist. And if it turns out that it is relatively easy to make cloned embryos, then *in vitro* fertilization labs can do it quite easily without any need of researchers' non-reproductive embryos. Alex's argument only works if it turns out to be possible to make human cloned embryos and then babies, but it's quite tricky, with a need for a great deal of technology to be developed in order to do it. How likely is that? Who knows?

I weigh that uncertainty on one side against the research benefits on the other. And yes, Alex is certainly right that Michael West is grossly exaggerating in saying that this will cure people immediately. It may never cure people. But this area of regenerative medicine is one of the most promising and exciting in all of biomedical research. Promises are not guarantees, but these are promising and exciting new ways to try to deal with human suffering that already exists. Cutting off the research we have now and waiting for further developments (coming from overseas, most likely) would not be a cataclysmic event, but I think it would be unfortunate. It would slow down research that may turn out to have important ramifications, some of which we cannot even predict at this point. So I don't ultimately find the substantive part of the slippery slope argument—that we have to stop non-reproductive cloning to stop reproductive cloning—very persuasive.

Alex's political arguments are harder to evaluate. Handicapping Congress makes handicapping March Madness in the NCAA basketball tournaments look easy by comparison. I don't agree with Alex, but I have a great deal of humility and uncertainty in saying that Congress would pass a straight ban on reproductive cloning. Even if he proved to be right, I would not give up immediately. I would argue for the reproductive ban. One might need to fall back on Alex's position as a compromise, but it need not be given up at the beginning, solely on the untested idea that only a dual ban could be passed. And, I would fight against giving up non-reproductive cloning.

As to the argument about America's international leadership role in banning human reproductive cloning—good luck getting 189 countries to agree on anything and then to enforce it. I don't find that argument particularly strong, although it is plausible.

### III. Conclusion

I have a general problem with the slippery slope argument (and this is not Alex's more solid argument) that if we take this step, we will not be able to control where we go. All of our lives are led on slippery slopes. Everywhere we stand is a slippery slope. The first time you break the speed limit, you are on a slippery slope that can lead to murder, just because you have broken the law. The first time a married person looks at someone else "with lust in your heart," as President Carter termed it, you are on a slippery slope. Life is made of slippery slopes.

As moral agents and as moral actors, stopping on slippery slopes is our constant practice. What we as individuals, as legislators, and as governments do is figure out where to draw the lines and how to stop ourselves on slippery slopes. And in a sense, it is hubris for us to try and rule out these slopes in advance for our descendants. The children of my generation will soon own the world—many of you are out there. The children of your generation, believe it or not, will then take the world over from you in what will seem to you like the twinkling of an eye. I don't think we should try to foreclose the decisions our children and grandchildren will make about where they place the lines, about where on the slippery slope they want to be. We must, to some extent, let go of the future and not fight so hard to control it. Some arguments against cloning that focus on its speculative, long term negative effects are fundamentally disrespectful to the intelligence and the moral ability of the children who will come after us, who should be at least our equals as moral actors—whether or not they are reproductive clones.

Thank you.