

Cloning—A Matter of Life

CHRISTOPHER DE JONGE

From the Reproductive Medicine Center, Department of Obstetrics and Gynecology, University of Minnesota, Minneapolis, Minnesota.

Therapeutic cloning, or more accurately, as suggested by Vogelstein et al (2002), nuclear transplantation, is intended to “treat a specific disease of tissue degeneration.” As its name implies, the purpose of reproductive cloning is to replicate or duplicate a human. For the purpose of this article, the terms *therapeutic cloning* and *reproductive cloning* will be used because they are readily recognized and it suits the central question of this article, which is: Can cloning, whether therapeutic or reproductive, be objectively evaluated for use? This is a difficult question to address, especially when the issue being studied has an inexorable relationship with those making the evaluation (eg, clerics, politicians, and the lay community).

Cloning, or more generally, manipulation of the human reproductive process, is mired in politics, religion, and hyperbole. One central conundrum of the ethics of cloning is the relationship between the abstraction of when human life begins; that is to say, when the human embryo becomes distinct and separate from all other life forms during embryogenesis, and thus, the moral status of the human embryo. For some religious groups, human life becomes distinct at conception, and as such, the embryo merits the same rights and respect as you or me. In the reproductive sciences and for some countries in which in vitro fertilization is government-regulated, human life becomes distinct from other mammalian life forms at Day 14, when neural tube development begins. Can a globally acceptable definition for when human life begins be identified? The answer, clearly, is no. But why not?

The ability to clone embryos has caused a dramatic increase in the scrutiny of areas in science and medicine that are already the object of criticism. To make matters exponentially worse are the proclamations by individuals

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who are bent on cloning for the purpose of reproducing humans. One scientist, Dr Brigitte Boisselier (see <http://www.clonaid.com/>), is linked to a cult of people, the Raelians (<http://www.rael.org/>), who identify with extraterrestrials. Reports state that the daughter of Dr Boisselier has volunteered to act as a gestational surrogate for such experiments. Two other scientists, Drs Severino Antinori and Panayiotis Zavos, are pursuing cloning for the purpose of human duplication under the pretext of remedying infertility. These few renegade scientists are in the minority relative to the vast majority of scientists on a global scale who oppose cloning for purposes of human propagation.

In the United States, reproductive and therapeutic cloning have become inexorably linked. This link has been reinforced through the media-covered side-circus provided by the Raelians, Drs Antinori and Zavos, and through publicized debate on the topics in the US Congress. Arguably, the inability to distinguish between reproductive and therapeutic cloning was exacerbated on Thursday, August 9, 2001, when President Bush thrust bioethics into the nation’s consciousness. In his targeted speech, President Bush stated:

I strongly oppose human cloning, as do most Americans. We recoil at the idea of growing human beings for spare body parts, or creating life for our convenience. I have concluded that we should allow federal funds to be used for research on these existing stem cell lines, where the life and death decision has already been made. Leading scientists tell me research on these 60 lines has great promise that could lead to breakthrough therapies and cures. This allows us to explore the promise and potential of stem cell research without crossing a fundamental moral line, by providing taxpayer funding that would sanction or encourage further destruction of human embryos that have at least the potential for life.

President Bush, rightly or wrongly, made several conclusions as proxy for a diverse American population. First, he provided definition for when human life begins and the moral status of the human embryo. Second, he took the paradoxical position (by splitting a moral hair) of supporting an investigation of cloning existing cell lines and opposing an investigation that would create new cell lines. And last, he made the two distinct forms of cloning equal and indistinguishable. In regards to the latter, one member of the President’s Council on Bioethics stated for the record, “I myself do not believe that there is a distinction between reproductive and therapeutic cloning.”

President Bush and many in his party heartily embrace conservative social policies. This conservatism is often

Correspondence to: Christopher De Jonge, PhD, HCLD, Reproductive Medicine Center, 606 4th Avenue South, Suite 500, Minneapolis, MN 55454 (e-mail: dejonge@umn.edu).

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supported and reinforced by the application of religious beliefs. Religious ideology contributes strongly to the question of when human life begins and to defining the moral status of the human embryo. I would speculate that our president and those who are like-minded in the religious right define the start of human life at conception, believing that the embryo at this early stage of human development merits the same moral status as you or me. If this reasoning were plausible, then the same individuals would have to conclude that any form of cloning using human embryos is morally wrong, or their arguments would be logically inconsistent.

On April 10, 2002, President Bush convened a gathering of politicians to reinforce opposition to human cloning for reproductive or medical purposes. In a *New York Times* article the same day (April 10, 2002), physician Senator Bill Frist (R-Tenn) was quoted as saying, "After considering the overwhelming ethical concerns about human embryo cloning experimentation, I conclude that a comprehensive ban on all human cloning is the right policy at this time" (Stolberg, 2002a).

In contrast, Senator Dianne Feinstein (D-Calif), part of a coalition that supports therapeutic cloning, stated, "This (therapeutic cloning) is a very promising field of research." To ban all forms of cloning, she said, is "like throwing the baby out with the bathwater." This statement by Senator Feinstein serves to reinforce how therapeutic and reproductive cloning have become indistinguishable in the minds of some. When Senator Feinstein's statement is reconstructed in the context of the opening question in this current essay, it translates as: How can an accurate determination of baby versus bathwater be made before discarding some or all of the parts? Alternatively, how can an accurate determination be made concerning the merit of therapeutic versus reproductive cloning when the two have become indistinguishable?

The President's Council on Bioethics, chaired by Leon R. Kass, a bioethicist who adamantly opposes cloning for any reason, convened a meeting February 13, 2002, to address the scientific and medical aspects of human cloning (transcript available at <http://www.bioethics.gov/transcript.html>). The Council was comprised of prestigious scientific and medical experts. Integral in the day's proceedings was a report delivered by Dr Irving Weissman, chairman of the National Academies Panel on Scientific and Medical Aspects of Human Cloning (National Research Council, 2002). Summarizing the report, Dr Weissman stated:

Human reproductive cloning should not now be practiced. It is dangerous and likely to fail. The panel, therefore, unanimously supports the proposal that there should be a legally enforceable ban on the practice of human reproductive cloning . . . the scientific and medical considerations that justify a ban on human reproductive cloning at

this time are not applicable to nuclear transplantation to produce stem cells. Because of the considerable potential for developing new medical therapies for life-threatening diseases and advancing fundamental knowledge, the panel supports the conclusion of a recent National Academies report

The conclusion in the National Academies' stem cell report (National Research Council, 2001) committee, chaired by Bert Vogelstein, PhD, ". . . recommended that biomedical research using nuclear transplantation to produce stem cells be permitted. A broad national dialogue on the societal, religious and ethical issues is encouraged on this matter." The conclusions made by both panels of the National Academy were unanimous.

The quantitative and qualitative data show that reproductive cloning is not efficient and often has dramatic negative results. Should these non-human animal outcomes surface in human application, one cannot help but picture the "production" of monsters. Gross atypical abnormalities have been witnessed in numerous fetal animal clones. One-third of animal clone offspring die shortly before or shortly after birth. Even those that appear normal when born sometimes die later of heart, lung, or immune problems. So, regardless of where one might stand on the issue of the moral status of the human embryo, one would be hard-pressed to find unanimity in favor of cloning humans. Thus, one can side easily with the conclusions drawn by the aforementioned panels and support a global ban on reproductive cloning. But in practice, such a ban will be very difficult if not impossible to enforce. The avalanche has already started and likely cannot be stopped, largely because of consumerism. Dr Zavos stated at a human cloning conference in Rome, Italy, March 2001, "The genie is out of the bottle. We need to make sure it is bottled and disseminated responsibly." One can envision the purchase of a bottle containing the human clone du jour. The consumer, whether an infertile couple, a couple desiring to replace a dying or dead loved one, or the egotist wanting to copy himself or herself, will become aware that the technology exists and their demands can be satisfied. If consumers are not able to have their demands met locally, surely they will shop elsewhere (eg, in a country that lacks enforceable restriction on reproductive cloning).

At this point the global community must begin to openly address the following issues and consequences as they relate to reproductive cloning:

1. The biological experiment. Will the global community permit/accept Frankenstein-like and worse consequences in baby-making attempts through cloning?
2. The experiment in human identity. How will putative human clones see themselves? Will they see themselves as distinct and unique? How will their psychosocial needs be met?

3. The experiment in human programming. How might genetic diversity and balance be affected?
4. The experiment in family and social life. A father could become the twin brother to his son. A mother could give birth to her genetic twin. Would all forms requiring demographic data inquire whether the form-filer is a clone? If so, what does that mean? Does it carry a stigma? Would clones be treated as disposable? As products?

So what about therapeutic cloning? The benefit of therapeutic cloning remains largely undiscovered because the value will be revealed only when the technology is clinically applied. Although results from current *in vitro* experiments portend clinical therapeutic success, more data are needed. The United Kingdom has recently permitted cloning by special license, and only to day 14 of embryo development. With the stage set, more data will come from ongoing research in the United Kingdom and other countries with less restrictive research policies. In the United States, the data will come as well, but much slower, through privately funded research and without appropriate oversight to ensure checks and balances. The absence of government funding as a result of President Bush's ban on the use of federal dollars for certain types of research instills and reinforces the notion in lay and other communities that research cloning is illicit, nefarious, and should be considered by all as morally wrong (this was also reinforced by the president's speech on the issue).

On July 11, 2002, *The New York Times* published the executive summary of a report by the President's Council on Bioethics (Stolberg, 2002b), which had been generated from meetings held earlier in the year (available at <http://www.bioethics.gov/transcript.html>). The Council agreed unanimously that cloning to duplicate a human was unsafe and unethical. Perhaps more important was the con-

clusion that cloning for biomedical research should not be banned outright, but rather prohibited during a 4-year moratorium, allowing time for more public debate. In a split vote, 10 of the 18 members of the President's Council on Bioethics supported a 4-year moratorium on research that uses cloned embryos, and it is applicable to all researchers regardless of whether federal funds are involved. Seven members of the council argued that the research should be allowed but only with strict federal regulation. One member abstained. The executive summary commented on the vote by saying that the difference in voting reflected "the differences of opinion in American society . . . some of us hold that cloning for biomedical research can never be ethically pursued, and endorse a moratorium to enable us to continue to make our case in a more democratic way . . . others of us support the moratorium because it would provide the time and incentive required to provide a system of national regulation."

While US government-supported nuclear transplantation research has been grounded, the nonregulated research genie has long since left the bottle and is currently flying without instruments amid heavy storms.

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