Since Scottish scientists succeeded in cloning the sheep known as Dolly, the prospect of human cloning has catapulted its way into the public consciousness. In early 2000, an Italian and a U.S. scientist announced their intention to clone human babies for infertile couples. The duo recently announced their plans to begin implanting cloned human embryos into women—a step they may have already taken by the time this article is published. On July 31, 2001, the U.S. House of Representatives passed the “Human Cloning Prohibition Act of 2001” (H.R. 2505) by a bi-partisan margin of 265-162 with support from liberal, progressive, conservative, pro-life, and pro-abortion members. This bill, which Rep. Bart Stupak (D-MI) and I wrote, is designed to ban human cloning for both “research” and “reproductive” purposes. Despite the fact that President Bush said he would sign this bill into law, Senate Majority Leader Tom Daschle (D-SD) prevented the bill from even being considered in the Senate. On Sunday, November 25, 2001, scientists at Advanced Cell Technology of Worcester, Massachusetts announced that they had created the first human embryo clones for the purpose of destructive research. It is now more important than ever to ban human cloning.

H.R. 2505 specifically bans “asexual reproduction” which is accomplished by “somatic cell nuclear transfer” technology, the technique that was used to produce Dolly. The bill does not ban scientifically and medically useful cloning practices such as the cloning of DNA fragments (molecular cloning), the duplication of tissue or cells in culture (cell cloning), or whole-organism or embryo cloning of non-human animals. Nor does the bill ban laboratory practices such as parthenogenesis or “twinning.”

While most cloning advocates want to create cloned embryos for embryonic stem cell research (and oppose the creation of clones who would be implanted and carried to term), others are racing to produce the world’s first cloned human baby. Indeed, scientists such as Panos Zavos and Severino Antinori stated in mid-2000 that they expected to begin implanting cloned human embryos into women in the next several months. They were enthusiastic about pursuing such a feat despite the serious genetic problems encountered in animal cloning, the known risks to the mother, and the great potential for serious birth defects. Ninety-five to ninety-seven percent of animal cloning attempts still end in failure, and the scientists who cloned Dolly failed 276 times before they succeeded in producing a single live-born clone of an adult sheep. Most scientific experts believe that attempts to clone humans will result in even higher failure rates. Scientists such as Ian Wilmut (who produced Dolly) and Rudolf Jaenisch (of MIT) have concluded that the most likely cause of abnormal development in cloned animals is faulty reprogramming of the genome. When the nucleus of a somatic cell is introduced into an enucleated egg, the DNA in the nucleus has to be “reprogrammed” in order for a human being to develop fully. If this reprogramming of the nuclear DNA does not go exactly right, abnormal gene expression of one or some of the more than 30,000 genes can result.

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First, research cloning can only be justified by the utilitarian calculus that prices the lives of the millions of people who could potentially be treated or cured as a result of the research over the lives of the embryos who would be destroyed in order for the research to proceed. However, it is never ethical to sacrifice one human life for the real or potential benefit of others. Second, it is unethical to view a human being—regardless of its age—as a means to an end. Even supporters of embryonic stem cell research and other human research have long opposed the so-called “special creation of embryos solely for the purpose of research.” However, this is precisely what is involved in research cloning.

To evade this criticism, proponents are now contending that stem cells from research cloning for purposes of research does not create human embryos, but only “activated” cells. Others are arguing that the term “cloning” should not even be used to refer to this process. As one scientist from Johns Hopkins stated in his recent testimony before the Senate, research cloning should be called “nuclear transplantation,” not “cloning.” If cloning is defined as the process of creating a new individual, then research cloning should be considered to be an unethical and illegal act.

Third, research cloning will undoubtedly lead to a new exploitation of women. In the current effort to create human embryos to create a sufficient number of viable stem cell lines, scientists will need to obtain large quantities of women’s eggs. To do so, women must be injected with superovulatory drugs and undergo an invasive procedure. The Washington Post recently reported that many of the side effects of the injections are abdominal pain and nausea; in some cases, there is even fatal perforation of the ovaries occurs, causing severe abdominal pain, and on rare occasions surgery is required which may kill the patient infertile. Contrary to women who assume the risks associated with egg donation in order to undergo in vitro fertilization, women who take such risks for the alternative of adult stem cells have already yielded several therapies that have been used to treat cartilage defects in children, restore vision to patients who were legally blind; relieve systemic lupus, multiple sclerosis, and rheumatoid arthritis; and cure severe combined immunodeficiency (SCID). Further, many ethicists and scientists have predicted that human clones would be plagued with undeclared but harmful genetic abnormalities. Such abnormalities might also be present in the tissues or cells derived from cloned human embryos. There are no current or feasible methods available to assess whether the genome of a cloned embryo is free of such defects.

Human cloning is a benchmark for public policy, and the legislative decisions made regarding it will significantly impact the future of many areas of science. The public is being told that research cloning is good because it will yield miraculous cures; however, even if scientists were able to produce cures as a result, research cloning will still be defended by those who wish to justify it on the basis of research. Indeed, it is possible that research cloning will also be the deciding factor in the coming debates over artificial intelligence, germline therapy, transgenics, etc. However, science is not a democracy. If we fail to ban all forms of human cloning, society’s continued ability to regulate or ban future scientific research will be seriously diminished in the name of autonomy and utilitarianism.

Human cloning for any purpose opens the door to a “Brave New World,” and we must shut that door now.

In addition to these ethical considerations, research cloning should be forbidden because it increases the likelihood of reproductive cloning. Preventing the implantation and subsequent birth of cloned embryos once they are available in the laboratory will prove to be impossible. The most effective way to ban reproductive cloning is to stop the process at the beginning, with the creation of cloned embryos. Since the overwhelming consensus is that research cloning should be prohibited, steps must be taken to ban research cloning as well. It is nonsensical to believe that we can ban one without also banning the other.

Finally, research cloning is likely to fall woefully short of its alleged promise. The Wall Street Journal recently quoted William Haseltine, chief executive of Human Genome Sciences, Inc., as saying “with regard to embryonic stem cell therapy that the medicine to commercialization is so long that I would simply not invest.” You may notice that our company Haseltine H. E. is not made any such investments, and we have been offered the opportunity many times. Furthermore, a recent New York Times editorial stated “we continue to enthusiastically encourage that cloning even though the majority of scientists agree that it is impossible to treat patients with cells derived from cloned embryos. The research has already moved on to investigating the alternatives.” While embryonic stem cell research has yet to produce a single therapeutic modality that has proven to be clinically beneficial, the morally unproblematic alternative of adult stem cells already yielded several therapies that have been used to treat cartilage defects in children, restore vision to patients who were legally blind; relieve systemic lupus, multiple sclerosis, and rheumatoid arthritis; and cure severe combined immunodeficiency (SCID). Further, many ethicists and scientists have predicted that human clones would be plagued with undeclared but harmful genetic abnormalities. Such abnormalities might also be present in the tissues or cells derived from cloned human embryos. There are no current or feasible methods available to assess whether the genome of a cloned embryo is free of such defects.

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Human cloning for any purpose opens the door to a “Brave New World,” and we must shut that door now. The Senate will most likely take up this legislation in February or March of 2002. However, we would favor a comprehensive ban on human cloning in a fight for both sides of the bill. President George W. Bush and Senator Diane Feinstein’s recently introduced bill to ban only reproductive cloning. You can call a difference? Contact your Senators by phone, e-mail, or letter. Please voice your support for H.R. 2105 at town meetings and in e-mails to the editor in your local papers.