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Does Science Trump All?

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It was a White House photo-op with a stern message: President Bush, surrounded by a passel of babies, warned last Tuesday against a Congressional bill that would increase federal spending on embryonic stem cell research. The legislation, which had threatened to veto, "would take us across a critical ethical line," he said.

Yet in some ways the president - and Congress, for that matter - had been upstaged only four days before. That's when South Korean biomedical researchers reported that they had developed an efficient method for obtaining human stem cells from embryos produced through cloning. Researchers hailed the work as a major breakthrough, one that eventually could make it simpler to get stem cells to study and potentially treat disorders, like Parkinson's and Alzheimer's disease.

The announcement also made plain for researchers an age-old truism: that the march of science and technology cannot be stopped. Slowed, maybe. Modified, probably. But halted completely? No way.

Yet President Bush and religious conservatives have staked much on the idea that they can stop cloning, even when it is undertaken for therapeutic purposes, as is the case with the Korean research.

And there's some evidence to suggest that they aren't just dreaming. While the history of science, and medicine in particular, is full of good ideas that met with opposition that was eventually overcome, there are other episodes where the opposition won out - often because those ideas were not good ones.

There has been much unsuccessful opposition to medical breakthroughs that are now almost universally recognized as beneficial, like vaccination, dissection and organ transplantation.

Blood transfusions, animal implants and in-vitro fertilization itself have all been met with religious objections. Most have been overcome. But there has been successful opposition to some boneheaded concepts like eugenics. Other bad ideas - the Tuskegee syphilis experiments and the vivisection of animals come to mind - have led to the overhaul of research practices and the development and refinement of ethical guidelines.

The debate over therapeutic cloning reflects this mixed history. For some people the research represents a treasure chest of potential therapies; for others it is a Pandora's box, the beginning of a slide toward a dystopian future where life is devalued.

In the end, the outcome of the debate may be determined by the course of the cloning research itself - whether the public believes at some point that scientists or their opponents have overstepped their bounds. And whether the rest of the world follows along.

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Protests to medical research in America began early. Inoculation, a precursor to vaccination, met with much opposition during the first big trials of the technique, in the 1721 Boston smallpox epidemic, said Ronald L. Numbers, a professor of the history of medicine at the University of Wisconsin. (Interestingly, he said, the trials were led by a minister, Cotton Mather, and many of those objecting were physicians, who thought he was playing God.) And when vaccination was developed some 70 years later, Dr. Numbers said, there were religious objections. But these dwindled as the benefits became apparent.

Similarly, Dr. Numbers said, there were protests in the late 18th and early 19th centuries against the dissection of cadavers for medical education. It's not clear how much religious beliefs were responsible for the protests, he said, "although you occasionally have discussions about, if you cut them into pieces, what's going to happen at the time of the resurrection?"

Nathaniel Comfort, an associate professor of history of science and medicine at Johns Hopkins, said that society's views on what is acceptable have changed over the years. When Jacques Loeb announced in 1899 that he had initiated embryonic development in sea urchins without the use of sperm, "the public reaction seems to have been one of awe and surprise and celebration," Dr. Comfort said.

Yet seven decades later, when the first successful work on recombinant DNA - a basic tool of genetic engineering - was announced, "there was this whole fear of playing God," he said.

"What leaps out at me is how culturally situated this notion of shock and horror at the engineering of life is," he added. "What is it about our times that raises these sorts of moral and ethical concerns?"

In the case of stem cells, some concerns are overshadowed by the tantalizing promise of the research: rejection-free organ transplants, regenerated spinal cords, perfectly matched blood transfusions, cures for diabetes and Alzheimer's.

But those promises run headlong into questions raised by a dark history of research. Take eugenics. According to Christine Rosen, a fellow at the Ethics and Public Policy Center in Washington and the author of "Preaching Eugenics," scientists who supported eugenics claimed that it could cure disease and end poverty - involuntary sterilizations were one result.

But the scientific underpinnings cited by early eugenics researchers were often wrong, Ms. Rosen said. "The heritability of certain diseases and eye colors were right, but broader claims they made as a result were incorrect," she said.

Many religious groups tried to stop eugenics, Ms. Rosen said, but they were called obstructionists.



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"The only thing that stopped this," Ms. Rosen said, "was war and the lessons of Nazi Germany and improvements in science."

The controversy over eugenics is particularly relevant to the current debate, argues Wesley J. Smith, an opponent of therapeutic cloning at the Discovery Institute, a conservative research group in Seattle.

When eugenics was popular, he said, "people at the top levels of society were accepting of the idea that you could improve the human race by improving the gene pool." Even the United States Supreme Court, he said, supported involuntary sterilization, in the 1927 case *Buck v. Bell*.

To Mr. Smith and others, the march of science toward therapeutic cloning can be stopped. Indeed, cloning may be halted by its own deficiencies, Mr. Smith said. Cloned animals have developed health problems, and there is a potential for tumors in cloned tissue. And research using non-cloned, adult stem cells, which are drawn from bone marrow and blood, "will not have the moral baggage of cloning," he said.

But Dr. Lee M. Silver, a geneticist who is a professor of molecular biology at Princeton, said that therapeutic cloning could not be stopped because the world has changed.

"The difference today is that we're a global village," he said. "Thirty or 40 years ago, Asia had no scientific prominence whatsoever. Now Asia is a real player in the world."

Indeed, the debate over the cloning bill in Washington is largely moot, he said, because the legislation would permit federal financing of studies only involving unwanted embryos from fertility clinics.

That's "too little, too late," he said. "What it would allow American scientists to do is far less efficient than what the Koreans have already accomplished."

"If there are other societies that don't have a problem with this, it's going to happen there," Dr. Silver added. "And that will have ramifications for things here."