

STATE OF THE ART

A SURVEY OF TECHNOLOGY AND SOCIETY, BY THE EDITORS

Human Cloning and Scientific Corruption <i>The South Korea Scandal</i>	113
The U.N.'s Net Gambit <i>Internationalizing Internet Governance</i>	117
The \$100 Laptop <i>A Flawed Plan to "Save the World"</i>	120
Morals and the Mind <i>Michael Gazzaniga's Ethical Brain</i>	121
'No Nation Can Afford to Ignore This Threat' <i>Pres. Bush on Avian Flu</i>	125
Notes & Briefs <i>Science Education, Wikipedia Accuracy, Mozart's Skull, etc.</i>	129

Human Cloning and Scientific Corruption

The South Korea Scandal and the Future of the Stem Cell Debate

The lurid details of the Korean cloning scandal are now widely familiar. Over the past two years, South Korean scientist Hwang Woo Suk and his research team reported several major breakthroughs in the science of human cloning. In 2004, they claimed to have produced the first cloned human embryos. In 2005, they claimed to have vastly improved the efficiency of their technique, producing embryonic clones of individuals with serious diseases and then disaggregating the embryos for their stem cells.

Both papers were published in the journal *Science* and welcomed enthusiastically by embryo research advocates around the world. Many American bioethicists applauded Hwang's "life-saving research" and praised his team's high ethical standards and humane treatment of egg donors. Many

American scientists hailed Hwang's achievement as a herald of great medical progress, and lamented that American science was falling behind due to inadequate federal support. The Korean scientists were so confident in their work—"holy, pure, and genuine," as Dr. Hwang described it—that they began setting up a global consortium to clone human embryos on behalf of less capable scientists elsewhere.

But over the past few months, their claims have dissolved one after another. First it turned out that they had not treated their egg donors so well after all. Instead, they had used eggs from junior scientists and graduate students on Hwang's own staff, a violation of the Helsinki Declaration; and they had paid other women for their eggs and then forced them to lie about it on their consent forms. Then it

became clear that Hwang's team had used hundreds more eggs than initially reported. This means that even the first small-scale human cloning experiments could not be carried off without massive numbers of oocytes illicitly obtained—hardly a reassuring harbinger of things to come in the age of so-called “therapeutic cloning.”

Dr. Hwang first denied these reported abuses and lies, then admitted his guilt when the evidence was clear. As he put it at the time: “Being too focused on scientific development, I may not have seen all the ethical issues related to my research.” With this first deception revealed, numerous others came to light in quick succession. It turned out that some of the photos attached to his team's 2005 *Science* article had been faked; then came word that some of the cell lines reported in that study could not be accounted for; then hints that those lines never even existed; then charges that in fact no embryonic stem cells from cloned embryos were ever really produced. It now seems likely that cloned embryos were never actually created at all.

This means that human cloning is not as far along as it appeared a few months ago, which is very good news. If Hwang's research were real, he would have been guilty of creating human embryos solely for research and destruction and paving the way for the age of reproductive cloning—ethical offenses far worse than lying to a magazine, with implications far greater than this scandal will ever have. But it turns out he was not quite

as bad as he wanted to be.

What Hwang has succeeded in doing, however, is unmasking some of the myths and fabrications behind the entire cloning enterprise, and bringing several key facets of the stem cell debate into unusually sharp relief.

To begin with, the Hwang scandal strikes at the notion that science should simply be trusted to govern itself, or that professional bioethics offers a sufficient guard against abuses. The most venerated pillar of the global scientific enterprise—the peer-reviewed journal—has proven to be of little avail against even the most rudimentary deceptions. *Science* is perhaps the most prestigious scientific journal in the world, and no one can doubt it takes peer review and corroboration very seriously. The system failed in this case not only because Hwang and his team were especially audacious liars, but also because the scientific establishment has become deeply committed to advancing the cause of embryo research and research cloning for reasons that are as much political as scientific.

One important journal, the *New England Journal of Medicine* (*NEJM*), has been up-front about this motive. In a July 2003 editorial, *NEJM* editor Jeffrey Drazen talked up the promise of research cloning, and then wrote: “I believe that such research must continue in the United States if we are to provide the best possible care for our patients. The editors of the *Journal* will do our part by seeking out highly meritorious manuscripts that describe

research using embryonic stem cells.”

Science magazine never quite so brazenly declared itself an advocate, but it was also never shy about using its editorial page to demand greater political support for embryo-destructive research. The climate in the scientific community more generally could only have contributed to this desire to score political points through scientific publications. It is hard to avoid the conclusion that in no small part the editors of *Science* accepted Hwang’s deceptions because they wanted to believe them, and that they wanted to believe them because, for various social, cultural, and political reasons they wanted human cloning, rather than any scientific alternative, to be the future of stem cell research. From now on, perhaps they should look in the mirror before screeching about the politicization of science.

Bioethicists would also benefit from some ethical soul-searching. Many of them were all too eager to celebrate Hwang’s work. They wanted the cloning revolution to begin, giving researchers the moral high ground against their zealous opponents. Laurie Zoloth, a bioethicist at Northwestern University, put it thus in an op-ed in the *Los Angeles Times*:

“We believed in the research, in part, because we liked the idea of the hard-working scientist from a humble background in a small, energetic country who leads the way with his intellectual skills and his dedicated team, working around the clock for human good. We liked that the South Korean research-

ers engaged in ‘brotherly’ collaboration that included American scientists, and that leadership roles were given to women.”

She believed in Hwang, in other words, because his work and his attitudes suited the prevailing worldview of contemporary bioethics. She was an advocate who provided cover for his project, not an ethicist with an eye to the dangers of the human cloning endeavor.

And Zoloth was by no means the worst offender in this regard. After Hwang’s unethical egg procurement practices came to light, another prominent bioethicist, John Robertson of the University of Texas Law School, argued that those raising red flags about Hwang’s methods were “making a mountain out of a molehill.” “The road to nuclear transfer research needs speed bumps but not barriers,” he wrote. “The science is tough enough.” And what of the actual offenses in Hwang’s treatment of egg donors? Hwang did “err in not coming clean up-front,” Robertson wrote, but “now that he has done his public *mea culpa* I say the time is to forgive him and let him get back to plying his considerable craft.”

The Korean fiasco also lays bare the broader deception underlying the campaign for embryo research and research cloning. In some cases, the dishonesty is blatant and orchestrated. When Robert Klein, chief advocate for last year’s \$3 billion stem cell and cloning referendum in California, told voters that the state’s new stem cell

institute would bring California many millions in revenue through royalties, he knew he was lying. As the *San Francisco Chronicle* put it, “What Klein knew before the election was that such royalty-sharing by the state might be hampered by federal regulations...yet he didn’t tell voters.” The California referendum campaign abounded in similar lies about everything from the promise of the research to the meaning of terms like “cloning.” The referendum stands as the most dishonest political scam in recent memory.

In most cases, though, exaggeration and deception are spread unknowingly by politicians, reporters, and advocates who genuinely believe what they are saying. Sometimes these claims are so jarring they easily stand out—recall John Edwards’s appalling statement in the course of the 2004 campaign that “if we do the work that we can do in this country, the work that we will do when John Kerry is president, people like Christopher Reeve are going to walk, get up out of that wheelchair and walk again.”

But in many cases the dishonesty has become so routine that regular observers of the debate are almost numb to it. How many times have you heard a member of Congress repeat the patently ridiculous assertion that, in this case quoting Senator Dianne Feinstein, “Embryonic stem cell research has the potential to help more than 100 million Americans who have deadly and disabling diseases and conditions”? How many times have you heard from the media the com-

pletely unsupported claim that, in this case quoting Pam Belluck of the *New York Times*, embryonic stem cells are so promising “because they have the potential to develop into any kind of cell”? Have you wondered whether more than one in three Americans really suffers from a deadly disease? Did you know that even in mice, where embryonic stem cell research has been going on for three decades, stem cells have only been differentiated into less than 10 percent of the cell types in the body?

These politicians and reporters are not intentionally lying, as Hwang did. They are repeating what they have heard countless times, because the stem cell debate is simply saturated with falsehoods, exaggerations, and unfounded claims. They believe these claims because they want them to be true, and because something repeated so often eventually comes to sound plausible.

But the idea of “therapeutic cloning” is very far from plausible. Even if they really believe it could be done, do research advocates truly imagine a massive worldwide enterprise gathering millions of eggs from millions of women, producing millions of cloned human embryos and destroying them all to provide cell treatments for millions of patients? This preposterous scenario is their idea of the future of medicine? This kind of nightmare is not only morally abhorrent but scientifically absurd and practically impossible.

Fortunately, stem cell research is not only stained with corruption but filled

with creativity. Which is why the lessons of the Hwang fiasco should not entirely crowd out the other great stem cell development of 2005: the search for alternative methods of deriving tailor-made, pluripotent stem cells.

In August, Kevin Eggan and his team at Harvard showed that by fusing a somatic cell to an existing embryonic stem cell, they could produce a cell with the genetic *identity* of the somatic cell donor but the *pluripotency* of the original stem cell. In other words: all the benefits of research cloning without harvesting mass numbers of oocytes or producing and destroying mass numbers of cloned embryos. Eggan's cells still had one too many nuclei, but this January Yuri Verlinsky of the Reproductive Genetics Institute in Chicago published a study showing his team had accomplished the same feat without the double nucleus problem. Such alternatives are now more

advanced than research cloning—a fact many research advocates seem reluctant to admit.

Of course, we should not allow hope to get ahead of the facts. Those seeking a technical solution to our ethical problems need to avoid the same egregious sin—hype colored by ideology—that has become so routine among many embryo research advocates, including many eminent scientists. But we should aggressively support these stem cell alternatives with federal dollars, and with a suitable dose of American optimism that “cell fusion” or other methods will give us some of what we want: medical progress, political consensus, ethical decency. Even a small success for such ethical stem cell research would do much to repair the damage that the Korean scandal has caused to the reputation of modern science, and to lift the dark cloud that needlessly hovers over the entire stem cell field.