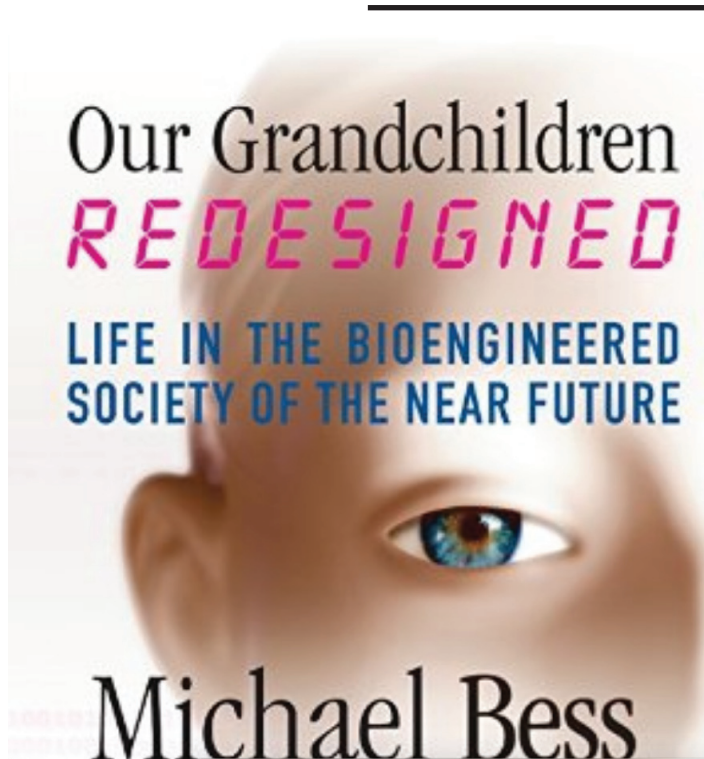


HISTORY AT VANDERBILT

An Interview with Professor Michael Bess

*Dr. Michael Bess, Chancellor's Professor of History at Vanderbilt University, is one of the leading scholars in his field. He is a specialist 20th- and 21st-century Europe, with a particular interest in the social and cultural impacts of technological change. His most recent book, *Our Grandchildren Redesigned: Life in the Bioengineered Society of the Near Future*, is a manifesto of biotechnology and its ability to create "superhuman" traits in future generations of human beings. The Editorial Board of the *Vanderbilt Historical Review* conducted an interview with Professor Bess to learn more about his research and teachings.*

By the Editorial Board of the *Vanderbilt Historical Review*
Vanderbilt University



Our Grandchildren Redesigned (2015)

Source: Google

Vanderbilt Historical Review: Your classes have generated a lot of enthusiasm and interest among students who we've talked to, so we'd like to give everybody a little taste. Could you give a brief elevator pitch about your new book, *Our Grandchildren Redesigned: Life in the Bioengineered Society of the Near Future*: what it is, what inspired you to write it, and anything else you'd like to share about it?

Dr. Michael Bess: I first got interested in this material back in the 1990s. I was watching *Star Trek: The Next Generation* and there was a robot character in that show who captured my imagination. His name was Commander Data. I found the idea of a machine that replicates human functioning fascinating: was such a thing really possible at some point in

the technological future? Or were we humans so special and distinctive in nature that no machine could ever come close to truly embodying the qualities that make us human? This led me to start exploring a hypothesis: the idea that machines and humans were on a convergent path. Here's the premise: The machines were getting ever smarter and more capable with the passing of time, and humans were integrating more and more sophisticated machines into their daily lives. Where would this convergence ultimately lead?

Out of this early set of questions, gradually, emerged the research project that became *Our Grandchildren Redesigned*. I decided that, long before we succeed in creating human-level robots (if we ever do succeed at that), we will have advanced a lot further in the other part of the convergence: altering human biology through the application of biotechnology. So I decided to focus my research on that.

The project ended up taking twelve years to complete, because I had to learn a great deal about basic science, engineering, and medicine as part of my research. This ended up being one of the most rewarding aspects of the project. I was drawn into entirely new areas of knowledge, some of which I hadn't even known existed—such as behavioral genetics, or machine learning, or the theory of complex adaptive systems. I began teaching seminar courses on these kinds of topics, sharing with my students the new material that I was encountering. This turned out to be a wonderful new dimension of my teaching, because these new courses attracted many students whose majors were in biology, neuroscience, engineering, chemistry, or Medicine, Health, and Society. These students brought with them an expertise that was enormously helpful to me, because they were able to ask informed questions from the perspective of their own disciplinary specialties. So I was learning with my students, and from my students. It was totally exhilarating.

In the end, I concluded that there were three principal forms of human bioenhancement: pharmaceuticals, bioelectronics, and genetics. Of these three, the pharmaceutical domain was

the first to arrive: our society has been exploring the possibility of using drugs to boost human capacities for decades now, and the process is accelerating. Bioelectronics are just emerging now as a new and exciting research field and commercial opportunity: there are technologies that allow paralyzed people to communicate with machines just by thinking commands; there are skull caps that read various aspects of your brain's activity and allow people to control machines; there are devices you can wear to boost your cognitive function; there are virtual reality devices that can transport you very realistically into immersive alternate worlds. Finally, of course, there is the domain of genetics. Here we're looking more toward the future, though genetic medicine is already a major undertaking today. Over the coming decades, there will probably be two pathways for enhancing human traits genetically: one will require making alterations to your DNA, while the other will leave your DNA intact and instead use epigenetic tools to modify which parts of your genome are activated or deactivated. The epigenetic pathway is particularly exciting, because it will be available to people at any point in their lives: it's not something that has to be carried out shortly after the moment of your conception. So, if it pans out, it will allow people to alter the genetic basis of their traits and behavior anytime they wish, throughout their lives.

In my book, I explore the potential consequences, both for individuals and for our society as a whole, if these three domains of bioenhancement do become a reality. I'm basically asking: what happens when millions of people are using these powerful tools to alter their bodies and minds?

VHR: On the note of those philosophical questions, could we ask you about a few that you bring up in the book?

The first is, the idea of the human rights aspect surrounding these new technologies. Obviously things like pharmaceuticals are already at play, and there's an ethical debate that could extend into things like physical rejuvenation, especially considering the health care debate that we have now in socialized health care. What are the human rights implications of these new technologies?

Bess: The most worrisome aspect of these technologies, to me, is the question of who gets access to them. Since many of these technologies will probably be very expensive, it is possible that rich people will be able to obtain these bioenhancements to a far greater degree than poor people. Even within a relatively rich nation like the United States, this disparity in access would pose a serious problem. But on a global scale, it would be even worse, because the disparities at that level are so much greater. My worry is that this could lead to a situation in which the global divide between haves and have-nots becomes much greater than it already is today. And think about it: this would no longer be a divide that you could remedy through improved education and access to food and health care. This would be a divide in the biologically based



An interview with Michael Bess (2015)

Source: *Research News @ Vanderbilt*

capabilities of humans: for some people it will mean greater health, greater longevity, greater mental acuity and memory, greater ability to control machines, greater facility of communication. And for others, it will mean missing out on all these advantages. The possibility of a vicious circle would be very real: the gap would just keep getting worse, generation after generation. I doubt that half of humankind will be content to just stand by and let this happen to them. There will be anger, and turmoil, and revolt, unless humankind finds a way to offer universal, subsidized access to these technologies to every person on the planet. That will be a very formidable challenge, indeed.

A second aspect that worries me is the potential for the commodification of human traits. People will be tempted to identify very strongly with the particular set of modifications they have made to their bodies and minds. Since they will be in a position to choose which enhancements to adopt, they will be constantly forced to compare one product against another: I like this technology because it allows me to have these new capabilities; I reject those technologies because they're weaker, or inferior, or less impressive. There will be a strong tendency here for people to forget that it's people they are talking about, and to start comparing one person with another as if they were cars in an auto dealership: this one is better than that one because it has a better performance profile. If this happens, then people will fall into a very dangerous trap: they'll tend to forget the idea of human dignity, which posits that each of us is a unique individual whose existence has infinite value regardless of what traits we have. Instead, people will slip into a mentality of comparing each other according to their different performance profiles. If we do this, we lose the basic underlying attitude of unconditional respect for other people. The principles of "one person,



Benson Hall, location of the History Department (2006)

Source: Commons Wikimedia

one vote,” of equality before the law, of equal opportunity, would be threatened, because all these principles rest on a fundamental assumption that each of us possesses infinite, intrinsic, and equal worth simply by virtue of being a human person. So commodification, which seems at first like a rather ethereal phenomenon, actually would pose a very serious threat to human dignity and human rights, which are the foundations of any democracy.

VHR: On the same subject, but in terms of its effect on art and culture, and the idea of memory and recounting the past, what implications does this have for those spheres?

Bess: There’s an interesting gadget I describe in my book, which suggests some of the ways in which human bioenhancement could affect the world of the arts. It’s called “the FeelSpace Belt,” and it was invented about a decade ago by a Dutch designer. He took a belt and put a dozen cell-phone vibration motors on it. Then he connected it to a small device that sensed the earth’s magnetic field. Whichever direction was pointing north, the belt would vibrate softly, indicating to the person wearing it which way was north. This is a very simple gadget, but it allowed the person wearing it to be constantly aware of which way was north. In this way, he had added a new layer to his sensorium: the ability to sense the presence of the earth’s magnetic field. His idea to do this came from reading an article about loggerhead turtles, which can sense earth’s magnetic field, and hence navigate very accurately across vast stretches of ocean. This man was trying to add to his own sensorium this additional dimen-

sion: seeing, tasting, touching, smelling, hearing—and now, orienting. The longer he wore the belt, over several months, the more he incorporated this new dimension into his daily awareness. By the end, he reported, even his dreams were tuned to North.

I imagine that biotechnologies will allow us to expand our senses and our aesthetic experience in many ways analogous to the FeelSpace Belt—but with potentially far more powerful results. For example, we may be able to tweak our optical sensorium so that we can sense other wavelengths of radiation including infrared or ultraviolet: we would start sensing flowers in the way that bees do. I have a chapter in the book in which I play out these kinds of scenarios, imagining what new possibilities these added dimensions of aesthetic sensing might afford to us in terms of artistic expression and communication.

VHR: It’s almost ironic in that it’s engineering an intuition.

Bess: Yes, absolutely. It reminds me of another remarkable technology that’s being explored today by a team of Japanese researchers. They’re working on a skull cap system that reads the ongoing activity in your brain’s visual cortex, and translates it into visual images on a computer screen. The idea is basically to be able to “see” on the screen what a person is actually seeing through the normal activity of their own eyes and brain. One possible application, which these researchers are excited about, would be to wear one of these skull caps while you’re sleeping. All night long the machine records the activity of your visual cortex while you sleep. In the morning you wake up, turn on your computer, and get to see some of the visual imagery that accompanied your dreams. So you’re now in a dialogue with your own dreams in a whole new augmented way. You may be able to share those images with other people, incorporate those images into poems, movies, and art.

VHR: These new technologies seem to have a multidisciplinary effect, affecting disciplines as diverse as psychology, public policy, history.

Bess: Yes, they tend to run through the entire gamut of human activities and experience. That’s what makes them so interesting (and challenging) to study: you have to adopt a truly eclectic approach in order to gauge the full range of their consequences. When you mention public policy and history, for example, it calls to my mind the topic I was exploring in class with my students today. I call it “facilitated remembering.” The idea is simple: you don’t need to presuppose the existence of fancy brain-altering technologies—all you need is the phenomenon that’s already happening all around us today, known as “the Internet of Things.” The point here is that we are all constantly creating digital traces of our activities, everywhere we go, with just about everything we do. If we extrapolate a bit from this rapidly rising tendency, you

get a scenario in which the number of documents, records, sources, images, and data available about you are gargantuan in nature. And all this information is easily searchable by increasingly powerful computers. What's the result? It's not far-fetched to imagine a future, say, fifty years from now, in which a person will be able to use this enormous database to reconstruct past situations with unprecedented accuracy. In a few moments' time, I could put together a fine-grained, detailed, and accurate portrait of just about any moment in my lifetime. This could have tremendous repercussions for our sense of who we are: sometimes the conclusions we reach, by delving in this powerful way into our own past, will be flattering or helpful or satisfying. At other times it could prove deeply disturbing: we may discover we've been deceiving ourselves about some pretty basic aspects of who we are and what we've said and done in the past. Now imagine the effect of this technology of "facilitated remembering" in our legal system and courtrooms. Both the prosecution and the defense will have access to an unprecedentedly rich archive of information about past deeds. It will presumably be much harder for people to get away with crimes they committed, or (conversely) to be falsely accused of crimes. And this profound set of consequences is merely an unintended result of the rapid rise of digital technology and the pervasive role it is coming to play in our lives. These kinds of unintended consequences are a major aspect of my research: my book explores the possibilities of such unwanted side-effects for a wide range of bioenhancement technologies.

the change in constructive ways. In other words, I'm arguing that, on balance, reform has been a more constructive factor in history than revolution. Strategies of slow, incremental change have succeeded far better at achieving the aims of historical actors than strategies of sudden, drastic change. I make this claim in the full knowledge that it can be qualified in all sorts of significant ways. Nevertheless, it leaps out at me from the mass of historical events with such intuitive force that I feel compelled to take it seriously. I bring it up here because it has major implications for how our society chooses to pursue the bioenhancement enterprise over the coming century.

Consider the three major revolutionary episodes of the modern era: 1789, 1917, 1949. These experiments with sudden radical transformation certainly brought about far-reaching impacts for the societies in which they occurred. But all three skidded eventually out of control, ultimately failing to realize the intentions of the people who had launched them. The political and civic revolutionaries in Paris ended up on the guillotine or under the iron rule of Napoleon. The Marxist ideals of 1917 became a bizarre Orwellian nightmare under Stalin. The Maoist principles of 1949 reached their apotheosis in the famine of 1958–1962 and vicious factional strife of the Cultural Revolution. I am not arguing here that these three great turning points did not also generate *some* significant positive effects, both directly and (especially) indirectly. Rather, I am underscoring the fact that, on balance, they failed to realize

“[W]hat happens when millions of people are using these powerful [bioengineering] tools to alter their bodies and minds?”

VHR: Is there anything else you'd like to discuss about the matter?

Bess: The conclusion I reach about all this, in my book, is this: we should go slowly, and with great humility, as we walk down this road. I reach this conclusion because the societal tendency will be to do the opposite: to rush forward headlong, adopting these technologies and developing new ones as fast as we can. The pressure will be enormous to go faster, faster, faster. And yet, I argue, the smarter path is one of humility, caution, and restraint. Why? Because if these changes come too quickly, and our society doesn't have the requisite time to adapt to them, there's a risk of our civilization being pulled apart. One of the main lessons I've learned as a historian is that massive societal changes that happen very quickly tend to result in profound dislocations in which millions of people suffer tremendously. When change happens more gradually and incrementally, on the other hand, our societal habits and institutions tend to be better able to absorb

the goals of the men and women who set them into motion, and ultimately led to disastrous outcomes that shattered millions of lives.

If one compares these titanic upheavals with three major reformist movements that took place during the same era, the contrast is striking. The campaign in the West for equal rights for women has unfolded over two centuries, beginning in the early 1800s. Eschewing violent methods, and adopting instead a tenacious strategy of incremental inroads and reforms, women have succeeded over a dozen generations in utterly transforming their status and power in the social order. This is not to say that full equality has been achieved yet, but if one compares the position of women in 1815 with where it stands today, the difference is breathtaking. A similar strategy—and similar success—have characterized those portions of the working-class movement that rejected revolutionary methods and embraced gradual reform instead. Over the same two centuries, their rights and power in West-

An Interview with Professor Michael Bess

ern democracies have steadily increased, as trade unions, the vote, public education, and direct political influence have slowly transformed their socioeconomic status. Again, the victory is not absolute or complete, but the contrast with the era of Charles Dickens could not be starker. Finally, the position of blacks in America offers yet another vivid example of reformist success. From the appalling conditions of the Reconstruction period to the presidency of Barack Obama, the change process has been long and hard, but a strategy of unrelenting, nonviolent pressure, aiming at one incremental goal after another, has gradually transformed the lifeworld of African Americans. Much remains to be achieved, but young blacks today face a dramatically broader universe of possibilities than their great-grandparents did. Gradual reform, in short, is not just morally superior because of its generally nonviolent character: it is also more *effective* in the long run, engendering forms of enduring change that penetrate deeply

into the fabric of society, altering hearts and minds as well as institutions.

When it comes to the pursuit of the enhancement enterprise, our society would do well to take the comparative history of reform and revolution into account. We should choose the long, slow, plodding road rather than the shining superhighway of radical change. Technological innovation may indeed be accelerating, but we should not allow it to transform our lives more rapidly than our social, cultural, and moral frameworks can absorb. If we permit enhancement technologies to advance too quickly, the resultant stresses could end up massively destabilizing our civilization, perhaps even tearing it apart. 🏛️

VHR: Thank you very much, Professor, for your time.

For Further Reading

Bess, Michael. *Our Grandchildren Redesigning: Life in the Bioengineered Society of the Near Future*. Boston: Beacon Press, 2015.

Bess, Michael. *Choices Under Fire: Moral Dimensions of World War II*. New York: Vintage Books, 2008.

Conrad, Peter. *The Medicalization of Society: On the Transformation of Human Conditions into Treatable Disorders*. Baltimore: The Johns Hopkins University Press, 2007.

Gore, Al. *The Future: Six Drivers of Global Change*. New York: Random House, 2013.

Holtzman, David H. *Privacy Lost: How Technology Is Endangering Your Privacy*. San Francisco: Jossey-Bass, 2006.

Hughes, James. *Citizen Cyborg: Why Democratic Societies Must Respond to the Redesigning Human of the Future*. Boulder: Westview Press, 2004.

Kass, Leon. *Beyond Therapy: Biotechnology and the Pursuit of Happiness*. New York: Regan, 2003.

Knoepfler, Paul. *GMO Sapiens: The Life-Changing Science of Designer Babies*. Singapore: World Scientific Publishing, 2016.

Macintosh, Kerry. *Human Cloning: Four Fallacies and Their Legal Consequences*. New York: Cambridge University Press, 2012.

McElheny, Victor. *Drawing the Map of Life: Inside the Human Genome Project*. New York: Basic Books, 2012.

Naam, Ramez. *More Than Human: Embracing the Promise of Biological Enhancement*. New York: Broadway Books, 2005.

Nussbaum, Martha C. *Creating Capabilities: The Human Development Approach*. Cambridge: Belknap Press, 2013.

Nye, David. *Technology Matters: Questions to Live With*. Cambridge: MIT Press, 2006.

Persson, Ingmar and Julian Savulescu. *Unfit for the Future: The Need for Moral Enhancement*. Oxford: Oxford University Press, 2012.

Pollan, Michael. *The Omnivore's Dilemma: A Natural History of Four Meals*. New York: The Penguin Press, 2006.

Seidensticker, Bob. *Futurehype: The Myths of Technology Change*. San Francisco: Berrett-Koehler, 2006.

Shanahan, Murray. *The Technological Singularity*. Cambridge: MIT Press, 2015.

Stock, Gregory. *Redesigning Humans: Choosing Our Genes, Changing Our Future*. Boston: Mariner, 2003.