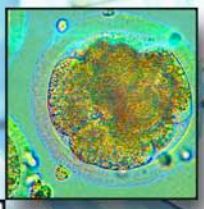
FALL 2003

"Which Way?"

A series of occasional papers published by The Frederick S. Pardee Center for the Study of the Longer-Range Future at Boston University

A Report by David Fromkin:

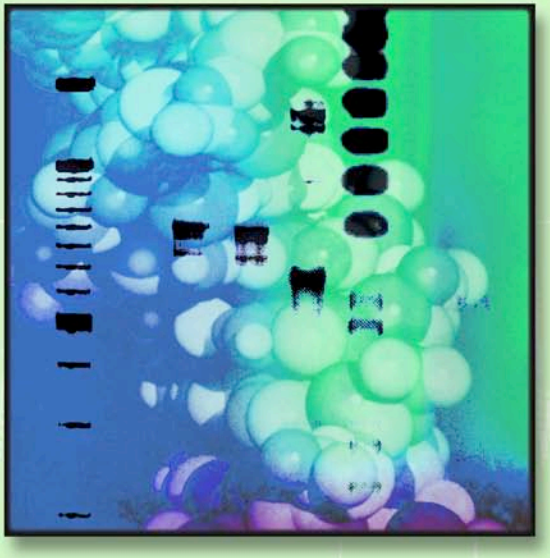
Must Runaway Science Be Regulated?

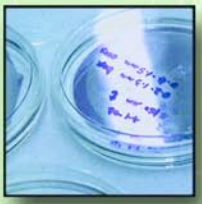


Which Way? pamphlets highlight emerging controversies at the crossroads: the crossroads where decisions must be made about choices that will affect the future of humankind through the twenty-first century and into the next. They are intended to illuminate, inform, arouse interest, and inspire debate among opinion-molders, decision-makers, and an informed and thoughtful public.

Which Way? pamphlets are published by Boston University's **Pardee Center for the Study of the Longer-Range Future,** established in 2000 to produce intellectual analysis of options for confronting inevitable change looking out 35 to 200 years. Pardee Center studies are intended to be international, interdisciplinary, non-ideological, and realistic.

For more on the Pardee Center for the Study of the Longer-Range Future, see *www.bu.edu/pardee.*





"Which Way?" SERIES

Controversies About the Future

Must Runaway Science Be Regulated?

A PARDEE CENTER PUBLICATION

A native of Massachusetts, **Frederick S. Pardee** received both a bachelor's and a master's degree from the Boston University School of Management. He worked for 13 years at the RAND Corporation as a systems analyst, studying long-term economic forecasts. He then spent several years working as an independent consultant, primarily for the U.S. government. In 1974, he turned his professional attention to managing his real estate investments, while actively maintaining his interest in studying the future.

In 2001, at the turn of the millennium, Mr. Pardee established the Frederick S. Pardee Center for the Study of the Longer-Range Future at Boston University with an endowed professorship and annual visiting professorship to consider the challenges that lie ahead for mankind in the decades to come.

For more information about the Pardee Center at Boston University, visit our website at www.bu.edu/pardee, *or contact us at* pardee@bu.edu *or 617-358-4000.*

In ancient cultures, wisdom tales warned that human presumption would be punished. The Tower of Babel was sent crashing down by God because it was being built too high into the sky. The wings of Icarus melted, and he plunged to his doom, because he flew too close to the sun. Adam and Eve were expelled from the Garden of Eden for seeking the knowledge that was forbidden. Pandora's crime, too, was curiosity: she took the lid off the box, thereby releasing into the world evils, diseases, and the need for hard work.

The modern world defines itself by rejecting the cautionary counsel implicit in such parables. Freedom of inquiry is the basis of the civilization of science that was born in Europe a thousand years ago and since has spread to much of the world. Progress has been made possible by ignoring apparent limits. We dare to do just about anything.

That became especially clear in 1945, when the explosion of two atomic bombs demonstrated that mankind soon would be able to release almost limitless energy. Humans, like Prometheus, had brought back fire from the sun. Prometheus, of course, was punished by the gods. It was clear even to observers in 1945 that mankind, too, might be punished: the wonderful and awful new power might be used to destroy the world.

Somehow or another that fear has lessened over the years. So has the dread of all sorts of potentially dangerous science and technology. When someone at a cocktail party explains that he or she is afraid of flying, and ends by saying, "If God wanted humans to fly, he would have given us wings," you are not (as would have been the case long ago) being offered a parable of the Daedalus and Icarus sort; you are being told, not a parable, but a joke. Opposition to inquiry and progress is not an attitude that is taken seriously today; it is the stuff of humor.

Our scientists are unafraid to tinker with just about anything: for them, nothing is sacred, it seems. Now, however, the modern world is approaching some dangerous frontiers, including the altering of human nature itself–and a real question arises as to whether researchers, without permission, should be allowed to cross that line. Should living creatures be cloned? Should they be altered?

Until recently we had supposed that human nature was unchanging. Optimists argued that it carried within it a potential for improvement, and even for perfectibility, while pessimists denied that claim. But it was common ground that, in the words of Rudyard Kipling, "For the Colonel's Lady an' Judy O'Grady/ Are sisters under their skins!"

The revolution in biology in our times has transformed the situation. Whether or not we all have one nature, we may now be able to change whatever nature we have.

Biogeneticists, having decoded the alphabet of life, increasingly are acquiring the ability to change traits in our offspring. That raises possibilities both wonderful and frightening. A group that included some of America's leading experts in these matters discussed their implications with one another in 2003 at the Frederick S. Pardee Center for the Study of the Longer-Range Future on the campus of Boston University. The scientists met—and their views clashed—at the forum that had assembled to consider "The Future of Human Nature." (For a more in-depth look at the issues and concerns raised, see the video of the conference at *www.bu.edu/pardee/conferences*.)

Lee M. Silver, a professor in the Department of Molecular Biology at Princeton University and also the Woodrow Wilson School of Public and International Affairs, told the assembled scholars that, given a choice, parents chiefly would use the powers released by scientific progress to give advantages to their children—as they defined "advantages." Happiness was not the goal parents would seek for their children by genetic engineering, he asserted; rather they would attempt to improve their chances of career success. For example, they would make the male children taller, because studies have shown that for every inch of height he has, within the normal parameters, a man earns a higher salary.

4 But Steven Pinker, M.I.T. professor and author of *The Blank Slate*, disagreed. He claimed that parents would be aware of the many dangers inherent in biogenetic engineering and would not be prepared to take the risk. Why gamble for more intelligence in your children if you also risk having them born paralyzed? Pinker also cautioned that the brain is complex, and that scientists still lack the ability to produce many of the changes in people that the conference was discussing. Pinker's was an assessment less confident than Silver's, who claimed that "We've entered a new age with the ability to control both genes and our environment."

But if all parents chose the same "desirable" traits for their children, homogenization would result, and the variety essential to evolutionary progress would be lost, a panelist objected.

A frightening picture of the future situation was painted by George Annas, chairman of the Health Law Department in Boston University's School of Public Health. "We might create a group of people much smarter than us, that might want to kill us," he warned. That raised another possibility: in a preventative strike, we might want to kill them.

Annas proposed the creation of a global institution—a world bioethics authority—charged with keeping science under control. It would be created by treaty, and the treaty would have teeth in it: it would outline procedures for arresting and imprisoning, or

otherwise punishing scientists who cross the line separating the permissible from the impermissible.

Pinker objected: "You're proposing committees that could easily stifle scientific research," he said. Indeed, science proceeds by unrestricted inquiry, by unimpeded experiment, and by full availability of all relevant information. Have we come to the point where our science poses too many dangers for us to allow it to continue—unfettered—as it must do if it is to function?

Writing in *The New York Times Book Review* of May 18, 2003, Dennis Overbye, science correspondent of the *Times*, reviewing *Our Final Hour*, a recent book by Martin Rees, Britain's Astronomer Royal, brings a catalogue of potential science-caused disasters to our attention. In the hands of a terrorist—a biological "Unabomber"—all sorts of Frankensteins could be manufactured using the technologies developed by genetic engineering. Catastrophes could also result from errors in the laboratory, in which scientists inadvertently invent new deadly diseases to which there is neither antidote nor cure. "Bioterror or Bioerror"—in Rees's phrase—opens doors into unimaginable horrors. The events of 9/11 have shocked us into a realization that biotechnology has provided terrorists with a whole new range of weapons of mass destruction.

On the other hand, another panelist interposed, half of the medical problems we look at today cannot be cured by today's therapies. So even if it is true that genetic pioneering endangers the human race, it also has the potential, by preventing or curing diseases, to safeguard the human race.

On October 16, 2003, the Council on Bioethics, appointed by the President of the United States, issued a report entitled *Beyond Therapy: Biotechnology and the Pursuit of Happiness*, which warned against current and future attempts to alter human nature. Seemingly, it urged the imposing of limits on science, at least in this area: cure diseases, yes; but "improve" people, no.

The arguments in favor of full freedom for science are both familiar and persuasive. Must they—should they—be reexamined in view of the extraordinary new possibilities, not merely for good but also for evil, that scientists have opened up? Geneticists are talking of changing us into a different species in 50 or 100 years, so that humanity would be a thing of the past; and perhaps changing other species as well. Does—does not—such power require some sort of responsible supervision?

"I love the human race," one panelist at the Pardee conference confessed plaintively. "With all our faults, I want us to stay as we are!"

Let us know what you think.

☐ Scientific inquiry should be regulated.

☐ Scientific inquiry should not be regulated.

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