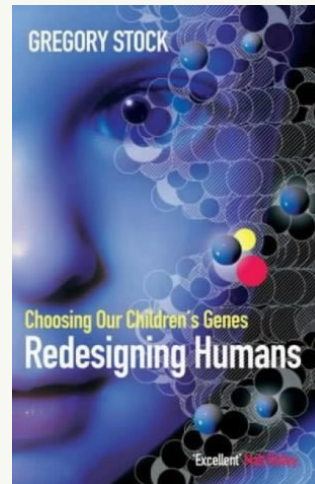


Custom-made genes

Redesigning Humans Choosing Our Children's Genes by Gregory Stock

288 pages, Houghton Mifflin Harcourt, \$22



Fancy an auxiliary chromosome pair to supplement the regular genome that your parents gave you? The potential advantages, according to Gregory Stock's ***Redesigning Humans: Our Inevitable Genetic Future***, would be plentiful.

That's because artificial human chromosomes could come without functional genes of their own. They'd thus comprise a kind of inert scaffolding or harness into which medical geneticists could "plug" whatever genetic modules you might be wanting--genes for HIV resistance, say, or for more efficient muscles. The genes on your natural chromosomes wouldn't be altered, so the customary argument against genetic modification--the risk of permanently introducing harmful traits into the human germline--wouldn't apply.

Artificial chromosomes could be introduced into both adults and children, and any genetic module that a person has could be turned off or deleted when an upgrade becomes available. "Imagine that a future father gives his baby daughter chromosome 47, version 2.0," Mr. Stock writes. "By the time she has a child herself, she finds 2.0 downright primitive . . . She may be too sensible to opt for some of the more experimental modules for her son, but she cannot imagine giving him her antique chromosome." Only the most brute Luddite, Mr. Stock suggests, will inflict on his kid a reversion to the natural genetic state.

All of which is so science fictional, you're probably thinking, that it's impossible in our lifetimes.

Think again. Artificial bacterial chromosomes have existed for years. The pioneering work on an artificial human chromosome was done at Case Western Reserve University in 1997. Now, Mr. Stock tells us, two companies are developing the technology, as a Web search can affirm.

Redesigning Humans is a thoughtful, informed book that will push all your buttons if discussions on genetic engineering incline you to defend the human condition's inviolability. But, Mr. Stock shows, just the next wave of in vitro fertilization, genetic diagnosis, and targeted pharmaceuticals amounts to such engineering.

Theologically based legislative bans will only make it harder to address the real risks in human modification as it inevitably emerges. Ironically, therefore, if you desire a scenario in which only wealthy children receive genetic enhancement, the United States is at a disadvantage to other countries, and the U.S. military has the unlimited ability to develop genetically engineered weaponry, you couldn't wish for much better than the current White House script.

Contributing editor Mark Williams lives in Oakland, California.