

Design-a-kid: Does humanity need an upgrade?

by [Bill McKibben](#) in the [May 17, 2003](#) issue

"People will be inclined to give their children those skills and traits that align with their own temperaments and lifestyles," writes Gregory Stock, an apostle of human genetic engineering who heads the program on Medicine, Technology and Society at UCLA. "A devout individual may want his child to be even more religious and resistant to temptation."

Well, that constitutes a vision. Indeed it constitutes a likely vision. Just as we now routinely shuffle the genes of plants and animals to produce a variety of outcomes (smarter, bigger, leaner), so we stand on the very edge of attempting the same thing with human beings. Plenty of scientists anticipate attempts in the near future at "germ-line engineering" of human embryos in an attempt to add or subtract particular traits. James Watson, the *éminence grise* of gene work whose discovery of the double helix 50 years ago we are celebrating this spring, has called on his fellow researchers to show some "guts" and "try germ-line therapy without knowing if it's going to work." He has proposed that they try to prevent "ugly babies" and "stupid people" and to reduce the odds that anyone will be shy or a "cold fish." "If we could make better human beings by knowing how to add genes, why shouldn't we do it?" he asked recently.

Confronted with new technologies, we tend to take refuge in old frameworks. Hence, when we consider "designer babies," we're most likely to start talking about "playing God," or try to connect the issue to the politics of abortion and reproductive choice, or decide that we should give scientists free rein in the hope that they might remedy some illness or another. But sometimes the issues raised by novel technologies are so fresh that they resist being herded into the old corrals. Rifles, for instance, were on some level a deadly extension of bows and arrows, and you could think about them in some of the same ways. But nuclear weapons weren't an extension of guns; they raised entirely new questions. Questions about the end of the world, for instance. They refused to fit neatly into the older categories of "just

war” thinking; we still struggle to make some kind of sense of them.

So it is with these new techniques. They raise entirely new questions about human beings, ones that we’ve never faced before. Most basically, they force us to ask if human life will have any meaning once they have come into common use. What I mean is, imagine you are the child whose parents have engineered you for piety and devotion, as Stock proposes. (Do not allow yourself the out of believing such a thing is necessarily impossible. We’ve pinpointed those regions of the brain that “light up” in moments of prayer and meditation; we’ve changed the sociability patterns of many animals. It is by no means uncertain that, sooner not later, we’ll know how to tweak the stretches of the genome that produce the proteins that make us tend toward devotion.) Now, you live your life of obedient faith—but obedient to what? To the proteins coursing through your cortex? What possible meaning would such faith have? A kind of literal brainwashing would have taken place, and the free will that makes you real would have been, if not eliminated, then perhaps overpowered.

And the same with a thousand other traits. Stock imagines musical parents turning their children into prodigies, and a parent who “feels so good about his optimism and energy that he may want more of it for his child.” Others have isolated stretches of DNA that seem connected to thrill-seeking, to aggressiveness, to happiness. The latter seems connected to a “dopamine D4 receptor, which contains a hypervariable coding in its third exon.” An Israeli research group found that certain variations of the gene made people much more likely to affirm such statements as “I bubble with happiness” and “I am a cheerful optimist.”

Dean Hamer, the chief of gene structure and regulation at the National Cancer Institute’s Laboratory of Biochemistry, wrote recently in *Scientific American* about his vision of a not-too-distant future in which an imaginary couple, Syd and Kayla, got to tweak the emotional makeup of their fetus. “They pondered the choices before them, which ranged from the altruism level of Mother Teresa to the most cutthroat CEO. In the end, they chose a level midway between, hoping for the perfect mix of benevolence and competitive edge. . . . Syd and Kayla, however, did not want to set their child’s happiness rheostat too high. They wanted her to be able to feel real emotions. If there was a death, they wanted her to mourn the loss. If there was a birth, she should rejoice.”

In one sense, of course, this is no different from what parents already do—try to mold their children into their vision of the good or successful person. But the story of

growing up is at the moment mostly the story of rebelling against that vision, or taking parts of it and molding them with your own aspirations. In the future, in the words of Princeton geneticist Lee Silver, “Parents can gain complete control over their destiny, with the ability to guide and enhance the characteristics of their children, and their children’s children as well.” It’s hard to rebel against the proteins pumping forever from your cells. In some ways it’s as if your parents drugged you from birth. Some do that now—and for some children it’s a blessing. But part of the blessing of Prozac is that you can stop taking it.

I think the next great question humans will face is whether to proceed with germ-line engineering—with designer babies. But before we can make the choice, we need to understand that such a ban would not rule out making use of genetic knowledge in other ways. For instance, scientists have already begun to pioneer so-called “somatic” gene therapy—injecting healthy genes into patients with diseases in an effort to cure those problems. The early results have been mixed but show real promise—and without the same kind of existential threats posed by enhancing embryos. Far more medical researchers are using our new understanding of genetics to finely tune cancer therapies or other treatments. And for couples who carry rare genetic diseases, screening of embryos now allows them to pick the ones that won’t grow up with cystic fibrosis or early onset Alzheimers.

Even controversial ideas like harvesting stem cells won’t take us into this sad new world, at least if we’re careful. Fetal stem cells, which may turn out to be useful for treating conditions like Parkinson’s, need to be cloned—that is, researchers need to take a cell from a body, put it in an embryo, and grow that embryo to a certain small size before harvesting the stem cells. Some abortion opponents have trouble with the whole idea of growing embryos as a source, as it were, of spare parts. But more worrisome is the fact that once you’ve cloned the embryo to get its stem cells, you could instead decide to grow it to full term—to produce an actual clone. Which is not only a big leap over the threshold of this empty new world, but also makes it much easier and more likely that we would go on to design babies, not just make copies. Still, such threats can be guarded against—a national panel recently recommended a temporary moratorium on stem-cell cloning until safeguards can be worked out to make sure it’s used for medicine, not for reproduction.

At the moment, that sensible compromise is stalled in Congress, caught between the right-to-life movement and the medical-research lobby. But in the long run, as I’ve said, it’s too novel an issue to be stuck in such a narrow hole. And in fact, many

environmentalists, human rights activists and feminists—all of them worried about designer babies—have begun to join with certain conservatives in common and sensible cause. Led by the Council on Genetics and Society (genetics-and-society.org), they've signed petitions, sponsored legislation and joined with similar groups across Europe and around the world. A new political battle is joining—not that we really needed another item on our agendas. But the world doesn't wait for quiet moments.

Nonetheless, if we are to stand up to the challenge presented by this kind of technology, it will take more than coalitions and petitions. It will require a long hard look at ourselves. It will require deciding if we're essentially good enough as we've been made, or if we need to move beyond humanness as we have known it toward some more exalted realm.

In early August 1999, a man named Max More stepped to the podium of a California conference hall. (He'd been christened Max O'Connor, but chose his new name as a sign of commitment to "what my goal is: always to improve, never to be static. I was going to get better at everything, become smarter, fitter and healthier. It would be a constant reminder to keep moving forward.") He looked out over the audience of his fellow "Extropians," gathered for their fourth convention (he'd chosen the name as the opposite of "entropy"), then delivered a talk titled "The Ultrahuman Revolution: Amendments to the Human Constitution." Taking the form of a letter to Mother Nature, it began by offering brief thanks to her for "raising us from simple self-replicating chemicals to quadrillion-celled animals." He went on, however, to list the "many ways you have done a poor job with the human constitution. You have made us vulnerable to disease and damage. You compel us to age and die, just as we are beginning to acquire some wisdom. . . . You held back on us by giving us a perceptual range less than that of other animals. You made us functional only under narrow environmental conditions. You gave us a limited memory, poor impulse control and tribalistic and xenophobic urges. And you forgot to give us the operating manual!"

As a result, More continued, "We have decided that it is time to amend the human constitution. . . . Over the coming decades we will pursue a series of changes in the human constitution, initially through biotechnology, and guided by critical and creative thinking." He proposed seven such amendments, including: "We will take charge over our genetic programming and achieve mastery of our biological and neurological processes . . . refining and augmenting our physical and intellectual

abilities beyond those of any human in history” and “we will cautiously yet boldly reshape our motivational patterns and emotional responses. . . . We will seek to improve upon typical human and emotional responses, bring about refined emotions.” Taken as a whole, he said, “these amendments to our constitution will move us from a human to an ultrahuman condition.”

More, whose coterie includes many of the big names in these new sciences, listed all the particulars of this new creed. (It’s important to remember that, to one extent or another, every item on his list has already been accomplished in the lab with other animals. We have worms living seven times as long, and mice running mazes twice as fast. He’s talking big, but not impossible.) But beyond that, he captured the basic dogma: that *human beings simply must push on*. Forget all the practical arguments why this work is inevitable—the difficulties of surveillance, the cheapness of the equipment, the lure of big money. At bottom, the advocates insist, it’s inevitable because human beings inevitably move forward, expanding their powers. In 1492 Columbus sailed the ocean blue; in 1969 Neil Armstrong took “one giant leap for mankind”; and sometime very soon there will be a baby born with improved hardware. By our nature we must crack the nucleus of the cell—from the human we jump to the “ultrahuman” and someday doubtless the doublesuperultrahuman.

Like Columbus sailing west, we have only the vaguest notions of where we might be heading. An “unboosted human brain” could never have a real conversation with one of the coming immortals, writes Damien Broderick, and could never know “what vast issues” it was considering. Oh, we can guess at the wonders, just as Columbus anticipated spice and gold. One of More’s colleagues, a Swedish philosopher named Nick Bostrom, took to the podium at the same conference to predict “orgasms and aesthetic-contemplative pleasures whose blissfulness vastly exceeds what any human has yet experienced,” as well as “love that is stronger, purer and more secure than any human has yet harbored” and “values that will strike us as being of a far higher order than those we can realize as unenhanced biological humans.” But in fact the final destination hardly matters—what’s important is the trajectory, the surge, the momentum. Forever upwards, forever more, forever restless. That’s the reason, in their view, that we have minds—to push forever ahead, transforming ourselves ever and again into something new. If our destiny lies ever further on, always just out of our grasp—well, who are we to argue with destiny? Homo sapiens will be left behind on the accelerating curve of progress, and our descendants will be off to the stars or the computer banks or some other place too complicated for us to

understand in our current primitive state.

But if all this sounds grandiose, it's in fact just the opposite. The reason the technotopians can talk so casually about the "posthuman" future is that they find nothing particularly significant about the human present. According to them, we don't engage in this constant push forward because we're so high-minded or passionate or special. We do it because we're not special at all. Because we *literally* have no choice. Nothing about us sets us apart from other organisms. Our bodies are "nothing more than bio-molecules interacting." As Robert Haynes, president of the 16th International Congress of Genetics, told his organization, "for at least 3,000 years, the majority of people have considered that human beings were special . . . What the ability to manipulate genes should indicate to people is the very deep extent to which we are biological machines. . . . It's no longer possible to live by the idea that there is something special, unique or even sacred about living organisms." This is no small point. Provided you believe it, you can stop worrying about human meaning disappearing because it wasn't really there to begin with.

That humans still believe in something mystical is an anachronism, these prophets believe—one that will fade as we turn these new discoveries into technologies. "Who will need an eternal life-giving God when eternal life is available by alternative and real means?" writes one futurist. Eve, Prometheus and Pandora all shrunk the domain of the gods—and now we shall do so again, finally, permanently. Who would you worship as your creator if your genes came from Pfizer? Eventually, like all other meanings, religion would wither away, except perhaps for those poor souls programmed for piety, nodding away over their beads. That's a lot of human legacy to dispense with, but we might well do it. In fact, according to the technotopians, we *will* do it. We have no choice; we inevitably push forward. It is our destiny, and destiny is inescapable. We can't be in control. *We aren't special.*

Except for one thing. Just one small thing that the apostles of our technological future have overlooked. One small thing about us that actually does set us apart.

What makes us special is that we can restrain ourselves. We can decide not to do something that we could do. We can set limits on our desires.

Consider the beavers that live behind my house, the beavers I hear slapping almost every night on the marsh they've built in the aptly named Beaver Brook. Beavers, slapping their tails against the threat of passing canoes, possess a kind of goofy

charm—they're about my favorite animal. Still, there is something remarkably compulsive about them. One year a family built a small lodge on our pond, and the male swam across each evening on his way to work. He was as regular as a Swiss train, five o'clock each afternoon; you expected to see him carrying a lunch bucket. He and his crew build dams. They need to, in order to make sure that the holes to their lodges stay safely below water. And they need to gnaw on trees, or else their teeth will keep growing till they wedge their mouths permanently open. These needs have turned into what we call instincts. Strong instincts. If you want to see a beaver here's all it takes: Sneak out to a dam and pull a couple of logs out (easier said than done—beavers are remarkable builders). The sound of water trickling down the dam will, within a very few minutes, bring them from their dens. They need to staunch that flow.

Now, we all have that beaver drive within us. (In fact, we have it in spades. Beavers content themselves with one dam at a time. No beaver has chains of dams. They don't franchise dams.) When the engineers say that we are driven constantly to surmount any limit, we know what they're talking about. Robert Frost once wrote a poem about a man who planted a peach tree outside his New England home, and then spent the coldest night of the year wondering if it was surviving the chill. "What comes over a man, is it soul or mind/That to no limits and bounds he can stay confined? . . . Why is his nature forever so hard to teach?" asks Frost. Only the advent of spring will tell if the tree has survived. "But if it is destined never again to grow/It can blame this limitless trait in the hearts of men." This "limitless trait" has led each of us to both glory and shame; it is integral. Even the saints feel it; indeed, in their struggles they feel it more than most of us.

But this limitlessness is not all there is to us. We are also the creature that can say no. The creature that, in Erazim Kohak's lovely phrase, can "subordinate greed to love."

Take dams, for instance. We build them too, obviously—build them higher than beavers do, build them stronger. I've seen the largest earthen dam on the globe, built by Hydro Quebec on the LaGrande River near Hudson Bay. A dam so mighty that its spillway could carry the combined flow of all the rivers of Europe. On the other hand, we also *don't* build dams. The modern environmental movement got its start when John Muir formed the Sierra Club to battle the dam planned for a California canyon called Hetch Hetchy. He lost that fight but in the process saved Yosemite, just as David Brower, the great late-century American environmentalist,

saved the Grand Canyon from a plan to plug the Colorado. They were able to rally people by appealing to the other parts of our nature, the parts that aren't always striving and questing and grasping. Not the limitless parts, but the limiting parts. The parts that understand beauty and scale, the parts that sympathize with the rest of creation, the parts that can imagine sufficiency.

Hydro Quebec built that huge dam on the LaGrande, but so far its plans for even bigger dams have been stalled; across North America, people concerned about the rights of the Cree Indians, about the caribou, about the sheer existence of a vast wilderness, have scrapped and battled to rein in the project. In 1999, Interior Secretary Bruce Babbitt pushed the plunger to dynamite the Edwards Dam on the Kennebec River in Maine—the first operating hydroelectric dam in the nation ever to be intentionally destroyed, in this case to make way for fish. “This is a statement about our capacity to honor and respect God’s creation, the sacramental commons, and to live not just in the past, but in a visionary and different future, in a way of harmony and balance with creation,” said Babbitt.

It's this ability to limit ourselves, to recognize that something may be perfectly understandable and yet be wrong, that makes us different from the other animals. Not *better*. You could argue that the rest of creation manages to observe these limits with enormous elegance—automatically, without even trying. But different, as birds with their hollow bones are different, and dogs with their sense of smell. We are the creatures that can voluntarily rein ourselves in. We are, in some sense, the sum of our limits.

And though it galls the apostles of technology, this idea of restraint comes in large measure from our religious heritage. Not the religious heritage of literalism and fundamentalism and pie-in-the-sky-when-you-die. The scientists may have drowned the miracle-working sky gods with their five-century flood of data. Copernicus and Darwin deprived us of our exalted place in the universe. But this older, deeper, more integral religious idea survives. Indeed, it thrives whenever man is knocked from his pedestal, for it has always held that meaning matters more than size, that we are great precisely as we are able to make ourselves small. It is Yama, the King of Death, explaining in the Upanishads the choice between *preya*, that which is pleasant, and *shreya*, that which is beneficial. It is Gilgamesh, the great hero, reminded that immortality is not for man. It is Job, finally silent and satisfied before God and the splendor of creation. It is Jesus, tempted in the desert by the nanotechnologist of his day: “If you are the son of God, command these stones to

turn into bread.” And refusing, in words that still carry a charge, “Man does not live by bread alone, but by every word that proceedeth out of the mouth of God.”

In this long tradition, meaning counts, more than ability or achievement or accumulation. Indeed, meaning counts even more than life. From this perspective, Christ’s resurrection is no more important than his willingness to die, to impose the deepest limit on himself for the sake of others.

The entrepreneurs of the germ-line have found their house preachers, of course. For instance, Richard Seed, a Chicago scientist and “serious Methodist,” was one of the first to announce he would set up a cloning lab: “God intended for man to become one with God,” he said. “Cloning and the reprogramming of DNA are the first serious steps in becoming one with God.”

But that kind of enthusiasm barely touches the core of our religious understanding. In the Western tradition, the idea of limits goes right back to the start, to a God who made heaven and earth, beast and man, and then decided that it was all enough and *stopped*. “And on the seventh day God ended his work which he had made.” At the time that we were told we were made in the image of God, all we really knew about him was that he thought the world was good, that he wanted us to take care of it, and that it was time to take a rest. We take that rest still—Sabbath, Shabbat, is the weekly reminder of this other religious tradition. Not the one that puts us at the center, but the one that asks us to move ourselves out of the center. The same tradition that stretches back to the Buddha and runs up through Thoreau, the constant countercultural witness, the never-ending whisper in our ear that we’d be happier, more satisfied, the more we laid aside our hopes for immortality, for power, for wealth. If we turned the other cheek.

This tradition has never disappeared—but it’s never carried the day, either. Most of us mature only part way—we learn, hopefully, to place our family or our community or our deity nearer the center of our lives, but only in rare cases do we really vanquish that limitless quality, that striving, that grasping. And in recent centuries we’ve come to embrace our selfishness—our hyperindividuality—with an almost religious fervor. A few epidemics of questioning have occasionally swept the land—the countercultural ’60s, for instance—but they didn’t last long, and were easily co-opted. Sunday means football and shopping as much as it means rest. The choice between enough and more has always been a choice we could put off a little longer, in our own lives and in the life of our civilization.

But now it's crunch time. Faced with a challenge larger than any we've ever faced—the possible quick erosion of human meaning—we need to rally our innate ability to say no. We will be sorely tempted to engineer our kids, but it's a temptation that we need to resist as individuals, and to help each other resist as a society.

The choices we face, in fact, will settle this question of specialness once and for all. If we cannot summon our ability to use self-restraint, or if it proves too weak, we will leave our specialness behind forever. Because once we start down the path of turning ourselves into machines, of writing ineradicable programs for our proteins, then there will be no way, and no reason, to turn back. We'll do what our programming indicates, never knowing how much choice we really have. We'll be like obsessive compulsives. For them, some accident of wiring or chemistry has overridden their ability to choose. They feel as if they have no choice. (But tough as their condition is, it can yield to the liberating effects of reflection, therapy, medicine.)

It won't be faulty wiring, though, that robs the engineered of their agency—it will be intentional programming. We'll do what we're supposed to do—we'll be brainy or brawny or pious. We may not feel sad—we won't necessarily want to be liberated from the way we are programmed—but we'll live in a world where our specialness really has vanished. The tensions, in other words, between our limitless nature and our capacity for self-restraint would simply disappear. We'd be on the "more" track. If you're designed to be athletic, more speed and power will always be your choice, and your choice for your children. The tension between that athletic part of you and the other parts will simply disappear—you won't question yourself at mile 23 of the marathon. If you're designed for piety, the temptations of the world may barely arise. Because, of course, those tensions are inefficient. They keep us from being all one way, one thing. From specializing emotionally.

But that inefficiency, that tension, that tug in different directions is what we call consciousness. It explains novel-writing and rock-climbing and churchgoing, and it explains both the difficulties and the glories of family and community and love. Machines don't have that tension, and the other animals have replaced it with a kind of grace. Consciousness doesn't make us better than robots and rhinoceri. It just makes us different. It just makes us human.

The idea that by escaping the body we will become "everything" fits very nicely with the economic worldview that we can never be sated, with the scientific paradigm of

eternal progress. But in the back of our heads a much older wisdom whispers
“escape your limits and you become—nothing.”