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Imagining the Future

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To think about technology is to think about the future. It is, unavoidably, to speculate and to predict, to imagine how our lives might be affected by new tools, new methods, and new powers. Most arguments about technology are therefore really arguments about the future. They give voice to different sorts of expectations about progress and change, and to different sorts of intuitions about the character of human life. The particular technology being debated is often secondary to these larger much-disputed themes, and the public debate is shaped by different ways of imagining the future at least as much as by the specific technical potential of a new device or technique.

This has certainly been the case in the most prominent set of arguments about technology in America today—arguments about human biotechnology. For at least three decades, but especially since the late 1990s, the future of these biotechnologies has been a hot political issue in this country. Novel prospects for manipulating nascent human life, enhancing physical or mental powers, reshaping the life cycle, or otherwise exercising unprecedented control over our biological selves have increasingly been fodder for public argument. Advocates and critics of these emerging powers tend to agree about one thing: biotechnology will play a critical role in shaping the future of humanity.

But how we conceive of that role has a great deal to do with how we think of the future more generally. At issue are not exactly different sets of predictions. At its extremes, each side in the biotechnology debates may indeed have some specific image of the future in mind, whether of a post-human techno-utopia or of some static nostalgic ideal. But for the most part neither side pretends to know exactly what is coming, and both recognize that the future will not yield any one permanent or stable state but a dynamic and constantly evolving experiment in human living—just like the past and the present. Rather than specific competing predictions of the future, at issue in these controversies are different ways of imagining the future in general, and different ways of thinking about some large and basic questions: What is the future? How do we get there? Who lives there? What matters most about it?

Such questions are rarely taken up so explicitly, of course, but behind the arguments of different partisans in the biotechnology debates there clearly lurk a set of rudimentary assumptions about these very subjects. These assumptions

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tend to coalesce into two broad schools of futurism: one thinks about the future in terms of future *innovations*, and the other thinks about the future in terms of future *generations*. The differences between them explain a lot about our contemporary technology debates. Each is too easily and too often caricatured by the other, but if taken seriously, each also offers a rich and compelling anthropology of progress—a sense of how the future happens in real human terms.

The biotechnology debates offer a uniquely vivid opportunity to examine these competing anthropologies of progress, and to see whether they point us to a reasonable and recognizable understanding of the human experience, and therefore whether they can be relied upon to guide our thinking about the future.

The Anthropology of Innovation

To imagine the future in terms of innovation means, most fundamentally, to imagine change in terms of new ideas, and to think of life as an array of individual experiments and choices. It is to ask how we might best encourage innovation, how we might allow the best innovations to flourish (and the worst to be rejected), and how new ideas allowed to thrive can alter human life.

This may be the more familiar and—to us liberal, forward-thinking Americans—the more obvious approach to thinking about our future. For better or worse, the future will be shaped by the innovations and advances of the present: by what we develop, what we build, what we learn, what we discover, what we try and test and deem worthwhile. Progress, in this sense, is made possible by improvements in our knowledge and understanding, our abilities, our circumstances, our institutions, our technology, and our control over nature and chance. There is of course always a danger that we may misuse our newfound powers, or even that they might corrupt us; but there are also reasons to believe that we will learn to use them responsibly, and that they will enhance our lives and improve our world. Armed with a sense of the potential pitfalls, we stand a good chance of using our new technologies well.

Not surprisingly, in the debates over biotechnology this innovation-driven view tends to be favored by libertarians of all parties—those who oppose restrictions on new techniques and technologies. This is not because they share some simple-minded optimism about biotechnology, but because they share a faith in the processes that drive innovation and progress in a free society, and believe that impeding these processes, or even trying to control them in advance, will only make things worse. They do not deny that serious difficulties may arise as the result of new innovations and technologies, but on the whole they argue that these difficulties can be overcome by the very same method that best serves innovation: trial and error governed largely by individual choice.

Indeed, if we think of the future primarily in terms of human innovation, then this dynamic and unmanaged trial and error process turns out to be the all-

important filter that determines what tomorrow will bring. After all, it is usually foolish to try to control or even to predict the course of future developments in science and technology, and so any attempt to govern technology with strict rules determined in advance will probably fail to encourage the best and to prevent the worst. Rather, the way to assure that the best practical innovations ultimately triumph is to assure that new ideas are put to the test of real-world use, so that only those that turn out to be good for us are kept. Those individuals most directly affected by some new innovation will be best able to judge its value, and if they find it is harmful or not worthwhile, they will reject it. This understanding of the future implies that the most constructive and sensible policy regarding the new is to place as few constraints as possible in the way of innovation and as few limits as possible on the individual's power to choose.

The combination of innovation and choice, each feeding back into the other in a self-correcting process, will work in a complex, unpredictable, but highly effective way to secure for us a future that works, even if we could not have imagined it. The future, after all, is *our* future, and so we are likely to make choices and to judge the consequences of our choices in ways that look out for our own best interests, and therefore that seek the best sort of future. As Virginia Postrel notes, in laying out her own engaging version of this view, "by shaping our individual lives, choosing among and arranging the things we do control, we form a larger pattern that is under no one's control, yet is complex and orderly."

This anthropology of innovation is founded in a recognition of the intricacy and volatility of human life, and in the sense that both good and bad ideas may emerge from wholly unexpected sources, so that in thinking about the future we must above all be prepared for the unexpected and make room for it. This means not closing off potential avenues of progress simply because we can imagine how they might lead society astray. We can never really know where anything will lead, after all, and it would be unfortunate to lose out on a possible advance only because we could not have imagined it. "Humiliating to human pride as it may be," wrote Friedrich Hayek, "we must recognize that the advance and even the preservation of civilization are dependent upon a maximum of opportunity for accidents to happen."

This general vision offers an account of the human condition that we can readily recognize. It is the logic behind much of our liberal democracy, our free market economy, and our culture of individualism, and so has probably been responsible for more liberty, prosperity, and plain human happiness than almost any other set of ideas in the history of the human race. It is closely akin to the modes of thought that underlie the modern ideal of progress, and it also coincides nicely with the worldview of modern science and its devotion to trial-and-error experimentation, to an unimpeded freedom to inquire and explore, and to a forward-looking faith in progress. It is therefore no surprise that those most

adamant about this way of imagining the future are also especially adamant about defending science and technology from regulation or restraint in the political system. Modern science and its progeny are agents of this kind of innovation, which is possible only in an environment that nourishes experimental liberty.

This underlying vision of the future does, however, suffer from two particularly noticeable weaknesses, both of which are especially apparent in the biotechnology debates.

The Lure of Utopia

The first weakness is an inclination to utopianism, with many of its attendant eccentricities and dangers. This may seem like a peculiar charge to lay at the feet of so dynamic a vision of the future. After all, the anthropology of innovation, even if it yields in glowing prophecies of better days to come, is not quite utopian in the conventional sense, because it usually does not envision an ideal, stable, blissful end-state toward which all innovation is tending. Rather, it imagines an open-ended process of progress, by which new ideas and new knowledge are turned into new power and put in the service of the pursuit of happiness.

Still, as Hans Jonas suggested in *The Imperative of Responsibility*, this view may be utopian in a deeper sense, and especially in the context of biotechnology, because it accepts at least as an option the possibility of profound and potentially permanent alterations in the human condition—indeed, in the nature of the human being. The prospects of genetic selection or manipulation; of mood, memory, or personality control; of radical life-extension, and similar biotechnological possibilities add up to the prospect of taking our own nature in hand and making it an object of manipulation and design. In practice, this entails alterations of those facets of human nature that have always been the permanent backdrop against which all other change has occurred and been measured, and that have always been the solvents of dangerous utopian fantasies.

Utopian experiments were bound to fail, in Winston Churchill's prescient words, because they were "fundamentally opposed to the needs and dictates of the human heart, and of human nature itself." Libertarian critics of communism often made this a central tenet of their case. But if our nature is in our hands, and our intrinsic inclinations and desires can be managed, then no such limitations would restrain utopian ambitions—especially if they were only exercised at first at the level of the individual.

In some of its more extreme formulations, the short distance between the innovation-driven vision of the future and utopianism is very easy to see. *Converging Technologies for Improving Human Performance*, a report released last year by the National Science Foundation, offers a glimpse of this sense of the future. The report makes a case for human progress through relatively free technological innovation, and then argues that technologies for radically improving

and remaking human performance will initiate a process of "changing the societal fabric towards a new structure." If it is not held back by ignorant critics, the report argues, the convergence of nanotechnology, biotechnology, information technology, and cognitive science may spawn "a golden age that [will] be an epochal turning point in human history." Indeed, it continues, "technological convergence could become the framework for human convergence—the twenty-first century could end in world peace, universal prosperity, and evolution to a higher level of compassion and accomplishment."

Assorted "transhumanists" and "extropians" dream of even greater things, including liberation from the bonds of the body and the possibility of endless life. According to the prominent transhumanist writer Max More, "death is an imposition on the human race and no longer acceptable." Therefore, he continues,

> to Extropians and other transhumanists, the technological conquest of aging and death stands out as the most urgent, vital, worthy quest of our time.... Certainly, the achievement of posthuman lifespans will require extensive revision of our way of life, our institutions, and our conception of our selves. Yet the effort is worth it. Limitless life offers new vistas, unexplored possibilities, unbounded self-development.

Indeed, the genuine expectation of conquering death has long been a hallmark of the more extreme formulations of the innovationist approach to the future, and of the hopes it tends to place in modern science. As far back as 1793, English philosopher William Godwin looked forward to intellectual advances that could bring about a "total extirpation of the infirmities of our nature," including not only pain and disease, but also melancholy, sloth, aggression, and hate. At the end of it all, he foresaw the prolongation of human life "beyond any limits which we are able to assign." In their approach to imagining the future, some contemporary partisans of unrestricted biotechnology clearly echo Godwin's prophecy of progress.

But these are extremists, and such views are most certainly the rare exception even among libertarian futurists today. At the conceptual level, of course, what is revealed at the extremes of any movement can often teach us something about what is buried in the center. But it can teach us only so much, and the radical voices at the edges should not be taken to speak for the partisans of innovation more generally.

Most friends of innovation are not such outright champions of a post-human age. Their inclination to utopianism far more often consists of an inchoate readiness to contemplate a radical reworking of the human condition as one potential option for the future. This inclination may demonstrate a lack of moderation, and a willingness (if not an eagerness) to see the future unmoored from the past and the present. These are alarming indications, but in themselves they do not mean that the anthropology of innovation is somehow simply fanatical, or even wrong.

The Missing Link

The second flaw in this vision of the future does, however, pose a significant problem. Put simply, those who imagine the future in terms of innovation tend to think of the future as something that will happen to *us*, and so as something to be judged and understood in terms of the interests of the free, rational, individual adult now living. That person is the basic unit of measurement in all of the theories of social life that inform the anthropology of innovation: the freely choosing individual of classic liberal democratic theory; the rational actor of free market capitalism; the consenting adult of libertarian cultural theories. All of these models and theories serve us well because enough of us do more or less answer that description much of the time.

But the future is populated by other people—people not yet born, who must enter the world and be initiated into the ways of our society, so that they might someday become rational consenting adults themselves. Strangely, what is missing from the view of the future grounded in innovation is the element of time, or at least its human consequent: the passing of generations. What is missing is the child—the actual bearer of the future of humanity—and the peculiar demands, conditions, and possibilities that the presence of children introduces into the life of our society and its future.

In part, children are absent from this vision of the future because the vocabulary of classical liberal and libertarian thinking leaves little room for them. The thought-experiment that is liberalism's creation myth—that famous state of nature from which free and equal men enter together into society and government for the protection of their rights—holds out a timeless ideal. Government is legitimate because free individuals created it by choice and live under its rules in accordance with a kind of contract. But only the founding generation of any society can claim to have done that. The generations that follow did not freely create their regime. They were born into it, literally kicking and screaming. They enter a world formed by laws, arrangements, and institutions that were established by others, but which they have no real choice but to accept. They are also incapable, for about the first two decades of their lives, of fully exercising the rights of citizens. And yet every decision made by their society will directly affect them and those who will follow them. So by the logic of the theory, how can we take into account the needs and rights of future citizens who are not there to consent? How can we keep from treating them unjustly?

Liberal theorists have not been blind to this difficulty of course; and more importantly, like many things that occupy political philosophers, these concerns are really far more of a problem in theory than in practice. The theorists come up with complicated notions of implicit consent and implied participation, while in actual societies liberalism is suspended in the family, and parents are trusted to look out for the interests of their children.

Nonetheless, it matters that the theory of liberal society and the anthropology of innovation have serious trouble with children and with future generations. Our theories do shape our ideals and our actions, and affect our sense of what is legitimate and what is desirable.

The most common answer to the liberal difficulty with the child is to treat children as the charge and almost as the property of parents, and so to apply the language of rights to them second hand. This often makes good sense, but it also has the effect of subsuming the interests of the child within those of the parents, so that in principle our picture of the world can still consist purely of rational adults and their needs and wants. That way, we can continue to imagine the future without considering the distinctive challenges (and the peculiar promise and hope) that result from the presence of children in society.

But the absence of children in this vision of the future results from more than a gap in a theory. Even more important is the very practical way in which children pose a hindrance to any vision of progress. Regardless of how much intellectual and material progress any society may make, every new child entering that society will still enter with essentially the same native intellectual and material equipment as any other child born in any other place at any other time in the history of the human race. Raising such children to the level of their society is, to put it mildly, a distraction from the forward path. And a failure to initiate the next generation of children into the ways of civilization would not only delay or derail innovation, it would put into question the very continuity of that civilization.

The constant intrusion of children into our world reminds us that even as we blaze a trail into the new and unknown we are always at risk of reverting very far back into humanity's barbarous origins, because we are always confronted with new human beings who have just come from there. We are, in a limited sense, always starting from scratch, and this means that we need more than innovation to secure and to better our future.

The anthropology of innovation would like to avoid or avert this complicated reality. It does so mostly by ignoring it, but at the edges of the party of innovation, we see genuine efforts to ward off the challenge of the child. In the "transhumanist" desire for eternal life is a desire to think of the future as belonging to us, and not to future generations. It is a desire to start not from scratch, but from individual, rational, freely choosing adults, and to progress only from there.

Indeed, it may be that in its fullness, this innovation-driven vision of the future almost has to exclude children. William Godwin, the eighteenth-century futurist and prophet of innovations of the human intellect, offers a sense of why that should be. In his future, free of "disease, anguish, melancholy [and] resentment," when people might live nearly forever, progress would almost depend on the absence of children. "The whole will be a people of men, and not of children,"

Godwin writes of his utopian ideal, "generation will not succeed generation, nor truth have, in a certain degree, to recommence her career every thirty years."

This may be the only way in which the anthropology of innovation could be sufficient in itself as a vision of the future. But the fact that truth has, "in a certain degree, to recommence her career every thirty years," or in other words that children enter the world knowing nothing of it, is a defining feature of the life of every human society. Children do not start where their parents left off. They start where their parents started, and where every human being has started, and society must meet them there, and rear them forward. That we are all born this way has everything to do with how the future happens.

Hannah Arendt, borrowing a term from the demographers, labeled this inescapable fact of life human "natality," the counterpart of human mortality. A vision of the future that takes note of our natality will go about imagining in a profoundly different way.

The Anthropology of Generations

To imagine the future in terms of generations means, most fundamentally, to be concerned for continuity. The means of human biological continuity do not offer guarantees of human cultural continuity, because (at least for the time being) the intellectual and cultural progress we might make leaves no real mark on the biology of our descendents. They enter the world as we did, and as all human beings have before us: small, wrinkled, wet, screaming, helpless, and ignorant of just about everything. At this very moment, dozens of people are entering the world in just that condition—about 15,000 worldwide make their entrance every hour—and the future of the human race depends upon them. Contending with this constant onslaught and initiating these newcomers into the ways of our world is the never-ending and momentous challenge that always confronts every society.

At stake are both the achievements of the past and—most especially—the possibilities of the future. If the task of initiation and continuation fails in just one generation, then the chain is broken, the accomplishments of our past are lost and forgotten, and the potential for meaningful progress is forsaken. The barbarism of savage human nature, more than the prospect of a final human victory over natural limitations, is in this sense always just around the corner.

Indeed, what stands out about the anthropology of generations is not so much a desire to protect children from the dangers of the world—a desire shared by nearly everyone—but rather the related determination to protect the world from the dangerous consequences of failing to instruct the up-and-coming generation.

As Hannah Arendt points out in her classic essay on this subject, "The Crisis in Education," the task of education initiates a new child into an old world, and so is responsible for two things: for the child's initiation and for the world's continuation. It is at once responsible for every individual and for the whole society

over time. These two missions are not the same. The child must be protected from the world even as he benefits from its advantages and opportunities. And the world must be protected from the child—from the prospect of savagery—even as it benefits from exposure to the freshness, vitality, and hope of the young. The child is protected in the arms of a family that is in turn strengthened and reinforced by a culture friendly to its cause. And the world is protected through the transmission of culture and civilization.

The very term "culture" already hints at this project. From the Latin *colere*, meaning to tend or to care for (to "*cult*ivate"), culture draws upon an agricultural metaphor that points to the need for the appropriate conditions for growth. The work of the culture is the work of cultivating human souls, providing them with nourishment and with protection as they grow. The culture provides the background preconditions without which a society could not contend with the challenge of natality. This is one main reason why conservatives—to whom the anthropology of generations most appeals—care so much about the culture and its mores.

It is also why some vague and seemingly abstract concerns—like human dignity and human nature—matter so much to conservatives engaged in the biotechnology debates. Such ideas cannot help but shape the way the next generation understands its place and its purpose, and some potential innovations in biotechnology cannot help but affect these ideas. This is why it is critical to think about today's innovations with the future in mind, and to consider their implications for future generations who would enter a world that takes these innovations for granted.

Indeed, this sort of thought-experiment is key to much of the approach of those drawn to the anthropology of generations. When thinking about a world profoundly influenced by some new technology or innovation, they do not ask only "what would it be like to live in that world?" They ask also "what would it be like to enter that world, knowing only that world, growing up in that world, being shaped by that world?" They judge each innovation not only by how it might enhance or degrade their own life, but also by how it might improve or diminish the ability of our society to raise and to tend to the next generation, and by its effect on the inheritance we could leave for the future. They therefore sometimes judge innovations very differently than those who think of the future primarily in terms of the interests of the present.

In fact, this generational approach to the future implies that innovation is not as significant as it may sometimes seem, because the most crucial project of every community remains mostly the same over time. Because the challenge of initiation and continuation is absolutely critical to the survival of every society, the most important thing that any society is likely to be doing at any given moment is educating and rearing the next generation. This is the most important thing

human beings did in the past, the most important thing we now do in the present, and the most important thing the human race will need to do in the future. It is obviously not the only thing we do, but it is the essential prerequisite to anything else we might want to do, emphatically including innovation and progress.

The necessary tools for this critical ongoing mission—families, communities, institutions, and cultures that encourage transmission and initiation—are therefore permanently necessary, and are generally more important than almost anything else we might imagine when we think about the future. These need to be defended and encouraged, because it is very difficult to conceive of a future without them.

Other important projects we engage in, as individuals and as societies, can be judged in part in terms of their effects on this imperative goal of perpetuation and transmission. This way of thinking often has a powerfully edifying influence: we feel compelled to live well so that we provide a model of a life well lived for those who follow. But even when it cannot claim this benefit, this way of thinking keeps us alert to the genuine needs of the future. If some approaches to progress undercut the prerequisites for further progress, they must be understood and judged as such.

This might occur when certain potential innovations stand to meaningfully undermine our ability to pass along to future generations the ideals, the virtues, the knowledge, the traditions, the living spirit of our society—that is, when innovation stands to alter something so profound about the human experience that the inheritance of the future would be significantly diminished as a result of its loss. These are the sorts of dangers that conservatives in the biotechnology debates are eager to repel.

This eagerness and this worldview, however, are open to two very serious drawbacks, which conservatives are not always sufficiently ready to admit or resist. The first is an exaggeration of the threats to childhood and to future generations, and an excessively protective stance that threatens to turn politics into a branch of pediatrics. The impulse to protect children from exposure to the larger world threatens to suffocate them (and us) if it is not tied to an effort to also initiate and expose them to that world. It is easy to go overboard in childproofing our culture, and it is easy to underestimate the ability of children to contend with and to process cultural influences. Some threats to transmission and to childhood are very real—and some biotechnologies, which reach children at a primal biological level, may pose such threats—but we should not go too far in estimating the vulnerability of the next generation.

The second drawback is a tendency to confuse the project of transmission with that of preservation. This is the conservative version of the utopian impulse. It begins from a tendency to idealize the past, and falls into a self-caricaturing blind nostalgia, and into simpleminded "when I was a kid" modes of

argument. These can be found at the edges of the party of transmission, just as the post-humanists lurk at the edges of the party of innovation. These conservative extremists are no less misguided than their libertarian counterparts, and no less guilty of missing the point.

The lesson of the anthropology of generations is not so much that the past should be preserved, or even that change should somehow be governed in its every detail. That is not only impossible but thoroughly undesirable. Rather, the point is to recognize that a set of several very basic things—centered especially on the rearing and education of the young—must be allowed to happen in the future. These can be aided and improved by many human innovations, and left mostly untouched by others. But they might also be significantly undermined or made impossible by certain sorts of innovations, and these must be avoided when they can be. Trial and error alone cannot always be trusted to discern the difference, because the costs of error are too great.

But how, then, can we discern the difference? How do we tell genuinely dangerous prospects apart from merely startling novelties? The costs of erring too far on the side of caution can be very high, especially when innovations in medicine may be at stake. What does the anthropology of generations suggest that we should truly be concerned about in the fast-approaching age of biotechnology? Two examples will begin to gesture toward an answer.

Closing off the Future

Perhaps the most significant consequence of human biotechnology for the project of transmission and perpetuation is the potential, for the first time in human history, to directly manipulate the raw material of the next generation: to alter and control the biology of our descendents in advance. As the scientific journal *Nature* noted in an editorial following the cloning of Dolly the sheep: "The growing power of molecular genetics confronts us with future prospects of being able to change the nature of our species."

The most fundamental fact of human natality has always been that human nature emerges from the womb in essentially the same general form in every generation; or, as conservatives like to put it, that human nature has no history. The implications of this insight can hardly be overstated. It sits at the core of the conservative understanding of human life and society. It is the reason that those social and political arrangements that have passed the test of time are worth preserving—because the "test of time" is really just a nearly constant repetition (in changing circumstances) of the challenge of promoting human virtues and satisfying human wants in the face of some permanent facts about human beings. It is the reason that new ideas too must be tested against the hard realities of human nature, and, for this reason, it is also the principal solvent of utopian fantasy and totalitarian ambition. The Marxist dream of a "new man" free of the old

attachments and desires ran head-on into the permanence of the old man's nature, and was forced to succumb like so many wicked fantasies before it. Human aims and innovations have always had to comport themselves with human nature, and this has generally worked as an effective moderator of otherwise reckless projects.

But what if human nature could instead be made to comport with human aims and innovations? What if rather than reshaping the world to suit man's nature, technology was turned to reshaping that nature—to reshaping man himself? The reeducation camps of twentieth century totalitarianisms were ineffective (not to mention horrendously inhumane) attempts to do just that. Could biotechnology offer a more effective and more compassionate means? The answer is maybe, and it depends.

It seems unlikely that biotechnology will ever simply allow us to control or to program the psyche of the unborn. But through a combination of some foreseeable advances in genetics, neuroscience, embryo research, and assisted reproduction, along with techniques of screening, selection, and crude manipulation, we could at least come to select our descendents based upon a probability of their possessing characteristics (including some of personality and mind) we find desirable. Technologies developed to screen out disease very easily become available to screen out other traits, and the capacity for manipulation and engineering will likely grow more plausible with time. As we learn more about the underlying causes of aggression, or melancholy, or cognitive ability, or even artistic or musical skill, among countless other traits, we will be better able to screen for these traits in both the genotype and the early phenotype of embryos, fetuses, and children, and perhaps someday be able to design and engineer them in as well.

This new power would carry with it some grave consequences and some heavy burdens of responsibility. We would be responsible for the character of the next generation (and perhaps all future generations) in a way we never could have been before, and at the same time, by plying our influence at the level of biology rather than moral education, we might grossly restrict the liberty of our descendents.

It is very likely true, as the innovationists would remind us, that parents would only choose what they understand to be best for their children. Parents always have. But this point misses the nature and scale of this new technological power. Our sense of what is good and bad for our children is built upon a moral vision of human life that was grounded in the old ways: in response to human nature, and in the expectation of the permanence of that nature. And our ability to act on that sense has always been restrained by the stubbornness of the traits children somehow already possess. In a world of positive control, both of these constraints would be profoundly altered. The edifying limits on the parent's power—and with them the very newness of the child—would be diminished.

That newness would diminish because the next generation, and those that come after, would be less and less surprising to us, and more and more a product of our plans and purposes. As Hannah Arendt put it, in the context of education:

> Our hope always hangs on the new which every generation brings; but precisely because we can base our hope only on this, we destroy everything if we so try to control the new that we, the old, can dictate how it will look. Exactly for the sake of what is new and revolutionary in every child, education must be conservative; it must preserve this newness and introduce it as a new thing into an old world.

Rather than new people in an old world, the generations designed by our biotechnology would increasingly be familiar people—made to suit our preferences—in a new and unfamiliar sort of world, a world unhinged from the limits that defined the past, and so unlikely to bring forth the surprises that define the future: a world living always in this present. The innovationist ideal becomes a self-fulfilling prophecy.

We would also find ourselves stuck with the consequences of present ideas and fads, imprinted permanently in the biology of our descendents. In almost every age, someone has proposed some clever and terrible scheme for how children should be reared and raised. The West's first great philosopher suggested that children should be separated from mothers and fathers, and raised in common by what amounts to a bureau of parenting, and the world has since seen no shortage of similarly bright ideas. Misguided educational fads have done real damage now and then, but they have generally not gone very far, because some traditional practices grounded in natural attachments seem to accord best with the character of parents and children. Such practices have resisted every effort at radical reform. But direct interventions in children's bodies and minds, and particularly genetic interventions or selections that may extend to further generations beyond, would make permanent the preferences of the present, and would subject future generations to our whims. It has been very good for us that the raw material of humanity remains raw in every generation.

By imagining the future in terms of generations we can also see how the imposition of parental preferences, even advantageous ones, could constrain a child's sense of personal liberty and potential. Imagining the future child rationally analyzing neutral facts, *Reason* magazine's Ronald Bailey has written that "the designer babies of the future will have more knowledge and therefore will have a far greater scope for free choice than we do today." But freedom is not just another word for nothing left to know. One's sense of independence would certainly be hampered by the knowledge that one's intellectual faculties or biological features were made to order or chosen off the shelf. Think of what it would be like to enter the world as a person with physical or mental traits selected in advance, and to grow and get to know oneself as such a person. Think of what

it would mean to know that your parents chose you or designed you to possess certain qualities, to affect certain traits, to be some particular way.

Not only the knowledge of *which* traits you were chosen to have, but even simply the knowledge that you are as you are because your parents expected something in particular out of you, would be certain to constrain your sense of possibility and independence. It is far from clear if such a child would indeed "have more knowledge" about his or her humanity, or would feel a greater sense of freedom than the countless generations who have spent their lives discovering and revealing their potential.

In purely biological terms, the trait-selected child would still have an unknown potential, because we are not likely to develop anything approaching absolute control of the biology of our descendents. But in terms of the human experience of life, that child, unlike any of us, would live always shadowed by the presence of parental will expressed in his or her own biology. The issue is not some genetic determinism, but rather the concern that the knowledge of having been designed by another for a particular purpose—of being, in a fundamental material sense, what someone else decided he or she should be—would diminish a child's sense of freedom and possibility. We know what can happen when children are pushed too hard to live out parental expectations and wishes. If that push exerted itself in the child's very biology, its effect (even if only implicit and emotional) would be despotic in the extreme.

And what of that child's own children and grandchildren? This diminution of freedom would intensify as its effects reverberated through the generations. C. S. Lewis understood this consequence of our increasing power over man in 1944, even if he did not foresee the precise technological means of achieving it. In *The Abolition of Man*, Lewis wrote:

> A picture is sometimes painted of a progressive emancipation from tradition and a progressive control of natural processes resulting in a continual increase of human power. In reality, of course, if any one age really attains, by eugenics and scientific education, the power to make its descendents what it pleases, all men who live after it are the patients of that power. They are weaker, not stronger: for though we may have put wonderful machines in their hands we have pre-ordained how they are to use them.… The real picture is that of one dominant age—let us suppose the hundredth century A.D.—which resists all previous ages most successfully and dominates all subsequent ages most irresistibly, and thus is the real master of the human species.

It is no surprise that the present-centered anthropology of innovation, which seeks to ignore the critical task of transmitting our cultural inheritance to the future, has also taken it upon itself to stop the endlessly reiterating procession of generations, and to take in hand the biology of our descendents, turning the future into an unlimited extension of the present. If the future must be populat-

ed by other people, say the innovationists, let them at least not start from biological scratch. And yet, by unmooring human nature from its permanent foundations—foundations that have been the sources of our social, cultural, and political institutions—this project would indeed start future generations from scratch in a more profound and decisive way.

This is one way in which biotechnology directed to the human person has the potential to dramatically disrupt the all-important process of transmission, and one reason why those informed by the anthropology of generations worry about it. Engineering human biological change is, in these terms, a very different matter from engineering animals and plants to better serve our needs. It changes "us" to better serve us. And once it has done so, we are cut off from the roots of all other movements for change and improvement. The modern age and the scientific revolution have sought, with great success, to better fit the world to man. But by altering man himself, we now seek to better suit mankind to … what? Only to the short-term wishes of the present. Imagining the future in terms of generations helps us see how terribly shortsighted such a project is likely to be, and how disruptive of the critical mission of bringing up future generations it is almost certain to be.

Human Dignity and the Culture

The mission of managing the junction of the generations relies, as we have seen, not only on the work of individual parents or teachers, but also on some shared sense of the character and significance of a full and dignified human life, and on a culture that supports and builds that sense. The way we understand ourselves obviously shapes the way we introduce ourselves to the next generation, both the lessons we give and the examples we offer.

In the biotech debates, this is why conservatives defend large and often fairly vague ideas of human dignity, human limits, and human excellence. For many conservatives, the argument about biotechnology is an argument about the future of our idea of humanity. That idea shapes human ideals and aspirations, in this generation and in future ones; it is the substance of what we stand to teach the future.

In subtle but absolutely critical ways, the biotechnology revolution is likely to impinge on this self-image of humanity, and in doing so to affect the assumptions and intuitions of future generations entering a world reshaped. By changing the way they regard their humanity, it will affect the way they live it out and pass it on.

Our ability to reorder and transform some prime ingredients of the human experience—our desires, our bodily selves, the relation of our actions and our happiness—requires us to think in a new way about the meaning of our innovations for the future. Changes in the relations between parents and children,

between effort and performance, between body and soul, could hardly help but influence humanity's understanding of itself and so our very sense of what a human life entails. The question is whether these changes will diminish or enhance the lives lived under their influence.

We should not pretend to have a simple answer to that question. But here again, it is crucial to see things through the eyes of a new generation entering the world we are constructing, and growing up knowing no other. To grow up in a world where personality and behavior are subject to carefully targeted scientific control, where physical performance and mental acuity are routinely enhanced by drugs, where procreation is a laboratory procedure, where the human animal is primarily understood as a chemical machine to be manipulated by a rational controller, is to develop in a very different place than that which has built up our idea of human life and human aspiration until now. It is to mature, and to build the capacity to reason and intuit, in an unfamiliar universe of concepts, where the basics of human being, acting, and feeling in the world stand profoundly altered. No one can know exactly what these changes will mean. But we also cannot simply expect that a rational, humane, or noble choice will mean the same thing to a person who has grown up in such a place, with such a sense of self, as it now does to us. Diminished concepts of human activity, human relations, and human dignity might affect the present generation only mildly, indeed perhaps only theoretically. But the effects on our ability to introduce ourselves to future generations who would grow up knowing no other way would be far more significant.

This worry is painfully vague and notoriously difficult to translate into the language of liberal-democratic politics, but it is no less real for being so. It lays at the bottom of a great deal of the general disquiet regarding the age of biotechnology. Rendering it into recognizable social and political arguments is a key challenge for any future conservative bioethics. The language of human dignity begins to point in this direction, and conservatives in the coming years will need to work to make that language more concrete and to understand its implications.

Imagining the Future

These general reflections do not by any means simply add up to arguments for stopping the progress of biotechnology, and the concerns they raise do not simply outweigh the great promise of many biotechnologies. But they do add up to an argument for thinking about the future in terms of those who will actually live there—in terms of future generations.

Thinking in these terms reminds us of the heavy burden of responsibility we bear, as a generation confronting the biotechnology revolution at its outset. Our new and growing power to affect the future of humanity requires a new reflection on ethical principles. As Hans Jonas understood, our unprecedented ability

to affect the nature and the character of future generations means that *responsibility* must be the center of this new ethical approach, in a way that it has never had to be before. This responsibility demands that we think hard about the future, that we think of it in the proper terms, and that we now and then temper our hope with caution.

As always, our ability to affect the future is far greater than our ability to know the future. But we do not need to know what is coming—or even to know what we want the future to bring—in order to know what we should hope to avoid. As Jonas put it three decades ago, "what we must avoid at all costs is determined by what we must preserve at all costs." Of course, it is also not always easy to know what we must preserve—what is crucially in need of defense and what, on the other hand, could be profitably traded for an improvement in our health, power, or wealth (or those of future generations). But one thing we surely must preserve, one thing we will certainly need regardless of what the future holds, is the capacity to rear and to educate future generations. The quest for improvement and innovation is a force for great good, but it must not destroy the preconditions for its own efforts—the preconditions for the future.

To think of the future requires imagination; and to think of generations entering the world of the future requires a tremendous feat of imagination. In a strange way, it is precisely the most eager futurists in our contemporary politics who seem to lack the capacity for such feats of imagination, who see only themselves in the future, and fail to take account of the need to bring up those who will travel there, and those who will be born along the way. Responsible futurism requires that we imagine a world without us in it, and that we care about it. If the only way we can bring ourselves to care about the future is to make sure that we live forever, then we have little hope of doing the future much good.

The needs of future generations, just like those of past and present ones, extend beyond health, and wealth, and comfort. If they are to live well, and to raise those who follow them to live well, they must aspire to greater things. Life, liberty, and the pursuit of happiness are the minimal standards for decent living, not the highest ends of man. They are critical, but we cannot rest satisfied with them. We need larger aims, and the future will too.

Imagining the future through the lens of innovation leads us to believe that the most important challenge we will face in the future is steadily improving the material conditions of human life by steadily improving upon human understanding and power. Meeting that challenge requires individual freedom to innovate, and this must not be constrained for the sake of vague concerns about unpredictable consequences. But imagining the future through the lens of generations leads us to believe that the most important challenge we will face in the future is also the most important challenge we face today and have always faced in the past: the challenge of bringing up those who are new to the world. That

challenge requires some basic prerequisites that must not be innovated out of existence.

The difficulty is that both lenses show us something true about the future, and both also put us at risk of mistaking the present for the future—either by failing to imagine progress, or by failing to imagine a world without ourselves in it. We are left to decide how to balance the lessons of these two competing anthropologies, for our sake and for the sake of the future. Our ongoing debates over biotechnology are an effort to seek just that balance, far more than they are really arguments about particular technologies.

Of the two competing visions, the anthropology of generations offers us a fuller and more recognizable account of the truth of the human condition. But it surely is not simply right, and if we are to secure the preconditions for progress, we must remember that we do this because progress is good for us and important, and not because we simply wish to preserve the world we have known. We must be careful, in tending our intuitions and hopes, to weed out simple reactionism, and to avoid the misguided desire for a wholesale recovery of the past. The past was not as good as we think we remember it was.

Instead, what we risk losing, and what we might want to recover, is something more like the past's way of thinking about the future. One of the most monumental innovations of the modern age—in science and society alike—has been a way of thinking about the future that ignores, and so leaves little room for, the future generations who will have to live with the consequences of our actions. This is one innovation we will have to resist in order to make truly responsible progress possible. The recovery of an older way of imagining the future need not be reactionary. It is not about pining for the past as much as it is about admiring the future made for us by those who came before, and seeking to build one no less admirable for those who will come after.

Keeping in mind the burdens and blessings of natality and the peculiar responsibility that the present always has for the future offers the only way for us to make moral sense of the new possibilities opened up by the age of biotechnology. If we can do it well, we will be better able not only to preserve our moral tradition and to confer to our children an implicit sense of human dignity and human excellence, but also to preserve the preconditions for liberal and libertarian virtues and freedoms. We will be better able to fill the tall order that still echoes in our memories in the voices of our nation's founders: to secure the blessings of liberty to ourselves and our posterity.