

THE ILLIBERALITY OF ‘LIBERAL EUGENICS’

Dov Fox

Abstract

This essay evaluates the moral logic of ‘liberal eugenics’: the ideal of genetic control which leaves decisions about what sort of people to produce in the hands of individual parents, absent government intervention. I argue that liberal eugenics cannot be justified on the basis of the underlying liberal theory which inspires it. I introduce an alternative to Rawls’s social primary goods that might be called natural primary goods: heritable mental and physical capacities and dispositions that are valued across a range of projects and pursuits. I suggest that reproductive genetic biotechnologies like embryo selection, cellular surgery, and genetic engineering, which aim to enhance ‘general purpose’ traits in offspring are less like childrearing practices a liberal government leaves to the discretion of parents than like practices the state makes compulsory. I argue that if the liberal commitment to autonomy is important enough for the state to mandate childrearing practices such as health care and basic education, that very same interest is important enough for the state to mandate safe, effective, and functionally integrated genetic practices that act on analogous all-purpose traits such as resistance to disease and general cognitive functioning. I conclude that the liberal case for compulsory eugenics is a *reductio* against liberal theory.

Eugenics in the liberal imagination

‘Recent advances in the understanding of human heredity offered by the new genetics,’ reveals Nicholas Agar, ‘have prompted a revival in eugenics.’¹ ‘Eugenics’ is the attempt to apply to procreation knowledge of hereditary processes for the purpose of producing offspring for particular characteristics. Despite its monstrous history and menacing connotations, ‘eugenics’ has been reclaimed by an emerging school of liberal philosophers who

¹ Nicholas Agar, ‘Liberal Eugenics,’ *Public Affairs Quarterly*, vol. 12, no. 2 (1998), pp. 137–153, 137.

argue that we can separate an innocuous core from the hateful motives and violent methods with which the ideal has been carried out. Hitler gave eugenics a bad name, these liberals insist, but there is nothing objectionable as such about the eugenic ambition to produce people of a particular type. Adding “the word ‘liberal’ to ‘eugenics,’ Agar affirms, ‘transforms an evil doctrine into a morally acceptable one.’”²

Liberal eugenics defined

In describing what I mean by ‘liberal’ eugenics, I should begin by saying what liberal eugenics is not. Liberal eugenics is not the eugenic ideal popular in early twentieth century America and Britain which emphasized progressive-minded procreative responsibility as a solution to social problems ranging from disease, degeneracy, and feeble-mindedness to criminality, pauperism, and alcoholism.³ This ‘progressive’ eugenics was championed by academics and policymakers across the ideological spectrum, including liberal Democrat Woodrow Wilson, conservative Republican Calvin Coolidge, and progressive Republican Theodore Roosevelt, but it is not the ideal of eugenics I have in mind.

The ‘liberal eugenics’ I examine here is instead an ideal of genetic control which leaves decisions about what kinds of people to produce in the hands of parents, absent government intervention. This free-market programme of selective procreation permits ‘anyone who wishes, for whatever reason, to offer genetic services to anyone who wants them and is willing to accept them on the terms on which they are offered.’⁴ Liberal eugenics departs from progressive eugenics in transferring the reins of genetic control from state ideology to parental choice.

The *term* liberal eugenics has come to prominence only recently, in a 1998 article and 2004 book of that name by Nicholas

² Agar, *Liberal Eugenics: In Defense of Human Enhancement* (Oxford: Blackwell, 2004), p. 135.

³ Michael Freeden, ‘Eugenics and Progressive Thought: A Study in Ideological Affinity,’ *The Historical Journal*, vol. 22, no. 3 (1979), pp. 645–671, 653–657.

⁴ Peter Singer, ‘Shopping at the Genetic Supermarket,’ in Song, Sang-Yong, et al. (eds.), *Asian Bioethics in the 21st Century* (Tsukuba, Japan: University of Tsukuba Publishing, 2003), pp. 143–156, 145.

Agar,⁵ but the *ideal* of liberal eugenics – that parents should be free to choose the DNA of their children-to-be – has been developed and endorsed in full-length volumes by scholars as early as 1974, including Joseph Fletcher,⁶ John Harris,⁷ Philip Kitcher,⁸ Glenn McGee,⁹ Ramez Naam,¹⁰ Gregory Pence,¹¹ John Robertson,¹² Lee Silver,¹³ Gregory Stock,¹⁴ and Peter Sloterdijk.¹⁵ While few of its proponents call 'liberal eugenics' by that name, each endorses the central claim that it is morally permissible for parents to choose the hereditary factors contributing to the development of particular traits in their offspring, whether selecting *for* characteristics thought to be desirable, or *against* characteristics deemed undesirable. Despite the central theoretical presuppositions common to this literature on liberal eugenics, it has not to this point been considered *en bloc*.

Liberal eugenics bears three defining features. The ideal prescribes that decisions touching on reproductive selection should be: (1) voluntary, (2) individualistic, and (3) state-neutral. First, decisions concerning offspring biology should be *voluntary* in the sense that they are made free of coercion. Whereas the eugenics of old often relied on sexual segregation, miscegenation laws, and forced sterilization, liberal eugenics is given by elective decisions made under no formal constraints. Second, eugenic choices should be *individualistic*, and in two senses: first, they should be made *by* individual families rather than government officials or

⁵ Agar, 'Liberal Eugenics,' and *Liberal Eugenics*.

⁶ Joseph Fletcher, *The Ethics of Genetic Control: Ending Reproductive Roulette* (New York: Anchor Books, 1974), esp. pp. 147–187.

⁷ John Harris, *Wonderwoman and Superman: The Ethics of Human Biotechnology* (Oxford: Oxford University Press, 1992), esp. pp. 158–161, 168–175.

⁸ Philip Kitcher, *The Lives to Come: The Genetic Revolution and Human Possibilities* (New York: Simon and Schuster, 1996), esp. pp. 187–204.

⁹ Glenn McGee, *The Perfect Baby: Parenthood in the New World of Cloning and Genetics* (New York: Rowman & Littlefield, 2000), esp. pp. 125–140.

¹⁰ Ramez Naam, *More Than Human: Embracing the Promise of Biological Enhancement* (New York: Broadway Books, 2005), pp. 6–7, 27–31, 67–71, 134–138.

¹¹ Gregory E. Pence, *Who's Afraid of Human Cloning?* (New York: Rowman & Littlefield, 1998), esp. pp. 168–180.

¹² John A. Robertson, *Children of Choice: Freedom and the New Reproductive Technologies* (Princeton, NJ: Princeton University Press, 1994), esp. pp. 149–172.

¹³ Lee M. Silver, *Remaking Eden: How Genetic Engineering and Cloning Will Transform the American Family* (New York: Avon Books, 1998), esp. pp. 166–180.

¹⁴ Gregory Stock, *Redesigning Humans: Our Inevitable Genetic Future* (Boston: Houghton Mifflin, 2002), esp. pp. 197–201.

¹⁵ Peter Sloterdijk, *Rules for the Human Park* (Frankfurt am Main: Suhrkamp Verlag, 1999), esp. pp. 10–13, 25–29, 48–55.

relevant experts, and second, they should be made *for* individual offspring rather than for gene pools of broader groups. The ‘genetic supermarket’ made possible by liberal eugenics ‘has the great virtue,’ Nozick writes, ‘that it involves no centralized decision fixing the futures of human type(s).’¹⁶ The third feature of liberal eugenics is that decisions about genetic control be *state-neutral*, insofar that government does not promote any particular blueprint for what sorts of people there should be, leaving parents free to enhance their offspring as they see fit. ‘While old-fashioned authoritarian eugenicists sought to produce citizens out of a single centrally designed mould,’ writes Agar, ‘the distinguishing mark of the new liberal eugenics is state neutrality.’¹⁷

Liberal eugenics justified

Exponents of liberal eugenics defend the ideal in two ways: first, as an extension of basic reproductive liberty; and second, *per analogiam* to childrearing practices we commonly accept. The first justification is that practices aiming at hereditary design are protected by a ‘procreative liberty,’ which restricts the reach of state power into parents’ decisions about the number, timing, spacing, and quality of their offspring.¹⁸ Whereas such procreative liberty has historically been invoked as a negative right to prevent conception or birth, liberal eugenicists today appeal to that freedom as a positive right to undertake available measures to have a child of a particular type. Because reproductive decisions impinge so profoundly on one’s body, identity, and sense of meaning, they argue, the government should entrust to individual parents exclusive control over the reproductive sphere, including decisions about genetic selection, provided that parents can pay the cost of those decisions, which cannot reasonably be expected to cause substantial harm to the material interests of identifiable others.¹⁹ ‘If women are allowed the ‘reproductive right’ or ‘choice’ to

¹⁶ Robert Nozick, *Anarchy, State, and Utopia* (New York: Basic Books, 1974), p. 315 (footnote).

¹⁷ Agar, ‘Liberal Eugenics,’ p. 137.

¹⁸ Robertson, p. 16.

¹⁹ Ronald Dworkin, *Life’s Dominion: An Argument About Abortion, Euthanasia, and Individual Freedom* (New York: Vintage Books, 1994), p. 158; Dan W. Brock, ‘Shaping Future Children: Parental Rights and Societal Interests,’ *The Journal of Political Philosophy*, vol. 13, no. 4 (2005), pp. 377–398, 381.

choose the father of their child, with his attendant characteristics," James Hughes confirms, "then they should be allowed the right to choose the characteristics from a catalog."²⁰

The second justification for liberal eugenics draws on a moral similarity between the futuristic and the familiar. If there is nothing wrong with parental attempts to mold offspring characteristics using age-old means like praise and blame, liberal eugenicists argue, why worry about like-minded attempts that enlist novel genetic means? Whatever the method, after all, any practice that aims to enhance the traits of progeny pursues the same goal of better children. What is the difference, morally speaking, between genetically engineering offspring for the skills required for success in, say, football or the saxophone, and guiding a child's life to excel in that pursuit through the use of special training and instruction? Some might object to genetic intervention on grounds of scientific uncertainty about medical risks such procedures might occasion to pregnant women or their offspring. But empirical anxieties about safety, efficacy, and precision present tangential or transitory objections which may be dismissed with scientific advances over time or assumed away to hone in on the more pressing philosophical issues at stake. Since we give parents extensive freedom to shape their kids through conventional child-rearing practices, liberal eugenicists ask, what reason have we not to give them the same freedom over high-tech genetic machinery?²¹

Rethinking the analogy

Liberal eugenicists do well to dispel misguided distinctions between nature and nurture, such as the idea that we can go back and undo environmental influences, while genetic influences are permanent. Children are not born with some fixed potential from within which parental choices simply 'bring out the best.' Complex traits like intelligence, musicality, and athletic prowess are instead embedded and developed through a robust interplay

²⁰ James Hughes, 'Embracing Change with All Four Arms,' *Eubios Journal of Asian and International Bioethics*, vol. 6, no. 4 (1996), pp. 94–101, 99.

²¹ See for example: Agar, *Liberal Eugenics*, p. 113; Jonathan Glover, *What Sort of People Should There Be? Genetic Engineering, Brain Control, and Their Impact on Our Future World* (New York, Penguin Books, 1984), p. 53; Silver, p. 277; Robertson, p. 167.

of heredity and environment. Biotechnologies that modify offspring's DNA need not therefore result in a child who is an essentially different person – take embryo selection for eye color; and traditional practices that change a child's environment need not limit their reach to non-fundamental characteristics of an individual who is essentially the same – take early socialization for the development of cognitive and emotional capabilities.²² Even if genetic and environmental influences *could* be distinguished on the basis of reversibility, this difference would not in itself prove decisive. For the moral status of childrearing practices depends at least in part on what *sorts* of traits it is parents aim to promote. 'In bringing up our children, we try to encourage kindness and generosity,' notes Jonathan Glover. 'Would we really stop doing this if we were so effective that cruelty and meanness became impossible for them?'²³

Nor may genetic interventions be distinguished from non-genetic ones by appeal to the rights of pregnant women to do with their bodies as they choose. Leading geneticists predict that the insertion of genetic material into human cells of future offspring would be effective primarily on gametes prior to fertilization or on embryos prior to implantation, as opposed to on fetuses or on persons after birth. If prenatal enhancements on fetuses did become possible, it would far less likely be by means of invasive procedures such as *in utero* gene surgery than by externally administered treatments such as tablets taken early in pregnancy or supplements added to drinking water or staple foods. Since liberal societies already exercise special sanctions against pregnant women who take drugs known to harm the fetus,²⁴ and already require that food manufacturers add folic acid to grain products like pastas and cereals to reduce the risk of neural tube defects in newborns;²⁵ genetic practices need not raise special concerns involving female rights of bodily integrity or the treatment of women as mere vessels for the most desirable children medical science can produce.

²² Allen Buchanan, Dan W. Brock, Norman Daniels, and Daniel Wikler, *From Chance to Choice* (Cambridge: Cambridge University Press, 2000), p. 160.

²³ Glover, p. 53.

²⁴ See *Whitner v. State of South Carolina*, 492 S.E.2d 777 (1997).

²⁵ U.S. Food and Drug Administration, 'Food Standards: Amendment of Standards of Identity for Enriched Grain Products to Require Addition of Folic Acid.' 61 *Federal Register* (1996), pp. 8781–8797.

Liberal eugenicists are right to note the moral resemblance between reproductive genetic technologies and commonly accepted childrearing practices. Where they go wrong is in failing to recognise that a society guided by liberal philosophy does not leave all childrearing practices to parental discretion. Some childrearing practices, like abuse and neglect, are forbidden. And other practices, like health care and basic education, are compulsory. It stands to ask whether genetic engineering is, as liberal eugenicists claim, similar to practices the liberals leave to the private decision-making of parents, or whether it is instead more like practices liberals prohibit or mandate by force of law.²⁶

Liberalism and the commitment to autonomy

The liberalism from which liberal eugenics derives its namesake and inspiration sustains a mildly perfectionist commitment to the value of autonomy. By 'liberalism,' I mean the political ideology which affirms equal respect for persons as free and independent selves, capable of choosing their own values and ends, consistent with a similar liberty for others. By 'autonomy,' I mean the capacity of the individual to make genuine choices among a meaningful range of life plans. I take a 'life plan' to be not an exhaustive list detailing one's goals at various points in the future, but rather a rough narrative of one's life over time, wrought by critical reflection on one's aims, attachments, and aspirations by reference to the type of person one wishes for oneself to be. A 'meaningful' range of life plans is one that provides a reasonable number and diversity of viable life plans from which people may choose. Autonomy so understood admits of gradations. Individuals who pursue a life in politics or a monastery may both on this account be in varying degrees autonomous, so long as each has non-arbitrary reasons to prefer the option she has chosen over those she has not.

There are three reasons why autonomy is a constitutive good for liberals. First, leaving individuals free to pursue their life plans for themselves gives the best chance they will collectively develop the variety of projects and pursuits vital to the flourishing of a society characterised by moral diversity and value pluralism. A

²⁶ I owe this insight to David Grewal.

proliferation of ‘experiments in life’ follows naturally from a climate of free development, which sustains the shared capacity of individuals to choose for themselves how they wish to live.²⁷ The second reason for liberalism’s commitment to autonomy connects free choice to the ideal of individual agency. Even if additional options yield none that is better than the first, the very *having* of multiple life plans from among which to select or reject enables the individual more fully to achieve an intentional efficacy about that part of the world relating to her life.²⁸ Third, for a way of life to have value for an individual, the individual must choose that life for herself, in accordance with what she believes gives that life worth and meaning, rather than simply going through the motions out of deference to coercion, manipulation, or lack of options.²⁹

Paternalism and primary education

The liberal commitment to autonomy is what gives justificatory force to the practice of compulsory education in societies which affirm the primacy of equal individual freedom in political arrangements. State action that restricts the freedom of competent individuals ‘for their own good’ encroaches without warrant upon their autonomy, even if some of the pursuits people undertake – bungee jumping or chasing leprechauns – are demonstrably dangerous or foolish. Paternalism is justified if and only if two conditions hold: first, the individual for whom the good is intended is not at the relevant time capable of free choice; and second, it can be reasonably expected, on the basis of evidence about the individual’s particular motivations and objectives, that she would upon regaining autonomy be grateful for the state having under the circumstances so acted on her behalf.³⁰ Appropriate ascription of hypothetical consent validates paternalistic action toward certain adults – the unconscious, comatose, or mentally deficient – in those spheres of life in which they are not competent to make decisions for themselves.

²⁷ John Stuart Mill, *On Liberty* (London: J.M. Dent, 1972), pp. 128–129.

²⁸ Thomas Hurka, ‘Why Value Autonomy,’ *Social Theory and Practice*, vol. 13, no. 3 (1987), pp. 361–382, 375.

²⁹ Mill, p. 117.

³⁰ See Brock, ‘Paternalism and Autonomy,’ *Ethics*, vol. 98, no. 1 (1988), pp. 550–565.

Children, however, find themselves in a predictable and extended state of *dementia praecox*, during which they lack those 'settled preferences and interests' essential for a discernible, independent framework to guide action taken on their behalves.³¹ Yet liberal states still practice wide-ranging paternalism toward children. Not only does the state deny children liberties – of speech, religion, association, privacy, democratic participation, and property ownership – that are routinely granted to adults; it also subjects them to compulsory measures – vaccinations and immunizations, dental visits, and primary schooling – from which adults are exempt.

Two conditions justify paternalism toward children: first, the age-sensitive presumption regarding possession of the 'faculty' of autonomy; and second, recognition of non-state obstacles to the 'facility' of autonomy. What might be called the 'faculty' of autonomy is a precondition of the 'facility' of autonomy. The 'facility' of autonomy is what I described earlier simply as 'autonomy': the individual's capacity to choose among a meaningful range of life plans, free of coercion or deprivation. Recall that the facility of autonomy amounts to the possession of resources given by *external* resources – non-coercion, non-manipulation, shelter, and income – which are required for the choice of life plans to be truly free. The 'faculty' of autonomy, by contrast, is the bundle of personal abilities that makes the capacity for choice possible in the first place. The faculty of autonomy is given by *internal* resources – knowledge, experience, emotional independence, and critical reasoning skills – which provide the requisite accoutrements for choice to come about in the first place.³²

Only if an individual has the *faculty* of autonomy is she capable of enjoying the *facility* of autonomy. But children do not ordinarily possess the faculty of autonomy.³³ So they cannot be said to possess the facility of autonomy, which must be in place if autonomy is to be violated, and claims of unreasonable paternal-

³¹ John Rawls, *A Theory of Justice* (Cambridge, MA: Harvard University Press, 1999), pp. 217–219.

³² Martha Nussbaum makes a similar distinction between internal and external capabilities in her *Women and Human Development: The Capabilities Approach* (Cambridge, Cambridge University Press, 1999), pp. 85–86.

³³ Certainly *some* children have just as much faculty of autonomy as most adults, (and some adults have just as little faculty of autonomy as most children). But age may nevertheless function as a heuristic for acquisition of the faculty of autonomy because it would

ism justified. The second reason for the liberal state to practice paternalism toward children recalls that government is not the sole encumbrance on the *facility* of autonomy. The facility of autonomy may be constrained as well by non-state actors that impede the capacity of individuals for genuine choice among a meaningful spectrum of projects and pursuits. Just as public officials and institutions may use mechanisms of force and law to undermine the facility of autonomy of citizens, so too may parental control over daily activities and accessible information undermine the autonomy of children.³⁴

The age threshold for the *faculty* of autonomy and the fact of extra-governmental barriers on the *facility* of autonomy together justify the liberal state in mandating practices that enhance on behalf of children general purpose life resources – akin to what Rawls calls ‘social primary goods’ – that are beneficial for almost *any* plan of life people might choose, not just for those that some might adopt but others reject. Rawls argues that whatever the differences among individuals’ ideas about what makes life good, the one thing every person shares is *some* such conception of the good, and certain resources are required for *all* such conceptions, whatever their more particular content. It is thus reasonable to expect that even children – who know little about the course their lives will take – could nonetheless agree, *ex hypothesi*, that certain goods (among which Rawls lists basic rights and liberties, income and wealth, and the social bases of self respect) are valuable for virtually *any* way of life from which they might later in life choose.³⁵ If any childrearing practices can be said to so enhance general purpose traits in offspring, surely a basic education is among them. By developing a range of social, behavioral, psychological, and intellectual skill sets, schooling helps prepare children for *whatever* life plan they may select, at least within liberal societies, and at least for the foreseeable future.³⁶

both be too impracticable and give the state too much power to distinguish those possessing the faculty of autonomy from those not possessing that faculty by any more precise means than establishing some standard age.

³⁴ Meira Levinson, *The Demands of Liberal Education* (Oxford: Oxford University Press, 1999), pp. 68–69.

³⁵ Rawls, pp. 54–55.

³⁶ There are, to be sure, a number of interests other than offspring autonomy served by the provision of basic education in liberal society: *children’s interests* in becoming independently functioning adults and informed and responsible citizens; *parents’ interests* in promoting the interests of their children; and *the state’s interests* in promoting the interests of

Natural primary goods and hypothetical consent

Thomas Nagel and Adina Schwartz object that some of the freedoms and resources among Rawls's list of primary goods, namely income and wealth, are not useful for some ways of life, such as that of, say, a religious communitarian who takes a communal vow of poverty, or a socialist who believes she is morally harmed by possession of more than the smallest amount of material assets.³⁷ There do exist certain *genetic* goods, however, which are at least minimally useful in the pursuit of all life plans. As an alternative to Rawls's *social* primary goods, I follow Allen Buchanan and colleagues in calling attention to the notion of *natural* primary goods: hereditary mental and physical capacities and dispositions that are valued across a comprehensive range of diverse and viable life plans.³⁸

My list of 'natural primary goods' includes absence of disability, resistance against disease, physical mobility and coordination, visual and auditory perception, short- and long-term memory, verbal and spacial reasoning, general cognitive capacity, and certain behavioral characteristics such as reflectiveness, impulse control, novelty seeking, and the capacity to abide adversity.³⁹ This list of natural primary goods is by no means intended as an exhaustive account of what sorts of traits are valuable; it is meant only to indicate which characteristics are useful *tout court*, that

children and parents, and in sustaining a range of public goods, including economic growth, civic virtue, and shared national identity. But among all interests served by education, the one most consistent with liberal neutrality is children's interest in becoming autonomous persons. Basic schooling assists in the pursuit of virtually any life plan from which children might choose. The best reason liberals can give for why a state should mandate education is that, as a primary good, education promotes the faculty and facility of autonomy of offspring.

³⁷ Thomas Nagel, 'Rawls on Justice,' *The Philosophical Review*, vol. 82, no. 2 (1973), pp. 220–234, 227–228; Adina Schwartz, 'Moral Neutrality and Primary Goods,' *Ethics*, vol. 83, no. 4 (1973), pp. 294–307, 302.

³⁸ Buchanan, et al., p. 174. Fritz Allhoff makes a similar argument in 'Germ-Line Genetic Enhancements and Rawlsian Primary Goods,' *Kennedy Institute of Ethics Journal*, vol. 15, no. 1 (2005), pp. 39–56, 50.

³⁹ Extensive studies on twins, families, and adopted children in the field of human behavioral genetics have confirmed ubiquitous genetic influence on complex dimensions of human behavior including psychopathology, personality, and cognitive abilities. See Robert Plomin, et al., 'The Genetic Basis of Complex Human Behaviors,' *Science*, vol. 264, no. 5166 (1994), pp. 1733–1739, 1735.

is, *whatever* one's life plan, no matter what one aspires to do or to be.⁴⁰

Moral principles which draw on goods so broadly inclusive of assorted projects and pursuits do not make controversial assumptions involving moral convictions about which ways of life are worthwhile, or which more valuable than others. Laying emphasis on natural primary goods is perfectionist only insofar as it favors lives in which genuine choice among a meaningful range of life plans is possible. State promotion of autonomy need not capture universal appeal for it to be compatible with the pluralism about human flourishing embodied in a minimalist neutrality: the idea that society is arranged best when governed by principles that leave citizens free to fashion and follow for themselves convictions about what constitutes the highest human purposes.⁴¹

Deprivation of any among the natural primary goods does not render the cultivation of autonomy impossible – people born blind or wheelchair-bound are of course routinely autonomous; nevertheless, the inability to see or walk necessarily and substantially reduces the range, and makes more difficult the pursuit of virtually all life plans from among which individuals may choose.⁴² Natural primary goods may be distinguished in this sense from natural *non-primary* goods: genetically influenced traits that may be advantageous or even indispensable for some or even many among the possible paths a child's life could take, but for others might not be useful at all. Natural non-primary goods include sex and height, sociability and tonal pitch, loyalty and generosity, skin pigmentation and sexual orientation. There may of course be tough in-between cases – anxiety, attentiveness, and habits of excess, for example – for which it is not immediately apparent whether designation as primary or non-primary goods is more apt, but the basic distinction between natural primary and natural non-primary goods remains tenable.

The connection between autonomy and hypothetical consent explains why liberals are committed to genetic enhancement of natural primary goods as a matter of moral obligation. If it is reasonable to have expected that Jean-Jacques Rousseau's *Emile*

⁴⁰ See Fox, 'Egalitarian Enhancement: Distributive Justice and the Distribution of Talents and Abilities,' under review.

⁴¹ See, for example, Dworkin, *Taking Rights Seriously* (Cambridge, MA: Harvard University Press, 1977), pp. 90–100, 168–177; Nozick, p. 33; Rawls, pp. 27–29, 392–396, 491.

⁴² Buchanan, et al., pp. 167–168, 174.

would, on the basis of *every* child's interest in autonomy, come to appreciate his tutor's pedagogy,⁴³ it is likewise reasonable to expect that *any* embryo would be grateful that safe genetic enhancement of natural primary goods had been carried out on its behalf. For any manner of instruction Rousseau could have provided may be far less effective and far more life plan-specific than would general purpose cognitive enhancements that became available through genetic engineering. And Rousseau's ignorance about Emile's plan of life pales in comparison to our ignorance of the life plans belonging to offspring who have not yet been born. Even a very young child demonstrates a distinctive ensemble of talents, dispositions, and potentialities of character that equip her for and direct her toward some life plans over others; but unborn offspring are what Ronald Green calls 'fungible, interchangeable generic units,' in the sense that they bear qualities all but identical to those of others in their cohort.⁴⁴

We know less about these future people, about 'what their desires, preferences, circumstances, needs, and habits will be,' Loane Skene and Tony Coady remark, 'than we do about people who now exist even in distant and disparate cultures and circumstances.'⁴⁵ What we *do* know about potential children is that each can reasonably be expected to wish for less disease, sharper vision, and greater impulse-control, provided these enhancements do not incur tradeoffs with other valued traits. Since it is only *qua* embryo that we can consider what is required by liberalism's commitment to offspring autonomy, whatever general purpose enhancements are required on behalf of *any* prenatal life must be defended on grounds that apply equally to *all* prenatal lives, by virtue of the unformed interests that each has a roughly equivalent chance of coming to have.

The Liberal Theory of Offspring Enhancement

Liberal eugenicists are right to note the moral semblance between reproductive genetic enhancements and traditional childrearing

⁴³ Jean-Jacques Rousseau, *Emile or On Education*, Allan Bloom (trans.) (New York: Basic Books, 1979).

⁴⁴ Ronald M. Green, 'Parental Autonomy and the Obligation Not to Harm One's Child Genetically,' *Journal of Law, Medicine, and Ethics*, vol. 25, no. 1 (1997), pp. 1–12, 8.

⁴⁵ Loane Skene and C.A.J. Coady, 'Genetic Manipulation and Our Duty to Posterity,' *Monash Bioethics Review*, vol. 21, no. 2 (2002), pp. 12–22, 15.

practices. But the analogy they draw is incomplete. It is true that just as a state guided by liberal theory accords parents wide discretion over safe *non-genetic* practices that enhance children's natural non-primary goods, the liberal state ought likewise to give parents wide discretion over safe *genetic* practices that enhance those same non-essential resources. But if liberals are to be consistent, then just as the liberal state requires parents to enhance their children's resistance to disease by way of inoculations and makes compulsory the enhancement of various cognitive, social, and intellectual skill sets via primary schooling, the state must also mandate genetic interventions that safely enhance comparable natural primary goods in embryos.

Universal ascription of hypothetical consent to prenatal lives for the enhancement of natural primary goods suggests an alternative theory to liberal eugenics for working out the moral status of childrearing practices from within the liberal framework. What I call the Liberal Theory of Offspring Enhancement is given by two distinct principles:

- (1) Parents are morally obligated to carry out safe and effective childrearing practices that enhance natural primary goods without distorting or impairing other valued capacities and dispositions.
- (2) Parents are morally permitted to decide whether to provide their children with enhancements for natural non-primary goods, so long as such decisions do not cause harm to offspring or others or undermine an important public good.

The first principle distinguishes the Liberal Theory of Offspring Enhancement (hereafter 'the Theory of Enhancement') from 'liberal eugenics' by making the enhancement of natural primary goods morally *obligatory*. So long as practices that enhance natural primary goods are safe, effective, and functionally integrated with other valued traits, the first principle requires that parents: (1) carry out on behalf of existing offspring available practices – genetic or otherwise – that either (a) enhance near-universally beneficial general purpose traits such as memory, visual perception, and general cognitive functioning, or (b) do away with or provide resistance against near-universally harmful general purpose traits such as blindness, paraplegia, or Down syndrome; and (2) refrain from carrying out on behalf of existing offspring

practices that introduce near-universally harmful general purpose traits. The first principle thus morally requires both genetic 'therapy,' meant to return offspring prone to disease and disability to a state of health, and also genetic 'enhancement,' intended to raise offspring talents and abilities beyond the normal workings of the mind and body.

The second principle renders the enhancement of natural non-primary goods morally *permissible*. Thus the liberal state may not use coercive measures to force parents one way or another to provide their children with genetic practices to enhance for non-general purpose traits like height or tonal pitch. Unless genetic enhancements for such traits would cause harm to others or undermine a sufficiently important public good, these decisions are left to the discretion of parents. To be clear, my scope in this essay is limited in application to normative rather than legislative guidelines. I compare genetic intervention to legally required practices like health care and education only to draw on the moral justifications these familiar practices help to elicit, and not to gesture toward substantive policy governing genetic practices. Likewise, in arguing for 'mandatory' or 'compulsory' interventions, I mean for such expressions to be interpreted only in the sense of moral and not legal obligation.

At least three public goods might be threatened by a laissez-faire approach to genetic practices that enhance natural non-primary goods. The first is a society marked by toleration for difference. Margaret Olivia Little argues that removal of genes for disfavored minority traits would reinforce and perpetuate unjust prejudice.⁴⁶ But whether the use of genetic biotechnologies to select against, say, dark skin or homosexual orientation, undermines a spirit of toleration depends on whether the message sent by such practices is that minorities are less worthy of acceptance and respect than of exclusion and genetic repair; or instead simply that the burden minority traits carry is so heavy that parents cannot reasonably be expected to sacrifice their children on the altar of moral principle.⁴⁷

⁴⁶ Margaret Olivia Little, 'Cosmetic Surgery, Suspect Norms, and the Ethics of Complicity,' in Erik Parens (ed.), *Enhancing Human Traits: Ethical and Social Implications* (Washington, D.C.: Georgetown University Press, 1998), pp. 162–176, 163.

⁴⁷ Dov Fox, 'Human Growth Hormone and the Measure of Man,' *The New Atlantis*, vol. 1, no. 7 (2004/2005), pp. 75–89, 80.

The second public good that parental discretion over natural non-primary goods might undermine is a balanced proportion of males and females within a population. Allowing parents to select for offspring of a particular sex might result in lopsided sex ratios, especially in societies such as India and China that prize males over females. Disproportionate numbers of males, Francis Fukuyama argues, could produce problems ranging from difficulty finding female mates to deteriorating family structures and escalating incidence of violence.⁴⁸ There are two reasons, however, why leaving decisions about sex selection in the hands of parents is unlikely in liberal societies to result in declining proportions of women. First, most fertility clinics address the concern about asymmetrical sex ratios by limiting sex selection services to families who already have more sons, and want a daughter, or who already have more daughters, and want a son. Second, where survey data from the United States, England, Canada, and Germany shows that parents in these nations indicate no strong preference for either sex,⁴⁹ it seems improbable that sex selection for family-balancing would in Western states be sought predominantly by families with fewer children of either sex in particular.

Third is that interventions which give individuals a genetic advantage relative to others might prove self-defeating when pursued collectively. Take enhancement for height. People care less about how tall they are in absolute terms than they do about how tall they are by comparison to others. Because height is distributed unevenly in any population, as some become taller, others become shorter relative to the average, and in the long-run enhancing many offspring for extra inches may simply reinstate the original distribution of height, leaving none better off than they would have been unenhanced.

Dan Brock contends the concern about self-defeat is compounded by the fact that many traits promising positional advantage – mathematical ability or physical endurance, for example – might be pursued for the sake of the intrinsic value of the activities those traits make easier – the ability to factor quadratic equations or hike the Peruvian Andes, for example – rather than for the instrumental value of the economic or social goods

⁴⁸ Francis Fukuyama, *Our Posthuman Future: Consequences of the Biotechnology Revolution* (New York: Farrar, Strauss, and Giroux, 2002), pp. 80–81.

⁴⁹ Edgar Dahl, 'Procreative Liberty: The Case for Preconception Sex Selection,' *Reproductive BioMedicine Online*, vol. 7, no. 4 (2003), pp. 380–384, 382.

they facilitate – the ability to audit a client's financial records with greater proficiency or become a star runner on the campus cross country team – that confer positional advantages.⁵⁰ But even if parents *intend* for offspring to appreciate the fruits of their enhanced traits in and of themselves, the *consequence* will remain that children acquire, retain, and remain free to access to get ahead in some competition for success. Yet even so, whether the concern about self-defeat provides grounds for eliminating decisions about positional goods from the private sphere would depend on how acute a toll the genetic arms race could be expected to take on medical resources and the pocketbooks of height-enhancing parents.

Private versus public genetic design

Faced with the five most compelling arguments raised against liberal eugenics, the Theory of Enhancement either causes them to fall away altogether or substantially diminishes their force. The first argument is that limited access to high-priced enhancement technologies confers genetic advantages only on offspring whose parents can afford them, thereby exacerbating inequality and unfairness in competitions for scarce benefits and prized roles. 'The ability to buy not only tools and opportunities to cultivate one's native capacities, but also to buy new or enhanced capacities themselves,' argues Erik Parens, 'would make some individuals doubly-strong competitors for many of life's goods.'⁵¹ Where liberal eugenicists can reply only that genetic enhancements are not *so* different in this respect from expensive, accepted enhancements like college test preparation and private musical training, the Theory of Enhancement largely sidesteps this argument by making the bulk of enhancements which happen to be most beneficial for prestigious and lucrative pursuits available to *all* offspring; supported, perhaps, by taxpayer subsidies, just as the liberal state does with public education and basic health care.

The second argument raised against liberal eugenics is that genetic design enables parents so inclined deliberately to engi-

⁵⁰ Brock, 'Enhancements of Human Function: Some Distinctions for Policymakers,' in Parens, *Enhancing Human Traits*, pp. 48–69, 61.

⁵¹ Parens, 'Justice and the Germline,' in Gregory Stock and John Campbell (eds.), *Engineering the Human Germline: An Exploration of the Science and Ethics of Altering the Genes We Pass to Our Children* (New York: Oxford University Press, 2000), pp. 122–124, 123.

neer offspring for harmful disabilities.⁵² Consider Sharon Duchesneau and Candace McCullough, a deaf lesbian couple from America, who sought a sperm donor with a family history of deafness for the express purpose of having a child who could not hear.⁵³ Liberal eugenicists claim that selecting for disability from among multiple embryos does not actually harm the resulting child. For the child could not otherwise have come into being without the disability; the only alternative for *that* child was never to exist in the first place. Liberal eugenicists see nothing wrong with parental selection for disability, so long as the child's anticipated level of suffering is not so awful that she can reasonably be expected to have preferred not to be born at all.⁵⁴ The Theory of Enhancement offers a more satisfying response, evading the selection-for-disability argument altogether by prohibiting selection for disabling traits like blindness and paraplegia, which – in closing off the possibility of seeing, doing, and understanding various capacities and experiences – appreciably impede offspring autonomy.

The third argument, raised by Jürgen Habermas, is that genetic enhancement imperils the sense of free will traditional childrearing practices allow children to retain.⁵⁵ Where children today ordinarily think it possible to reject and revise parental influences such as music lessons and sports camps, children subject to the 'one-sided and unchallengeable . . . programming intention' of parental design will not, Habermas speculates, view themselves similarly capable of resistance.⁵⁶ Habermas is aware that genetic engineering would not, as a matter of biology, determine the direction of offspring life plans to any greater degree than would random genetic recombination.⁵⁷ Yet while biology is not destiny, our origins, he observes, have a profound influence on our ability to 'conceive of ourselves as authors of our own lives.'⁵⁸ Habermas's

⁵² Brock, 'The Non-Identity Problem and Genetic Harms – The Case of Wrongful Handicaps,' *Bioethics*, vol. 9, no. 2 (1995), pp. 176–182.

⁵³ Merle Spriggs, 'Lesbian Couple Create a Child Who is Deaf Like Them,' *Journal of Medical Ethics*, vol. 28, no. 1 (2002), p. 283.

⁵⁴ Robertson, 'Embryos, Families, and Procreative Liberty: The Legal Structure of the New Reproduction,' *Southern California Law Review*, vol. 59, no. 1 (1989), pp. 987–1000, 987.

⁵⁵ Jürgen Habermas, *The Future of Human Nature* (Cambridge, UK: Polity Press, 2003), pp. 62–63.

⁵⁶ *Ibid.*, p. 51.

⁵⁷ *Ibid.*, p. 53.

⁵⁸ *Ibid.*, p. 42.

worry is thus not that genetic engineering would actually lock offspring into the role of their designer's choosing, but instead that *post-factum* knowledge of having been designed by another would give rise to feelings of genetic confinement that undermine a child's understanding of herself as free to shape the course of her own life.⁵⁹

Liberal eugenicists reply that knowledge about whether one's beginnings owe to chance or to choice has no bearing on the talents and abilities to which that same DNA contributes, or to the life prospects open to a child with those traits. It does not, as Agar points out,

make any condition that ails me better or worse . . . if a given psychological feature, be it good or bad, is the result of the random juggling of genes in the formation of my parents' sex cells . . . [rather than] the consequences [sic] of the intervention of another person.⁶⁰

Yet the disconnect liberal eugenics draws between consciousness of biological origins and tangible opportunity for advantage misses Habermas's more subtle concern that parental design will fracture the fragile conditions required for the human experience of freedom.⁶¹ The Theory of Enhancement, by contrast, diminishes the sense of genetic constraint designer children might suffer by shifting control over very many interventions from particular parents – with the sustained proximity and nurtural authority to reinforce narrow ideals or vicarious ambitions – to the nebulous state – with exceedingly less reach to accentuate or fortify what are at any rate general-purpose, life plan-non-specific enhancements.

I shall address the related fourth and fifth arguments against liberal eugenics in one go. The fourth argument, raised by Dena Davis, is that parental design provokes demanding expectations and oppressive socialization for children to turn out in the way parents hope.⁶² The fifth argument, raised by Oliver O'Donovan,

⁵⁹ Ibid., p. 81.

⁶⁰ Agar, 'Designing Babies: Morally Permissible Ways to Modify the Human Genome,' *Bioethics*, vol. 9, no. 1 (1995), pp. 1–15, 10.

⁶¹ Habermas, p. 34.

⁶² Dena S. Davis, *Genetic Dilemmas: Reproductive Technology, Parental Choices, and Children's Futures* (New York: Routledge, 2001), p. 33.

is that genetic design encourages parents to think of their children as morally inferior products of parents' creative will.⁶³ Liberal eugenicists can offer only the inadequate rejoinder that genetic enhancement differs little in these respects from aggressive preparatory regimes with which overbearing parents micro-manage their kids' lives today. The Theory of Enhancement, by contrast, shrinks the range of practices that threaten excessive expectations and corrupting attitudes by taking out of the hands of parents enhancements for traits like physical coordination and general intelligence which offer the greatest promise of advantage in the competition for prized places on athletic rosters or in university admissions.

Mandatory eugenics reconsidered

There remain four liberal objections one might raise against the Liberal Theory of Offspring Enhancement. The first objection charges the Theory of Enhancement with failing to respect the autonomy rights of children. Joel Feinberg argues that for offspring to be autonomous, they must have the maximal possible range of life plans available to them; children possess, Feinberg claims, the 'right to an open future': the right, namely, to be 'permitted to reach maturity with as many open options, opportunities, and advantages as possible.'⁶⁴ By allowing enhancements for non-primary goods, which are beneficial for some life plans *at a cost to others*, this objection goes, the Theory of Enhancement falls foul of the option-maximizing requirement of children's right to an open future. But liberalism does not accord offspring any such right. What is required to secure offspring autonomy is not access to the greatest *number* of life plans, but rather, first, the faculty – given by a cluster of personal abilities including knowledge, experience, emotional independence, and critical reasoning – and, second, the facility to choose freely among a reasonable range of life plans.

There are at least two reasons why parental values should be accorded some role in steering the direction their children's lives

⁶³ Oliver O'Donovan, *Begotten or Made?* (Oxford: Clarendon Press, 1984), pp. 1–2.

⁶⁴ Joel Feinberg, 'The Child's Right to an Open Future,' in William Aiken and Hugh LaFollette (eds.), *Whose Child? Children's Rights, Parental Authority, and State Power* (Totowa, NJ: Rowman & Littlefield, 1980), pp. 124–153, 130.

will take. The first reason relates parental decision-making to the social preconditions of offspring autonomy. Charles Taylor argues that individuals cannot exercise autonomy outside of a social environment – foremost among which is family – that provides life options which fit into patterns of activity and beliefs about value.⁶⁵ Parental decisions which reduce the absolute number of life plans available to offspring while at the same time giving context and meaning to socially embedded projects and pursuits are wholly consistent with liberalism's commitment to autonomy, so long as parental decisions preserve for progeny the opportunity for genuine choice among a diversity of viable life plans.

The second reason to reject Feinberg's option-maximizing principle relates private parental choices to the experience of intimate relationships within the institution of family. Conditions of privacy are a prerequisite, Charles Fried writes, for us to be able '[t]o respect, love, trust, feel affection for others and to regard ourselves as the objects of love, trust, and affection . . .'.⁶⁶ Ferdinand Schoeman argues that this intimacy is a source of deep value and meaning in people's lives; it provides the opportunity to 'share our selves' with others and have them share themselves with us in relationships of mutual trust, devotion, and dependence.⁶⁷ Far-reaching public incursion into childrearing decisions would jeopardise the experience of intimacy by displacing the sense that one's interests within the family are 'fused with those of another' with the sense that those interests instead serve public goals.⁶⁸ The Theory of Enhancement accordingly confers on parents considerable but not unlimited freedom to shape their children's future.

The second objection accuses the Theory of Enhancement with failing to respect the autonomy of parents. By depriving parents of the option to deny their children provision of natural primary goods, this objection goes, the Theory of Enhancement violates parents' right to raise their kids as they see fit. The claim of a categorical parental right over childrearing is often expressed as an extension of parents' rights to religious liberty. Parents among the Old Order Amish, for example, seek to remove their children

⁶⁵ Charles Taylor, *Philosophy and the Human Sciences: Philosophical Papers* (Cambridge: Cambridge University Press, 1985), pp. 190–191.

⁶⁶ Charles Fried, 'Privacy and the Limits of the Law,' *Yale Law Journal* vol. 77, no. 1 (1968), pp. 475–493, 477.

⁶⁷ Ferdinand Schoeman, 'Rights of Children, Rights of Parents, and the Moral Basis of the Family,' *Ethics*, vol. 91, no. 1 (1990), pp. 6–19, 14.

⁶⁸ *Ibid.*, p. 12.

from secondary education on grounds that high school exposes their children to ways of life at odds with their religious practices and beliefs;⁶⁹ while parents among the Christian Science Church withhold medical treatment from their children, even for life-threatening conditions, for the reason that use of medicine is incompatible with their faith in spiritual healing.⁷⁰ Religious liberty might also be enlisted as support for Robertson and Dworkin's procreative liberty claim of exclusive parental control over reproductive decision-making, since for many people, reproductive decisions are guided by religious beliefs.

While interests in family intimacy and the social preconditions of offspring autonomy justify letting parents make most childrearing decisions under conditions of privacy, they do not render the family immune to government intervention; a liberal state does not surrender a child to her parents altogether. Just as liberalism mandates health care and basic schooling for children, it must also mandate genetic enhancement of natural primary goods for embryos, whether parents agree or not. No liberal freedom extends absolutely to rights of action over other people, not even over one's own children. To respect the autonomy of children, liberals must disrespect parental decisions that obstruct offspring autonomy.

The third objection is that the Theory of Enhancement gives rise to government tyranny. It has been less than a century since the U.S. government enforced a mass sterilization programme in the name of eugenics, and less than half that time since the genocidal eugenics of Nazi Germany. The eugenic decision-making given by the Theory of Enhancement is similar to the eugenics of old in the sense that it is coercive, collective, and state-sponsored. But what was wrong with the old eugenics – as per autonomy-promoting liberal theory – was not its coercive character, collective undertaking, or state sponsorship *per se*, but rather the unjust norms of bigotry and exploitation which inspired violations of individual autonomy, bodily integrity, and equality before the law.

Consider widely accepted enhancements of natural primary goods such as schooling, vaccination, and statutes prohibiting marriage between relatives to prevent the incidence of resulting

⁶⁹ *Yoder v. Wisconsin* 406 U.S. 205 (1972).

⁷⁰ *Commonwealth v. David R. and Ginger Twitchell*, 617 N.E.2d 609, (Mass. 1993).

children born with birth defects. Mandatory education, inoculation, and incest laws are likewise coercive, collective, and state-sponsored, but liberals do not complain that *these* practices unjustifiably violate parental liberty, undermine family privacy, or impose on some the values of others. Just as state action can undermine the autonomy of citizens, so too can parental action undermine the autonomy of children. If the liberal commitment to offspring autonomy is important enough for the state to mandate traditional environmental enhancements for natural primary goods, then that very same interest is important enough for the state to mandate *genetic* enhancements for analogous autonomy-enlarging goods.

The fourth objection is that the Theory of Enhancement produces a 'tyranny of sameness.' The worry is that the collectivist approach to enhancement will flush out physical, psychic, and behavioral diversity, and so reduce the range of human forms in accordance with narrow or shallow cultural trends, diminishing the toleration of difference and plurality of values on which liberal society depends. This objection about homogeneity fails for the same reasons that standardised education does not, as John Stuart Mill feared, produce a standardised population.⁷¹ Like public schooling, genetic engineering would be but one formative influence among many, which alone dictates neither the course of an individual's life nor the content of her identity. People educated or engineered for the facility of autonomy will choose to lead very different kinds of lives; the only feature they need share in common is that it is not impossible for them to have chosen those lives freely.⁷² None among the children's rights, parents' rights, government tyranny, and social tyranny arguments is a decisive objection to the Liberal Theory of Offspring Enhancement.

Mismatch of Theory and Intuition

It is morally incoherent for liberals to reserve decisions about education for the public sphere, but leave genetic enhancements like general cognitive functioning to parental fancy. Since liberals

⁷¹ Mill, p. 177.

⁷² Levinson, pp. 38–40.

mandate basic schooling for children, what reason have they to worry about the government acting *parens patriae* to correct for parental unwillingness or inability to provide practices that enhance natural primary goods enhancements in embryos? A state-sponsored programme of genetic enhancement for natural primary goods would not, after all, express any particular conception of the good beyond that of offspring autonomy to which liberalism is already committed. Autonomy-promoting liberals cannot restrict their reasoning for mandating certain childrearing practices to the traditional kind; they must take analogous *genetic* practices on board as well. A truly *liberal* eugenics does not leave it to parents to decide whether to enhance offspring for natural primary goods; it makes these genetic practices a matter of public decision-making and collective obligation. Liberal eugenics is a betrayal of liberal philosophy.

Liberals reluctant to embrace mandatory eugenics have two choices. First, they may shake off their disquiet about compulsory genetic design, and heed the words of early twentieth-century American social reformer Sydney Webb, who in 1910 wrote: "No consistent eugenicist can be a 'Laissez Faire' individualist unless he throws up the game in despair. He must interfere, interfere, interfere!"⁷³ I suspect, however, that many liberals would regard mandatory eugenics as an unacceptable consequence. If liberal theory stands at odds with liberal intuition, this suggests the ethics of enhancement requires a richer moral vocabulary than liberalism allows. The language of freedom, equality, and fairness cannot give expression to deeply held convictions about the prospect of safe genetic modification. In a society in which genetic enhancement were practiced as a matter of routine, it would be radically more difficult, I argue elsewhere, to give a satisfying moral account of why the successful should adopt a charitable posture toward those who are less fortunate.⁷⁴ The divergence between liberal philosophy and liberal judgment, I wish to propose here, exposes a deeper paradox in liberal justificatory

⁷³ Sydney Webb, 'Eugenics and the Poor Law: The Minority Report,' *Eugenics Review*, vol. 2, no. 3 (1910–1911), pp. 233–241, 237.

⁷⁴ Fox, 'Designer Children and Civic Compassion,' under review; elaborating on arguments first made in Michael J. Sandel, 'The Case Against Perfection: What's Wrong with Designer Children, Bionic Athletes, and Genetic Engineering,' *The Atlantic Monthly*, vol. 293, no. 4 (2004), pp. 51–62, 61.

theories, which renders liberalism an impoverished framework from which to consider what sort of a biotechnologically advanced world it is we wish to leave for future generations.⁷⁵

*Department of Politics
St. Johns College
University of Oxford
Oxford, England OX1 3JP
dov.fox@politics.ox.ac.uk*

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