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Chapter VII. THE QUEST FOR DESIGNER CHILDREN. The Jewish Tradition
and Genetic Engineering

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CHAPTER VII

THE QUEST FOR DESIGNER CHILDREN The Jewish Tradition and Genetic Engineering

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From conception through birth it is hard to find an area where technology has not had an impact. Beginning in the 1960s, physicians began to use ultrasound to observe prenatal development and diagnose abnormalities. With the 1970s came more technological gymnastics, notably IVF, letting infertile couples conceive. The intervening decades have witnessed numerous other tests and treatments for the unborn, most recently embryonic genetic tests and fetal surgeries. Someday, physicians will diagnose genetic predispositions to disease, treat ailments before they occur, and correct those occurring at the genetic level. We may also witness non therapeutical enhancement.

Yet technology can leave couples facing difficult decisions they are emotionally unprepared for. Increasingly, couples expect perfect babies all the time, leading to a desire for designer-made-to-specification-"perfect"-children.

From the perspective of the Jewish tradition, technological advances force us to ask: when do humans become Godlike? Modern technologies represent a new power to control human destiny. As the late Lord Immanuel Jakobovits warned:

Genetic engineering may open a wonderful chapter in the history of healing. But without prior agreement on restraints and the strictest limitations, such mechanization of human life may also herald irretrievable disaster resulting from man's encroachment upon nature's preserves, from assessing human beings by their potential value as tool-parts, sperm-donors or living incubators, and from replacing

the matchless dignity of the human personality by test-tubes, syringes and the soulless artificiality of computerized numbers.¹

This paper examines what the Jewish tradition has to say about what limits should exist on the gratification of parents' desires, when in the future technology will allow parents to fulfill their wish for a "perfect" baby. Should we fashion children to specification? Should we try to defeat aging and death? Should we use every new technology? Should we preserve the elements of life's mystery? How much room should we leave for God? How can we enrich the human condition yet continue to exalt the Eternal? Ultimately, we must ask: What does it mean to be human?

In answering the questions of what is God's Domain, is it wrong to tread on the Eternal's Territory? The Book of Genesis sounds a cautionary note, reminding us of the warning coming from the tale of the Tower of Babel: Do not tamper with the "natural" order. Not everything humanity wants to do is proper. The attempted construction of the Tower of Babel provides a commentary on human hubris, the overstepping of appropriate bounds.² At Babel, humans wanted to show that their ingenuity had the capacity to reach to the level of God. They set out to build a tower that would rise up to heaven itself. The Eternal, we are told, preferring that humans stay within the earthly domain, halted the structure by confounding language and dispersing people across the globe.

This paper offers a much more positive note. God gives us the tools and the knowledge to tamper with the Divine arrangement of the world. The Jewish tradition teaches that we should cure, if not prevent, diseases and disabilities, regarded as harmful evils to be overcome. We can aid God in the Divine act of healing and curing. The mainstream of the Jewish tradition welcomes therapeutic genetic engineering but not genetic enhancement, which I favor. Leave it to individuals to decide and implement what they regard as a "good"

change, what is normal or desirable. Allowing people to do what they want for their progeny will not undermine our humanity.

THERAPEUTIC GENETIC ENGINEERING

Moving beyond prenatal genetic testing and embryo selection, physicians may some day engage in prenatal genetic therapy enabling them to cure genetic disorders by inserting normal or modified genes in sperm or eggs or while a zygote or an embryo is in vitro or a fetus is in the womb. Therapeutic genetic engineering will be used where the far safer and less complicated genetic embryo screening cannot be employed to deal with a range of diseases from the nearly inconsequential to those affecting a person's quality of life, to the life-threatening – to replace the missing enzyme causing Tay-Sachs or repairing the defective gene otherwise resulting in hemophilia or Huntington's disease (a degenerative nerve disorder that usually appears between the ages of thirty-five and fifty). We will engage in preventive measures, curing a potential illness or disability in gametes, a fertilized egg, an embryo, or a fetus.

Beyond inherited, clearly defined genetic diseases such as Tay-Sachs, in our genes we carry susceptibility to various other diseases, potentially causing debilitating or deforming illnesses or conditions. Thus, our genes make us at greater risk to certain physical diseases, such as cancer, cardiovascular problems, and arthritis as well as mental disorders, such as depression and schizophrenia. Various kinds of behavior, such as alcohol and drug abuse, may be genetic in origin. With respect to these diseases and behaviors, multiple genes interact in complex, not currently understood, ways. For many illnesses and traits the interaction between genetic and environmental influences is complicated.

In discussing therapeutic genetic engineering, it is helpful to distinguish between somatic and germline intervention. Somatic therapy modifies the nonreproductive cells of a fertilized egg, an

embryo, or a fetus that do their thing and disappear when we die. This technique corrects the functioning of a defective or condition gene or replaces it, thereby curing a disease at its root. Any genetic changes in a cell line affect only the individual in question.³

With germline therapy,⁴ genetic changes are made in reproductive cells so that new configurations are passed on to future generations. Perhaps sooner than we think, physicians will be able to tinker with the genes of reproductive cells, thereby changing future progeny, allowing parents to take corrective action in the sex cells of their sperm or eggs, a fertilized egg, at the early embryonic stage in vitro, or a fetus, and thus eliminating genetic diseases or conditions from future generations at less expense than somatic therapy in successive generations. It represents what experts have described "as the ultimate form of preventive medicine in that we can potentially prevent certain types of diseases even before a person is born."⁵

THERAPEUTIC GENETIC ENGINEERING AND THE JEWISH TRADITION

The Jewish tradition views as divinely sanctioned, if not mandated, the acquisition of knowledge to cure human illness and disease. The pursuit of knowledge does not involve the forbidden eating of the fruit of the tree of knowledge,⁶ which we are told led to the expulsion of Eden. The Psalmist writes: The heavens are the Eternal's heavens, but the earth God has given to humanity.⁷ Thus, the pursuit of knowledge represents a legitimate activity for humans, not an encroachment on God's plan for this world. Knowledge is value neutral; it depends on how we use our new power.⁸

The Babylonian Talmud interprets the biblical phrase "and he [an attacker] shall surely cause him [his victim] to be healed,"⁹ as allowing the use of knowledge to cure disease and heal illness.¹⁰ This use of knowledge may even be biblically mandated on the basis of the biblical obligation to restore a lost object,¹¹ including the restoration of lost health. Medicine, thus, as one Reform responsum states,

“becomes an obligatory and not merely a permitted practice.”¹²

We go against nature when we prevent or cure a disease. Nature and natural processes are, however, not sacrosanct in the Jewish tradition. We actively seek to change our medical possibilities. The Jewish tradition, by accepting and legitimizing human intervention to affect cures, extends this positive approach to medical procedures before conception, in vitro, and in the womb. Traditionalists and more liberal commentators approve of therapeutic genetic engineering. Gene therapy, assuming it is a proven form of medical treatment, aims to prevent disease, restore health, and prolong life, all of which are acceptable goals within the physician's Divine license to heal.

Gene therapy to replace the missing enzyme causing Tay-Sachs disease or to repair the defective gene resulting in hemophilia or Huntington's disease are sanctioned under Jewish law because they are done with the intent of restoring health and prolonging life. This type of gene therapy represents a legitimate implementation of the physicians' mandate to cure the sick, thereby doing the Divine work of restoring health. Physician Fred Rosner, a traditionalist, maintains that therapeutic genetic engineering serves as “a legitimate modification of the natural order,” and does not “undermine God's creation of the world by manipulating nature.”¹³

Liberal commentators take a similar, permissive view of gene therapy as an extension of medicine. Because Jewish sages sought to avoid genetic problems, Conservative Rabbi David Golinkin reasons they would approve of gene therapy aimed at eliminating serious or fatal genetic diseases both before or after birth.¹⁴ Any surgery permitted on a person is permissible on a gene before conception, in vitro, and during gestation. Because the Jewish tradition has a presumption in favor of curing illness, Conservative Rabbi Elliot N. Dorff sees therapeutic genetic engineering as an “unmitigated blessing.”¹⁵ Focusing on disease, Dorff goes so far as to suggest: “I would be inclined to permit stem cell change as well as somatic cell

change, for I do not see any reason why it should be permissible to cure a disease in one particular fetus and not in that fetus's future offspring as well. On the contrary, since sickness is degrading, it would be our *duty* to cure the disease at its root if we could so that future generations will not be affected."¹⁶ One Reform responsum concludes: "We may be ready to accept genetic changes made for medical purposes and experimentation as [*pikuah nefesh*] an overriding consideration."¹⁷

In short, if safe and effective, it would be hard to imagine any Jewish opposition to therapeutic genetic engineering.¹⁸ The Jewish tradition would allow humans to use this technique to prevent disease and disability. The next generation and those that follow would prefer health to disease or disability. With safe and effective germline genetic engineering, laboratory conception will become ever more prevalent, if not mandatory.

THERAPEUTIC GENETIC ENGINEERING AND THE EXTENSION OF LIFE

Therapeutic genetic engineering, whether of the somatic or germline variety, offers the promise of extending the maximum human life span, doubling it to 150 to 200 years, by curing major genetically based diseases and possibly tackling and arresting the aging process and curbing the indignity of bodily and/or mental deterioration. The longevity barrier, now about 120 years, may be torn down as we learn more about the genetic mechanism of cell aging and perfect intervention strategies, including genetic therapy, stem cell technologies to provide a nearly indefinite supply of replacement tissues and organs, and hormones (and other pharmacological means) to restore and enhance bodily vigor.¹⁹ It may be possible to extend human life to perhaps 200 years, with the mind and body intact, preserving one's youthful appearance and strength, and warding off disease consistent with a relatively high quality of life and functional level until the end of one's life span. Individuals may have six careers,

four master's degrees, three spouses. Women may have children in their 60s. Five or more generations may know each other.

The Jewish tradition would respond positively to life extension techniques. According to Modern Orthodox Rabbi Barry Freundel:

In Judaism, life is a positive value. In fact, one could argue that it is an infinite value. A longer life gives a person more time to be involved in good deeds and the tasks presented by G-d to this world as His challenge to us. Increasing life expectancy through genetic manipulation is not different than increasing life expectancy by better management of disease or by developing new surgical procedures. Any type of increase in length of life is a positive for which the provider is deemed meritorious to the highest degree. Sanctity of life for us means increasing that life to the fullest extent possible.

... Every hour added to someone's life comes with the possibility of doing good deeds and repentance and is, therefore, more valuable in this way than all of life in the world to come.²⁰

Some bioethicists, however, advocate a static, closed-end notion of human existence. Having limited aspirations for technological innovation and progress, they conclude that career and family ambitions can be satisfied within the biblical three score and ten years and now through current medical advances, three score and twenty years or an eighty-year life span. They do not view a longer life for individuals as an unqualified good.²¹ Rather, as Dr. Leon R. Kass puts it, "The finitude of human life is a blessing for every individual whether he knows it or not."²²

Other experts do not view life extension as an expression of a childish, narcissistic wish. Placing it in a positive light, they see anti-

aging techniques as providing the opportunity for the further blossoming of humanity, offering personal and societal benefits of a longer, even more vital lifespan.²³

The possibility of preserving our youth, coupled with the postponement of both age-related diseases and a general age-related decline, is seductive. Despite the warnings of technological pessimists, most of us, I believe, would want a longer, healthier existence, especially if the additional years remain ones of physical and mental vitality, not marked by a lower level of cognitive functioning.

The prospect that people will be healthy for most of their old age will alter every phase of human existence. Certainly more people will have several families with a higher proportion of stepchildren. Given the already high incidence of divorce, however, will marriages survive for more than one century? Will other forms of relationships exist to complement or supplement marriage?

Making lives longer raises questions of profound social economic and political impact and presents the specter of gigantic generational clashes, including how to fund Social Security and Medicare for the very elderly and how to provide work and career opportunities for younger generations. Seniors may want to preserve the world as they know it. A ballooning in the population, at least in developed countries, will increase the global demands for food, water, and energy, further burdening the earth. Distributional questions will also arise if only the wealthy are able to afford these procedures that likely will begin with the embryo or fetus and continue thereafter. If only the rich can cheat death through the new techniques, including expensive gene therapies, pressure will build to use public funds to pay for the pre- and postnatal treatments. Cheaper procedures may enable societies to overcome these economic inequities. Other negative consequences may require societal foresight and planning, including constraints on the number of births.

Before we get carried away with the new means to extend human existence, it is important to limit our notions of genetic

determinism. Some diseases are linked to a single gene, such as Tay-Sachs. For these diseases, we have made (and will continue to make) great strides in identifying the gene and the incorrect coding sequence (more precisely, a wrong allele) in the gene.

Most of the associations between genes and our health are, however, more complex, involving a combination of many genes often in hard-to-fathom interactions. Even if we master these complexities and engineer people with genes not only for longevity but also for a reduced susceptibility to physical illness and mental decline, most diseases are multifactorial, that is, they result from a combination of genetic, dietary, and environmental factors. Many ailments, such as lung cancer, arise from genes interacting with environmental influences. Unless environmental improvements are also undertaken, a 120-year life span may be a more realistic maximum age for most of us. Nongenetic and nonenvironmental factors, such as chance events, also play a role in good health and longevity.

Whether we live 80 or 150 years, the question remains: how will each of us use our years? Will we lead different, better, more productive lives with more vital years to contribute? Will we be concerned with guiding the generations that follow us and passing on our acquired wisdom, values, and awareness?

Despite our best efforts, earthly life will remain finite. Life will still gain value knowing we have limited time and resources on earth before we die. Our finiteness will continue to force each of us to focus our time and energy on what is important in our life.

NON-THERAPEUTIC GENETIC ENGINEERING

Genetic procedures may serve nontherapeutic purposes, improving human appearance, functioning, or performance, beyond what is needed to restore or sustain good physical and mental health.²⁴ Genetic testing may be used to screen and abort "defective" fertilized eggs, embryos, and fetuses manifesting "undesirable" traits or

characteristics. Also, these traits or characteristics, such as height, hair, or eye color, may be modified or changed by genetic engineering. For instance, physicians will some day alter genes for height in pre-implantation embryos or fetuses. They may seek to change complex human traits, intelligence or personality, each of which is coded by a large number of genes. This means that parents will be able to begin to design their own babies, replacing genes already there for what they regard as undesirable traits, adding genes not there for what they regard as desirable traits, and altering, to some degree, personality and intelligence. Genetic enhancement will increase their children's opportunities for a long, healthy life, marked by happiness and success.

For purposes of the discussion that follows, I will assume that genetic enhancement is safe and effective. This is not to deny the possibility of deleterious side effects or unanticipated long-term negative consequences that may show up years later, even after rigorous animal testing, but one expert predicts, "No matter what technique, or techniques, are ultimately used, genetic engineering of human embryos is sure to become feasible, safe, and efficient by the middle of the twenty-first century."²⁵

GENETIC ENHANCEMENT AND THE JEWISH TRADITION

The Jewish tradition remains divided on nontherapeutic gene manipulation, with the likelihood that most progressive authorities will reach a negative conclusion. Nearly three decades ago, Azriel Rosenfeld, an Orthodox rabbi, supported the use of genetic techniques to enhance humans. Rabbi Rosenfeld noted:²⁶

Our sages recognize, and perhaps even encourage, the use of prenatal (or better, preconceptual) influences to improve one's offspring: Rabbi Yohanan (B. Ber. 20a, B. B. M. 84a) used to go and sit at the gates of the

place of immersion, a *mikvah* (the pool where women immersed themselves following their menstrual period so they could resume sexual intercourse with their husbands), saying: "When the daughters of Israel come out from their required immersion, they look at me that they may have sons who are as handsome as I and as accomplished in Torah as I."

It is unclear whether Rabbi Yonanan, whom Rabbi Rosenfeld referred to, intended only to give advice, not to promulgate a legal ruling. Rabbi Yohanan's admonition, however, may well extend to allow the use of genetic engineering to produce physically and mentally superior children.

Looked at from another angle, some traditionalists may view genetic engineering on an egg or sperm before conception (or a fertilized egg, an embryo, or a fetus) as permissible because genes are submicroscopic particles. Under Jewish law, no process invisible to the human eye is forbidden.²⁷ In other words, things not visible to the eye are excluded from legal consideration.²⁸

Some traditionalists, notably Rabbi Freundel, seem open to genetic germline enhancement. Looking favorably on humans gaining control of their own evolution, Freundel writes:

Anything which improves the individual or the species will ultimately be viewed favorably from a Jewish law perspective.

Certainly, there are potentials for abuse in this technology. Eugenics, abusive and selfish construction of children to meet particular standards and personal fantasies, and "brave new world" scenarios are all possibilities and must be protected against. However, Judaism approaches such questions with a fundamental optimism. It believes that mankind will find ways to

produce far more that is positive than is negative from its technological advances. In addition, if human beings were given free will by their Divine Creator, limiting their ability to make choices that have moral content would in itself be a denial and denigration of the special place that human beings hold in creation.

For Judaism, there is no doubt of either a practical or philosophical nature that a world that possesses this [gene modification] technology would be far better than a world that does not. I believe, therefore, that the traditional segments of our community would advocate for more research and development of technological possibilities. This should be done with appropriate regulation to ensure that uses of the technology are positive and not abusive.

Even if the question is phrased to focus on human beings gaining control of their own evolution, I do not find that to be any more troubling than discussing any other human capacity to alter the natural world. I take this position as a result of Judaism's teaching that human beings are the most important part of G-d's created universe. In mystical literature, human beings come from a higher place in G-d's economy than the angels. G-d has entrusted this world to humankind's hands, and the destiny of this world has always been our responsibility and challenge. Whether or not we live up to that challenge is our calling and essential mission. If G-d has built the capacity for gene redesign into nature, then He chose for it to be available to us, and our test remains whether we will use that power wisely or poorly.²⁹

Other traditionalists may be much more wary about whether non-therapeutic genetic engineering represents an inappropriate use of technology. They may look to the Babylonian Talmud, where we are told that after God inspired Adam with a type of Divine knowledge, Adam bred two dissimilar animals and created a mule, a sterile animal.³⁰ In response to the question, "Why are they called mules?" the Babylonian Talmud answers, "Because they cast fear upon people."³¹ By changing the Divine creation of the world, Adam is viewed as inappropriately using nature. Thus, physician Fred Rosner, a traditionalist, asserts that nontherapeutic genetic engineering to improve physical traits and characteristics "is frowned upon in Judaism if it serves no useful medical or psychological purpose."³²

Liberal commentators reach a similar negative conclusion. Conservative Rabbi David Golinkin would limit the use of gene therapy to the prevention and cure of diseases or conditions.³³ He reasons that the Jewish tradition, permitting, if not mandating, Jews to be involved in medicine, speaks of using it only for therapeutic purposes. Golinkin also bases his opposition on a repugnance of eugenics. He notes that societies using science and technology to improve human qualities "have historically abused their power in pursuing eugenic goals." However, the term "eugenics," however distasteful for Jews in view of the Nazi horrors, refers to state-sponsored efforts, not the product of parental choices.³⁴ Golinkin also fears human-made "freaks" because there is no way of setting limits on "smarter, taller, and stronger children." He concludes that non-therapeutic genetic engineering is "not in keeping with Jewish ethics and theology."

Despite these misgivings and negative conclusions expressed by commentators, as we learn more about the genes for different temperaments, body builds, statures, and cognitive abilities, some prospective parents will want to choose their unborn child's traits and characteristics. How will Progressive Judaism respond?

In answering this question, I see no relevance to the stories concerning *golems*, artificially created "humans," to the situation of genetically engineered children who derive from a fertilized human egg, implanted in the uterus of a woman, who gives birth to the child. As one Reform responsum notes, "These stories arose in the Middle Ages and are akin to those found in other folk mythologies. The *Golem* was thought to be a clay or wooden figure brought to life by its master through the insertion of the divine name in its mouth, or the placement of the name on its forehead."³⁵ The genetically enhanced child, however, is a human being.³⁶ As the responsum continues, "It will have been formed from human material despite all genetic alternations.... Hopefully, it will then not be enslaved to its maker or master, but will develop independently as other human beings. Unless such possibilities of independent intellectual and moral development are gradually removed, this would be a human being."³⁷

BROADER IMPLICATIONS OF NON-THERAPEUTIC GENETIC ENGINEERING

Beyond textual analysis and knee-jerk fears about eugenics, nontherapeutic genetic engineering designed to pick or alter one's offspring's physical or behavioral traits, thereby fiddling with the genes controlling how we turn out, encounters strong resistance on a number of grounds, even assuming the requisite technical ability and the safety of the procedures. Opponents of nontherapeutic genetic therapy raise two major objections: first, it demeans human dignity, and second, it raises serious distributional questions as well as more minor reservations – namely, it gives too much power to the current generation and may increase prejudice against disabled individuals.³⁸ Each of these objections is debatable, however, resting on various assumptions and value premises.

GENETIC ENHANCEMENT DOES NOT THREATEN HUMAN DIGNITY

Focusing on the impact of genetic engineering on human dignity, a quality of being worthy of honor or respect, critics raise two points: first, it impinges the freedom of offspring, and second, it turns them into commodities in the marketplace.³⁹ Opponents assert that children ought to be autonomous beings with their own lives to live. Subjecting a child's basic physical appearance and potential talents to parental whims impinges on one's ability to develop his or her unique self. A child's preferences concerning various benign traits or characteristics should be left to his or her own values. In other words, decisions about benign traits or characteristics are not always best left to parents. Using genetic technology to determine what children will become, makes offspring partial hostages to parents' genetically designed blueprints.

Furthermore, non-therapeutic genetic engineering may serve to treat fertilized eggs, embryos, and fetuses, it is asserted, as commodities, objects of manufacture, raw material for manipulation, custom-ordered products in the genetic services marketplace, not as potentially sacred human beings. Allowing parents to manipulate a child's genetic characteristic and making him or her in the image of a couple's own preferences and desires, may lead to a consumeristic attitude to a child's development and personality. It may dehumanize and depersonalize children, undermining or significantly changing the meaning of the parent-child relationship, by reducing a child to the object of technological manipulation and design, at least in the mind of the child and his or her parents.

I would let parents make the choices of what they value in their offspring, whether to be disease free, at least genetically, or come with perks, such as musical talents or athletic ability. People today enhance their appearance or health through medical technology. The demand for cosmetic surgery shows how important people consider it to look good. Drugs are used to treat obesity. Short children

receive human growth hormones. It is not "immoral" to defy nature. We do it all the time.

Thus, I would allow parents to decide whether to take their chances on the traditional genetic lottery, using unaltered egg and sperm, realizing that their offspring may inherit "undesirable" traits or characteristics, or undergo corrective gene changes on their sperm, eggs, zygotes, embryos, or fetuses. Let parents decide whether they want to turn to genetic modifications to improve opportunities for their progeny. Again, a degree of realism is in order. As one commentator concludes,

... [O]ne of the main reasons that couples have babies is to produce their baby, the product of their combined genes. Motivations don't get much more basic than that, and I think it unlikely that the typical parents will want to distort the process too much. The popular uses of gene manipulation are likely to be the ones that avoid birth defects and ones that lead to improved overall physical and mental abilities. I find it hard to get upset about that prospect.⁴⁰

As parents reflect on whether to use nontherapeutic genetic engineering, it is only natural that they want what is "best" in life for their children. Certain human abilities and characteristics are valued over others – height, intelligence, looks, an outgoing personality, and a stable temperament. Many parents, wanting to provide their children with the greatest advantage possible in life, will try to increase the odds that their progeny will "succeed" in life. "Good" genes are presumably correlated with "success" in our society. They want them to lead "better" lives. Others may want athletic ability or artistic and musical talents.⁴¹

There may be social pressures to select certain traits or characteristics. Genetic interventions may be faddish or politically

correct. Many might follow a stereotype: intelligent, tall, thin, of moderate temperament and personality. There are often societal pushes to do many things in life.

It does not seem likely that parents will love their children, any more or less, for who they are, regardless of their abilities or talents, whether the children result from the biological lottery or are engineered in an effort to make them what their parents want them to be. Furthermore, the parental choices will lead to as much or even greater diversity as presently exists. A technology proponent asserts: "One thing we can count on, though, is that any combination of personality and temperament that predisposes people to embrace biological selection and enhancement will be highly represented among those who use genetic enhancement."⁴² Thus, with the technological choices offered, children will probably be as diverse and unique as they are now.⁴³

It does not seem to me wrong to trust ordinary people who want the "best" genes for their children. If we have safe and effective choices, why ought we to passively accept our fate as embodied in our genes? Why not let parents strive for healthier, smarter, more physically and emotionally attractive children? Because they will appreciate being healthier, somewhat smarter and more attractive, most children will thank their parents.

DISTRIBUTIONAL FEARS RAISED BY GENETIC ENHANCEMENT ARE OVERBLOWN

Critics emphasize distribution concerns and socioeconomic disparities, focusing on a lack of equity in access to the new technologies, thereby magnifying the current social inequities and class divisions in American society.⁴⁴ Couples who can provide their children with an optimal environment would also acquire the best genes for them, further advantaging their progeny. The widening gap between the haves and have nots may ultimately lead to the

polarization of society into a genetically privileged ruling elite and a genetically disadvantaged underclass. One technology proponent, Lee Silver, a molecular biologist, paints a chilling scenario of competing human beings in which a class he calls the "Gen Rich," improve their children's cognitive abilities to the point that they break off from the remainder of the human race, "the Gen Poor," and form a separate species.⁴⁵ In short, parental choices could have serious, unintended, long-term societal consequences.

On the basis of an egalitarian ethic, these arguments will in all likelihood resonate with the mainstream of the Jewish tradition. In the biblical account of human creation, we read that God created one person (Adam) from whom we are all descended.⁴⁶ We all are of infinite value, which, however, often, mistakenly in the view of Rabbi Freundel,⁴⁷ gets extended to a notion of human equality or equivalence.

Furthermore, we must again face reality. Children of well-off parents enjoy the advantages that wealth can confer. Parents now improve their children's capacities and life prospects through the best possible health care, private schooling, music and computer lessons, and summer camp. Individual self-improvement is generally viewed as laudable. Parents generally want to raise their children in an optimal environment as favorable to "success" as is possible.

Engineering genes represents another way parents can strive to make their children "better" than the average in some way and give them the best possible future. It permits them to pass on genetic gifts together with monetary and environmental benefits.

In the future, people with money will be able to give their kids not only a better environment, such as private schools, but also better genes. The wealthy will opt for children with the best cumulative set of genes – emotional stability, long-term optimism and happiness, inborn talents, increased creativity, healthy bodies; whereas families of the underclass face obesity, heart disease, hypertension, alcoholism, mental illness, and a predisposition to cancer. Beyond the individual

decisions of the wealthy, society may disparage children whose parents, affluent or not, allow them to be born mentally dull, obese, or of short stature, among other cosmetic imperfections of the moment.

If access to beneficial genetic technologies depends on income or wealth, the well-off will, for example, become healthier, at least overall. Barring the implementation of some system of universal healthcare in the United States or making these therapies an entitlement for all, these distributional concerns simply prove too much. In a modern capitalistic society, the wealthy and their offspring have and will continue to have access to opportunities, whether better healthcare or genetic services, the economically disadvantaged do not have. Rather than leveling everyone by impeding access, modern technologies open the door to opportunity and encourage all to become wealthy through hard work, perseverance, entrepreneurial activity, thrift, and sound, long-term investments.

Moreover, genetic enhancement technology probably will not remain expensive. Similar to the development of personal computers, where technological advances and the market economy made computers cost effective and widely available, this technology will in all likelihood become sufficiently cheap for the nonwealthy.⁴⁸ If not, the disadvantaged may not stand by when biological alterations give some advantages over others, particularly a better chance to succeed. Pressures may build for these advanced therapies to be an entitlement, with public funds providing access for everyone. As one opponent of genetic engineering, who calls for the establishment of new national and global governmental agencies to regulate the biotechnology revolution, states: "It seems highly unlikely that people in modern democratic societies will sit around complacently if they see elites embedding their advantages genetically in their children. . . . [T]he specter of rising genetic inequality may well get people off their couches and into the streets."⁴⁹ Modern welfare states will probably strive to bring about a more genetically egalitarian society in which inexpensive, widely available technology offers the possibility of

raising up the "bottom" through public sector funding and sponsorship.

I would, therefore, allow individuals to make their offspring as they wish. Permit them to provide not only the best environments for their children but also the best genetic natures. Let parents strive to create what they regard as genetically flawless, errorless, perfect offspring, without warts and wrinkles, vulnerabilities and frailties. Parents want to facilitate their children's possibilities for success, but even the best of genes and environments do not guarantee "success."

THE BENEFITS OF GENETIC ENHANCEMENT OUTWEIGH POSSIBLE DISCRIMINATORY IMPACTS

Opponents point to genetic engineering as possibly exacerbating the prejudice against persons with disabilities or even those viewed as less than "perfect."⁵⁰ Selecting offspring that conform "best" to social norms, health and physical ability, appearance, and aptitudes may lessen society's tolerance, at least so the argument runs, for those with genetic or congenital disorders, whether shortness, less than a normal IQ, or a different physical build. The genetically superior may come to be contemptuous of their "inferiors." As Conservative Rabbi Dorff puts it, "[G]enetic engineering raise[s] the questions of whether in the future we will still appreciate God's creativity in making people different or whether we will instead try to make everyone the same, presumably like the majority of us."⁵¹

I would let individuals weigh the possible impact of their choices on social factors, such as discrimination, in deciding whether to avail themselves of modern therapeutic techniques. The potential good outweighs the possible harm. We have devices to help the disabled cope; why not avoid the problems in the first place? Why would anyone want to inherit a genetic disease?

If we diminish numbers of children and adults with a genetic disease, the argument runs, society would ignore those still afflicted,

proves too much. Following its logic we would end medical treatment for any afflicted children and adults.

In the Jerusalem Talmud we read Ben Azzai said: The most important verse in the Torah is this (Gen. 5:1): "This is the record of Adam's line. When God created the human being, the Eternal made the human in the Divine likeness."⁵² Personal decisions to engage in genetic engineering do not negate our ideal of seeing everyone as created in God's image and valuing people on an individual basis for their achievements and their potentials, even if some disorders are being eliminated from the gene pool.

GERMLINE THERAPY WILL NOT GIVE PARENTS' DEAD HAND CONTROL OVER SUBSEQUENT GENERATIONS

The application of germline therapy in gametes, fertilized eggs, embryos, and fetuses raises the specter of the "dead hand" of parents exercising dominion over generations to follow. Again, fears about changing and potentially curtailing the autonomy of one's descendants for all time are overstated.

Given the attendant risks and tradeoffs, parents will face difficult decisions, as they do now, about what is best for their children. Parents may make unwise choices, bringing grief to them and their progeny. These choices, however, often will be remediable; they likely can be undone.

The likelihood is that germline therapies are not irrevocable and unalterable. Subsequent generations could elect to remove an enhancement, for instance, by undergoing some type of genetic procedure, deleting the added genes (or genetic information), replacing one type of genetic information with another piece, introducing new genes to remove any defective or "bad" genes or in some other way compensating for or dealing with their presence.⁵³

Even if some of these changes are irreversible, thereby curtailing the autonomy of and imposing on future generations a

parent's concept of health and values, why not allow the present generation to give future generations enhanced capabilities – for example, the capacity to be more intelligent – thereby lifting them to the peak of human potentialities? Leave it up to each couple to make these choices in a responsible manner, on an individualized, decentralized basis. Through trial and error let them use genetic technology to help their progeny. In exercising their autonomy, parents should remember that what they choose may not turn out for the best in light of future conditions. Also, far from all the basic characteristics of a human are genetically determined. Our environment and our free will play roles. Because parents may be thwarted in attempting to control how their children's lives will turn out, many may come to accept the limits on their control.

SOME CONCLUDING THOUGHTS ON GENETIC ENHANCEMENT

A need exists to reject the rather simple-minded and naive biological determinism, ascribing everything to our genes, the qualities, personality, physique, temperament, intelligence, of who we are. The improvement of one gene will not necessarily enhance a human's entire system in a beneficial and harmonious manner. Genetic causation is complex. One gene may have multiple effects. Multiple genes interact to create behavioral traits. Intelligence, for example, has, to a large degree, genetic causation; however, the causal relations are complex. Thus, one influential commentator on science issues concludes that it is doubtful we will be able to bioengineer superathletes or superscholars.⁵⁴ Immense challenges await us in achieving superhuman attributes.

All children, including designer offspring, will still be subject to the vicissitudes of their environment and life experiences as well as the vagaries of random forces, such as chance. Social and environmental factors have an incalculable and continuous influence on human growth and development; parents will come to realize they

have some, but less than total, control over these forces. Thus, if parents give a child the athletic and musical genes to be a dance wiz, the kid may turn out to be a total klutz. Yes, genes confer an advantage, but do not know (and may never know) what combination of factors yield a dance genius. Parents will need to remember that they may be frustrated when their designer children become persons other than what they have planned. Education and counseling will be needed to help remedy the misplaced expectations of parents and their difficulty in coping with failure.

We also need to remember that the line between therapy and enhancement is blurry. Health is a continuum without a clearly defined stopping point. It is difficult to differentiate among treatment, prevention, and enhancement. We lack an objective definition of "normal." If we see a correctable condition, most of us want to do something about it. Thus, interventions now regarded as enhancements may in the future come to be viewed as therapeutic. If some day we correct the gene responsible for Alzheimer's disease, it may also be possible to enhance memory.

Parents contemplating the use of genetic engineering must ask themselves: What is "normal"? What is a disability (dwarfism)? What is a social problem (being short)? If genetic therapy gives us the capacity to change height and cure dwarfism, it seems unlikely that society will limit the therapy to a child to be in the first, fifth, or fiftieth percentile for height as an adult.

AN OPTIMISTIC LOOK TO THE FUTURE

We need not fatalistically accept whatever a child is born with by genetic mixing. In the past, a mother's and father's genetic contributions were random. Once an embryo was created, its genetic character was fixed.

I take a dynamic, not a static, view of our nature as humans. We are not fated by God to accept the present state of things. We can

change humans and their nature by technological means, providing a better life for our children.

In the future, Progressive Judaism, I suggest, ought to let parents decide what they think is "best"; what they regard as improvements of human traits or characteristics. Each of us has different definitions of "normal" health and desirable traits or characteristics. Many may want to design "perfect" offspring conforming to what they regard as societal norms, sociocultural priorities, or an economically "successful" genotype. These norms, however, will vary, thus limiting the imposition of harmful or skewed concepts of normality. Even if we follow a herdlike mentality, generally we may want to reduce aggression, stimulate friendliness, raise intelligence, and eliminate genetic differences leading to inequality. Most of us would agree, it seems to me, that at least these transformations do not represent the imposition of harmful concepts of "normality."

Genetic engineering represents an extension of God's continuing creative activity. We are partners with the Eternal in the transformative process of bringing the world to perfection. Partnering means taking an active role. As co-creators with God, we ought to have the opportunity to strive for excellence in our offspring by eliminating genetic diseases and enhancing our children, recognizing we are on the road to progress, not perfection. We ought to be able to free our children from the constraints of "natural" destiny.

Some day, we will be able to have children that are the products of our own design. Let people live longer, heal themselves, and give birth to children who have the best genes, the best chance for a longer and healthier life, are smarter, more successful, and perhaps even happier. Giving people more control over procreation, culminating in designing children, is not being Godlike. These techniques do not represent an improper tampering with the "natural" order.

We stand on the edge of engineering human evolution. In this

process, we can use technology for human benefit. By giving broad scope to personal autonomy and allowing as much choice as is safe and effective, genes, through therapy and enhancement, will become instruments of personal growth. With the ever greater human freedom to control our future genetic destiny, progressive Judaism ought to wholeheartedly embrace the possibilities of our biological future.

Notes

1. Immanuel Jakobovits, *Jewish Medical Ethics: A Comparative and Historical Study of the Jewish Religious Attitude to Medicine and Its Practice* (New York, Bloch, 1975), p. 266.
2. Genesis 11:1-9. Various interpretations are provided in *The Torah: A Modern Commentary*, W. Gunther Plaut (ed.) (New York, UAHC Press, 1981), pp. 83-84. The author of Proverbs (16:18) reminds us: "Pride leads to destruction...."
3. The scientific issues for somatic cell gene therapy are summarized in LeRoy Walters and Julie Gage Palmer, *The Ethics of Human Gene Therapy* (New York, 1997), pp. 17-36.
4. Scientific and technical background for germline therapy and its obstacles are provided in David B. Resnik, Holly B. Steinkraus, Pamela J. Langer, *Human Germline Gene Therapy: Scientific, Moral and Political Issues* (Austin, 1999, pp. 46-84 and Walters and Palmer, *The Ethics of Human Gene Therapy*, pp. 60-76.
5. Resnik, Steinkraus, Langer, *Human Germline Gene Therapy*, p. 95.
6. Genesis 2:17.
7. Psalm 115:16.
8. Rabbi Barry Freundel, "Judaism" in *On the New Frontiers of Genetics and Religion*, J. Robert Nelson (ed.) (Grand Rapids) 1994), p. 133.
9. Exodus 21:19.
10. B. Baba Kamma 85a.

11. Deuteronomy 22:2.
12. Central Conference of American Rabbis, Responsum 5761.7 "Human Stem Cell Research," fn. 6, available at <http://www.ccarnet.org/cgu-bin/respdisp.pl>.
13. Rosner, "Judaism, Genetic Screening and Genetic Therapy," *Mount Sinai Journal of Medicine*, October/November 1998, 65:5 and 6, 406-413, pp. 410-411. See also Fred Rosner, M.D., *Modern Medicine and Jewish Ethics* (Hoboken, 1991), pp. 188-189.
14. David Golinkin, "Does Jewish Law Permit Genetic Engineering on Humans?" *Moment*, August 1994, 19:4, 28-29, 67, p. 29. See also David M. Feldman, *Birth Control in Jewish Law: Marital Relations, Contraception, and Abortion As Set Forth in the Classic Texts of Jewish Law* (Northvale), p. 331.
15. Elliott N. Dorff, *Matters of Life and Death: A Jewish Approach to Modern Medical Ethics* (Philadelphia, 1998), p. 161.
16. Id., pp. 163-164.
17. Central Conference of American Rabbis, Responsum No. 154. "Jewish Involvement in Genetic Engineering" (1989), Walter Jacob, *Questions and Reform Jewish Answers: New American Reform Responsa* (New York, 1992), p. 252. The responsum notes that it "is not intended to discuss genetic engineering in human beings."
18. Freundel, "Judaism," pp. 125, 135. The ethical arguments in favor of and opposed to germline gene therapy are summarized by Walters and Palmer, *The Ethics of Human Gene Therapy*, pp. 80-89. See also Eric T. Juengst, "Germ-Line Gene Therapy: Back to Basics," *Journal of Medicine and Philosophy*, December 1991, 16:6, 587-592.
19. For a summary of anti-aging techniques and regenerative medicine procedures see S. Jay Olshanksy and Bruce A. Carnes, *The Quest for Immortality: Science at the Frontiers of Aging* (New York, 2001), pp. 150-167, 186-212. See also Gwen Kinkead, *The very Radical Business of Long Life and Eternal Youth* (Fort Worth, February 2002), pp. 63-69, 108.
20. Barry Freundel, "Gene Modification Technology," *Engineering the Human Germline: An Exploration of the Science and Ethics of Altering the Genes We Pass*

- to *Our Children*, Gregory Stock and John Campbell (ed.) (New York, 2000), p. 121.
- 21." See, e.g., Leon R. Kass, "L'Chaim and Its Limits: Why Not Immortality," *First Things*, May 2001, 113: 17-24.
22. Nicholas Wade, "Arguments Over Life and the Need for Death," *New York Times*, March 7, 2000, D4 (quoting Dr. Leon R. Kass).
23. Gregory Stock, *Redesigning Humans: Our Inevitable Genetic Future* (Boston, 2002), pp. 95-96.
24. The scientific issues pertaining to enhancement genetic engineering are summarized in Walters and Palmer, *The Ethics of Human Gene Therapy*, pp. 99-108.
25. Lee M. Silver, *Remaking Eden: How Genetic Engineering and Cloning Will Transform the American Family* (New York, 1998), p. 273. See also id., p. 297.
26. Azriel Rosenfeld, "Judaism and Gene Design," *Tradition*, Fall 1972, 13:2, 71-80, reprinted in *Jewish Bioethics*, Fred Rosner and J. David Bleich (ed.), Hoboken, 2000, p. 437.
27. Fred Rosner, "Genetic Engineering and Judaism," *Jewish Bioethics*, p. 451; Rosner, *Modern Medicine and Jewish Ethics* (New York, 1980), p. 188.
28. Freundel, "Judaism," pp. 124, 134.
29. Freundel, "Gene Modification Technology," pp. 120-121. Earlier, Rabbi Freundel expressed a more negative opinion of genetic enhancement stating: "...[F]undamental alternation of personality would seem to threaten destruction of the individual and would raise 'Brave New World' - style fears....[But] improvements of characteristics would raise doubts as to whether the individual was being done away with and whether certain types of people were being defined as undesirable." Freundel, "Judaism," p. 135.
30. B. Pes. 54a.
31. B. Hul. 7b.
32. Rosner, "Judaism, Genetic Screening and Genetic Therapy," pp. 411-412.

33. Golinkin, "Does Jewish Law Permit Genetic Engineering on Humans?," p. 29; The quotes in this paragraph are from Golinkin's article. Rabbi David M. Feldman in "Forum," *Moment*, June 1991, 16:2, 4, concludes the genetic enhancement technology is "interdicted for its own sake and for possible misuse." See also Feldman, *Birth Control in Jewish Law* (New York, 1968), p. 331. Earlier, Conservative Rabbi Lawrence Trester in, "Therapy or Engineering: Jewish Responses to Genetic Research," *The Reconstructionist*, April-May 1984, 49:6, 21-25, p. 21, concluded that the production of a blue-eyed child as a preference "is unwarranted."

34. Matt Ridley, *Genome: The Autobiography of a Species in 23 Chapters* (New York, 1999), pp. 297-299.

35. Central Conference of American Rabbis, Responsum 20. "Genetic Engineering," Walter Jacob, *Contemporary American Reform Responsa* (New York, 1987), p. 33. The golem concept is mentioned in the Babylonian Talmud (San. 65b). Byron L. Sherwin provides a helpful overview of the golem legends in a chapter "The Moral Implications of the Golem Legend" in his book *In Partnership with God: Contemporary Jewish Law and Ethics* (Syracuse, 1990).

36. In contrast, Rabbi Dorff sees genetic engineering and our creativity as turning "on us, to the point of imperiling our very existence." Dorff, *Matters of Life and Death*, p. 312.

37. CCAR Responsum 20. "Genetic Engineering," p. 34. See also Rabbi Michael J. Brode, "Genetically Engineering People: A Jewish Law Analysis of Personhood," *St. Thomas Law Review*, Summer 2001, 13: 4, 877-899, at 893.

38. Mark S. Frankel and Audrey R. Chapman, *Human Inheritable Genetic Modifications: Assessing Scientific, Ethical, Religious, and Policy Issues* (Washington, DC, 2000), pp. 8, 31-32, 35-40; Resnik, Steinkraus, Langer, *Human Germline Gene Therapy*, pp. 85-167; Walters and Palmer, *The Ethics of Human Gene Therapy*, pp. 108-133.

39. See, e.g., Frankel and Chapman, *Human Inheritable Genetic Modifications*, pp. 31-32, 39-40; Audrey R. Chapman, "Religious Perspectives on Human Germ Line Modifications," *Beyond Cloning: Religion and the Remaking of Humanity* (Harrisburg, 2001), pp. 72-74. Leon R. Kass comments negatively on the commodification of human life in "The Moral Meaning of Genetic Technology," *Commentary*, September 1999, 108:2, 32-38, p. 36.

40. Charles Murray, "Human Nature: Deeper into the Brain," *National Review*, January 24, 2000, 51:22, 46-49, p. 49.
41. For a journalistic account of gene alteration to achieve excellence in sports, see Jere Longman, "Someday Soon, Athletic Edge May Be from Altered Genes," *New York Times*, May 11, 2001, A1.
42. Stock, *Redesigning Humans*, p. 123.
43. *Ibid.*, p. 193.
44. See, e.g., Frankel and Chapman, *Human Inheritable Genetic Modifications*, pp. 36-39; Chapman, "Religious Perspectives," pp. 69-72; Maxwell Mehlman and Jeffrey R. Botkin, *Access to the Genome: The Challenge to Equality*, Washington, DC, 1998.
45. Silver, *Remaking Eden*, pp. 281-286. See also Lee M. Silver, "Reprogenetics: How It Will Change Our World," *Humanistic Judaism*, Autumn 1998, 26:4, 20-26, pp. 21-23.
46. Genesis 1:26-28, 5:1.
47. Freundel, "Judaism," p. 129.
48. The need to make the technology cheap and available for nearly everyone one may propel the use of artificial chromosomes, a package of "off-the shelf gene modules," rather than alter specific genes, thereby in all likelihood allowing inexpensive, mass genetic enhancement. Stock, *Redesigning Humans*, p. 186.
49. Francis Fukuyama, *Our Posthuman Future: Consequences of the Biotechnological Revolution* (New York, 2002), p. 158.
50. See, e.g., Frankel and Chapman, *Human Inheritable Genetic Modifications*, p. 38; Chapman, *Religious Perspectives*, p. 71.
51. Dorff, *Matters of Life and Death*, p. 317.
52. M. Ned. 9:4

53. Walters and Palmer, *The Ethics of Human Gene Therapy*, pp. 85, 112; Mario R. Capecchi, "Human Germline Gene Therapy," *Engineering the Human Germline*, pp. 38-41.
54. Stephen Jay Gould, "Message from a Mouse; It Takes More than Genes to Make a Smart Rodent, or High-IQ Humans," *Time*, September 13, 1999, 154:11, p. 62.