SPRINGER BRIEFS IN PHILOSOPHY

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Transhumanism and Society

The Social Debate over Human Enhancement

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Chapter 2
Transcend or Transgress?

Certain passages from C. Wright Mills' *The Sociological Imagination* [(1959) 1969] inspire me today as they did when I happened upon my first sociology course many years ago. In the first chapter, *The Promise*, Mills identifies three sets of questions posed by the classic social theorists such as Karl Marx and Max Weber. It is the third set, especially, that I find most insightful:

> What varieties of men and women now prevail in this society and in this period? And what varieties are coming to prevail? In what ways are they selected and formed, liberated and repressed, made sensitive and blunted? What kinds of 'human nature' are revealed in the conduct and character we observe in this society in this period? And what is the meaning for 'human nature' of each and every feature of the society we are examining?

Underlying these questions are three premises:

- Subject and social world (or biography and history, as Mills puts it) are interrelated.
- Human nature is flexible.
- What prevails today, systems and subjects, will not prevail in the future.

Karl Marx studied the capitalist system with concern for worker alienation and class conflict. Max Weber wrote about rational management and social control. The contestants in the transhumanity debate are from diverse backgrounds and on a number of issues they do not see eye to eye, nevertheless, like Marx and Weber all accept the premise that the human subject is influenced by social/technological forces. It is obvious that the transhumanists see human nature as changeable, but the conservationists' call for preserving it belies a similar attitude. Arm-chair philosophers? Hardly. They, too, are activists and are engaged in this debate because for them the future of humanity is at stake.

In an article published in *Christianity Today*, entitled "The Techno Sapiens Are Coming," C. Christopher Hook (2004:36) begins by warning, "When God fashioned man and woman, he called his creation very good. Transhumanists say that, by manipulating our bodies with microscopic tools, we can do better. Are we ready for the great debate?" After identifying a few transhumanists and quoting their

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more dramatic lines (such as "biology is not destiny…chips are destiny" and "the age of the human is drawing to a close"), he asks and answers the rhetorical question, "Are these ideas the musings of a small band of harmless techno geeks? Unfortunately not."

Leon Kass describes transhumanists as a social movement vanguard :

> In leading laboratories, academic and industrial, new creators are confidently amassing their powers and quietly honing their skills, while on the street their evangelists are zealously prophesying a posthuman future. For anyone who cares about preserving our humanity, the time has come to pay attention (2002:4).

We should question this particular rhetorical strategy and not assume commensurability between researchers and transhumanists. For the most part scientists and engineers are involved with what Thomas Kuhn (1962) calls "normal science," that is, contributing incrementally to established lines of research. They are busy with the day-in and day-out routines of administering projects, running labs, and securing grants. Funding is more readily available for research related to the detection, understanding, and treatment of pathologies and, understandably, researchers often present their work and findings in terms of potential therapies (not enhancements). With some notable exceptions, for instance James Watson, most are not flamboyant and are far too prudent to make political waves.

Furthermore, although it is tempting to cast scientists and engineers as Dr. Frankensteins, some researchers have found that experts, as compared to non-experts, are not more likely to throw caution to the wind. For example, Isaac Rabino (2003) found that human genetics researchers had similar attitudes about genetic testing as that of the general public with regard to supporting paternalism when dealing with the test results of children, favoring voluntary testing over compulsory testing, and opposing disclosure to insurers and employers. Lennart Sjöberg (2002) found that experts and non-experts, alike, worry about tampering with nature and novel risks.

Whether or not scientists and engineers favor engineered transcendence is debatable, but we know for sure that the transhumanists *explicitly* propose it. They are the visionaries. This is evident right from the start with Julian Huxley's coining of the term transhumanism:

> The human species can, if it wishes, transcend itself—not just sporadically, an individual here in one way, an individual there in another way, but in its entirety, as humanity. We need a name for this new belief. Perhaps *transhumanism* will serve: man remaining man, but transcending himself, by realizing new possibilities of and for his human nature (1957:17).

Transcendence: Cosmic, Personal and *Civitas*

Diversity exists in any movement so it should come as no surprise that there are different versions of transcendence espoused by transhumanists. I will present three versions: cosmic, personal, and *civitas*. I will present each according to its

expression by a prominent figure in the transhumanist movement, however I want to make clear that with selective sampling and refinement I am actually proposing ideal types. Following that, I will present the conservationists' rebuttal to claims of transcendence: that radical bio-social change will bring about fatal transgression.

Cosmic Transcendence

Of the bizarre states that cosmologists describe, the singularity is striking. It is posited to be a feature of a black hole, which itself is a *very* strange phenomenon. A black hole is born when a collapsed star forms a region of space with an extraordinarily intense gravitational field. Under such conditions, all matter flows through a single point, or singularity. The initial state of the universe, prior to the Big Bang, is also described as a singularity. Laws of time and space do not operate within a singularity. Ray Kurzweil used this concept as a key metaphor and title for his 2005 book, *The Singularity Is Near: When Humans Transcend Biology*, to characterize a point in the future when socio-technological change will be beyond anything we have ever known and standard theories of human development will fail. He predicts that breakthroughs in one cutting-edge field, for example, neuroscience, genetics, robotics, and computer science, will spur innovations in the other fields. Convergence will help produce exponential growth in the *rate of change* that will make Alvin Toffler's future shock look like a stroll in the park.

Physicists explain that matter passing through the singularity of a black hole is dramatically affected. In Kurzweil's model, as humans pass through the technological singularity an accelerating evolutionary process working on intelligence will yield new beings. He makes it clear that there will be as little in common between posthumans with evolved intelligence and standard humans as there is between bacteria and Homo sapiens. He predicts that these super beings will harness stars and eventually operate on the scale of the universe or universes. Generations of humans that forego this evolution, in comparison, will be hopelessly primitive.

In the social sciences it has been pointed out that grand theories, such as Herbert Spencer's social evolution theory, lose sight of human actors. Kurzweil's evolutionary theory is even more sweeping than Spencer's, suggesting stages of civilization freed of bodily *and* earthly constraints. With cosmic transcendence, human actors recede as anachronisms.

Personal Transcendence

Max More, in promoting an actor-oriented approach to transhumanity, has openly expressed impatience with epic scales, and has targeted the singularity for scorn:

> The Singularity idea has worried me for years—it's a classic religious, Christian-style, end-of-the-world concept that appeals to peoples in Western cultures deeply. It's also mostly nonsense…The Singularity concept has all the earmarks of an idea that can lead to cultishness, and passivity. There's a tremendous amount of hard work to be done, and intellectually masturbating about a supposed Singularity is not going to get us anywhere (quoted in Hughes 2004:173).

For more, transcendence is primarily a personal experience, a process of self-transformation. This is best expressed in his *Principles of Extropy* (2003) which he crafted while serving as chairman of the Extropy Institute. In defiance of entropy as experienced by individuals as disease and decline, he recommends the bold application of enhancement technologies for *extropy*: "seeking more intelligence, wisdom, and effectiveness, an open-ended lifespan." (2003) Essential to transcendence is one's will to advance and one's intolerance for passivity. One must embrace rational thinking over faith that constrains and one should challenge traditional notions of human limitations. Believing in perpetual progress and being proactive and optimistic vis-à-vis science and technology leads one "creatively and courageously to transcend "natural" but harmful, confining qualities derived from our biological heritage, culture, and environment." (2003) He values an open society through which individuals may self-direct and voluntarily cooperate to secure advantages.

More [(2000) 2006] finds in Friedrich Nietzsche's overman a prototype for transhumans. He quotes this passage from *Zarathustra* II: "And life itself confided this secret to me: "Behold," it said, "I am *that which must always overcome itself*. Indeed, you call it a will to procreate or a drive to an end, to something higher, farther, more manifold: but all this is one…Rather would I perish than foreswear this…"

In calls for moratoriums or for the relinquishment of advanced technologies, More sees stagnation. In the bold self-application of enhancement technologies he sees, instead, a great opportunity to engage the creative spirit of the overman.

Civitas Transcendence

James Hughes, a former secretary of the World Transhumanist Association, offers a vision of transhumanity in his book, *Citizen Cyborg* (2004), which is meant to be consistent with secular humanism and the Enlightenment project of using science and technology for the collective good. His training as a sociologist shows through with his attention to social and political systems. He advocates improvements to minimize social injustice, promote social solidarity, and safeguard human populations. Like Max More, he finds cosmic transcendence so abstract and future distant to be a distraction for immediate concerns, but he also finds fault with the libertarian streak of the extropians. Hughes distrusts the free market, opposes unchecked individualism, and believes that a safe passage to a transhuman civilization requires ethical standards, public oversight, and some regulation.

I use the Latin term, *civitas,* which denotes citizenship and also planned settlement, to describe Hughes' vision of transcendence. He foresees the progression to a more just, equitable, prosperous, and peaceful world through democracies that encourage citizens to utilize safe and effective enhancements. Because they are augmented by biotech, nanotech, and neurotech, *cyborg citizens* will be more capable and energetic citizens and be able to contribute more to community and society. A virtuous spiral develops such that as enhanced citizens become more socially productive, societal goods increase, as more individuals share in this bounty, their quality of life increases and, in turn, they contribute more to the common good.

As a way to promote egalitarianism, Hughes proposes social welfare programs designed to assist those who can't afford enhancements. He also agrees with a policy recommendation by Nick Bostrom (2005) that "positional enhancements" that benefit an individual at the expense of others should be discouraged or banned. Hughes is quite aware of how the counter tendencies of selfishness/altruism, self-centeredness/empathy, and conflict/cooperation can be influenced by social institutions, social groups and culture. However, he also entertains the possibility that these tendencies are rooted in biology. He favors Mark Walker's suggestion that more research be conducted "identifying the genes and neurochemical necessary for empathy and cooperation, encouraging noncoercive screening and therapy to ensure that all citizens have them, and giving incentives for people to select for them in children and amplify them in themselves" (251).

To the extent that this policy is aimed at shaping the human population, he is recommending a form of eugenics. Hughes, however, distinguishes this policy from discredited totalitarian practices in that it is voluntary and is not motivated by prejudice. It is meant to achieve a greater good, namely, to develop cyborg citizens better suited for democracy. Whereas Kurzweil values science and technologies for the lift that they might provide for superior intelligences, and More values these as resources for the overman, I see Hughes following Saint-Simon and Auguste Comte and embracing science and technology for the purpose of social engineering. Granted, he would not have this done in a heavy handed way and he defers to "cognitive liberty," nevertheless he imagines a transhuman future in which "pro-social feelings" are a requirement for public service employment and all are under an "ethical obligation… to enhance ourselves, to become better people and use our powers to do good" (256).

Compromise between Versions

In my account above, I note contested points between the three models of transcendence. However, it is possible to reduce tension if certain accommodations are made. For example, those attracted by personal transcendence could imagine cosmic transcendence taking place at time well after an initial phase of recognizable self-transformation. The sticking point is over the expected or desirable rate of change.

The libertarian streak in personal transcendence can be muted a bit by social pragmatism. Hughes makes the case that without public support transhuman technologies will be delayed or banned, and the public will accept enhancement technology only if it is safe, broadly available, and democratically accountable. Seen this way, self-interest in transcendence will depend on accommodating collective goals. Max More (2005) appears to concede this point in a policy position paper in which he recommends a "proactionary principle" that retains the freedom to innovate but adds, for example, openness/transparency: "Take into account the interests of all potentially affected parties, and keep the process open to input from those parties."

Transgression

Regardless of the version espoused, transhumanists envision a progressive series of technological innovations and enhancements with every new stage of transhumanity being better than the last. In contrast, conservationists warn of transgression, or a point of no return from which humanity will suffer a most grievous, irretrievable loss. Although conservationists may not make a distinction between the three versions of transcendence, I have distilled the respective critiques and present them below.

Critique of Cosmic Transcendence

Max More is not alone in his accusation that Kurzweil's singularity is a high-tech version of Christian eschatology. Conservationists also see in cosmic transcendence a quasi-religious theme that contradicts the ostensibly secular, scientific basis of Kurzweil's work. To explain the comparison, it might help to contrast Pierre Teilhard de Chardin's vision of the Omega Point with more militant versions of Christian eschatology.

John, in the Book of Revelation (New Testament), reports a vision of divine intervention and judgment, with Jesus Christ returning to earth to save the righteous and vanquish satanic forces. Countless times throughout the centuries, Christian groups have anticipated Armageddon. More recently, Jerry Jenkins and Tim LaHaye, have popularized this scenario with their *Left Behind* series, which by 2008 had sales surpassing 65 million copies. Pierre Teilhard de Chardin's vision is very different. He believed that all elements of the universe are imbued with spirit and are involved in an evolution of consciousness. Human beings represent an important stage in this development because of their self-consciousness. He expected ever higher levels of consciousness will emerge out of increasingly complex human-world interactions and eventually the Omega Point of supreme consciousness will be reached. Far different from the anthropomorphic

warrior and judge of Revelation, Jesus Christ/God is imagined by Teilhard as an elemental, universal force behind the evolution of consciousness, drawing humanity closer through ever-more complex manifestations.

There are significant similarities between Kurzweil's vision of the future and Teilhard's eschatology including an emphasis on consciousness, an evolutionary theory that provides for superorganisms (emergence of complexity from more basic forms), an exceptional role for humanity but also its superannuation, and the culmination in universe consciousness. The differences, however, should also be noted. Pierre Teilhard de Chardin describes consciousness in terms of spirit whereas Ray Kurzweil emphasizes information, computation, and intelligence. He and other transhumanists describe the evolutionary process in secular terms, for example, natural selection, Moore's Law of exponential increases in processing power, and technological innovation, so that there is no need to introduce divine agency.

Kurzweil doesn't consider singularitarianism to be a religion, although he acknowledges that it provides "new perspectives on the issues that traditional religions have attempted to address: the nature of mortality and immortality, the purpose of our lives, and intelligence in the universe" (2005: 370). He speculates about the divine with respect to the saturation of the universe with intelligence, but he treats it as an open question whether posthumans with god-like powers will find an eternal God.

Critics operating from faith traditions charge that Kurzweil's model of cosmic transcendence lacks an accounting of God's involvement with individuals and humankind. They take exception to the elevation of science and technology as the agents of history. Michael DeLashmutt (2006) writes: "Though a posthuman eschatology wrestles with similar themes present within Christian eschatology, a Christian eschatology is ever aware that the fulfillment of its hope lies in the hands of the God who is in control of history, in contrast to a posthuman eschatology that places the onus of control upon human technologies." In the encyclical, *Spe Salvi,* Benedict XVI asserts that

> Francis Bacon and those who followed in the intellectual current of modernity that he inspired were wrong to believe that man would be redeemed through science. Such an expectation asks too much of science; this kind of hope is deceptive. Science can contribute greatly to making the world and mankind more human. Yet it can also destroy mankind and the world unless it is steered by forces that lie outside it… It is not science that redeems man: man is redeemed by love…If this absolute love exists, with its absolute certainty, then—only then—is man "redeemed", whatever should happen to him in his particular circumstances (2006:26–27).

Elaine Graham (2003) warns of "hyper-humanism":

> Such talk of humanity as in some degree self-constituting via its own technologies, of being capable of influencing the course of its own development is to fall prey to what we might term 'hyper-humanism': a distortion of modernity's faith in the benevolence of human reason, producing the hubristic belief that humanity alone is in control of history (2006).

She believes that humility before God and creation is especially necessary in the near future as more and more powerful technologies become available. With humility comes caution, reflection, and prudence. This disposition may prevent catastrophes. Bronislaw Szerszynski (2006) fears that technologies misconstrued as angels for humanity may become demonic: "the irony is that the denial that technologies belong to God seems ultimately to give them not to us, but to *themselves*—to render them demonic, and to place humanity under their thrall." Alan Padgett (2005) is pessimistic as well:

> The dream of a happy and harmonious techno-secular future is based on false hopes in infinite energy, infinite human potential, infinite human progress, and complete human good will. Such a techno-secular dream, even if it comes about, will self-destruct after a few centuries, inevitably smashing on the rocks of our finitude and sin.

Transgression is imagined within a Judeo-Christian tradition that, as with the stories of Adam & Eve's original sin, the Golden Calf, and Tower of Babel, warns not to put humanity or its creations above God. Pride goes before destruction (Proverbs 16:18).

Whereas these critics see problems with transhumanism being insufficiently attuned to divine grace and God's plan, secular critics find fault with it for being too influenced by Christian eschatology. David Noble, in particular, has advanced the thesis that Western science and technology were inspired by Christian millennialism and these institutions remain essentially religious endeavors directed today by men motivated by a quest for transcendence. According to Noble, the intellectual movement began in Europe in the Middle Ages among monastic orders such as the Benedictans and Franciscans with Erigena, Roger Bacon, and Francis Bacon, among others, calling for the development of technologies to better achieve these religious goals: (1) to recover the powers of dominion that had been lost with the Fall of Adam, (2) to allow man to better appreciate his likeness to God the Creator, and (3) to use the powers to wage a successful campaign (deemed imminent) against the Antichrist and his forces. Noble asserts that Newton, Boyle, Priestly, Faraday, Maxwell, Babbage and many other notable scientists and technologists were believers and, in the nineteenth and twentieth centuries, the fields of nuclear physics, space exploration, artificial intelligence, artificial life, and genetics were launched by men inspired by Christian eschatology. Allegedly, religious and non-religious scientists and engineers in these fields today continue to be obsessed with the quest for perfection: "Often displaying a pathological dissatisfaction with, and deprecation of, the human condition, they are taking flight from the world, pointing us away from the earth, the flesh, the familiar" (1999:208).

In summary, critics of cosmic transcendence may disagree whether the roots are Christian or humanist, nevertheless they find fault with its techno-utopianism and its impatience for human limitations. Noble's recommendation: "disabuse ourselves of the other-worldly dreams that lie at the heart of our technological enterprise, in order to begin to redirect our astonishing capabilities toward more worldly and humane ends" (6).

Critique of Personal Transcendence

Critics often accuse transhumanism of promoting excessive individualism. This charge, however, somewhat misses the mark with cosmic transcendence, nor does it apply to social-political transcendence with its communitarian leanings. The apt target is personal transcendence.

As described previously, More's account of personal transcendence is fashioned after Nietzche's overman, but of course there are other possible models, for example, the "self-made" entrepreneur and the conquering heroes of antiquity such as Alexander the Great and Julius Caesar. As with these other models, personal transcendence makes the self the overriding project of one's existence and as such it requires a significant preoccupation—how to best utilize resources, how to maximize potential, etc.

According to religious critics, as self-absorption increases there is a corresponding decrease in the tendency to enter into rich reciprocal relationships with others, especially if self-sacrifice is required. There is also a tendency to treat one's environment in terms of use value. What if God is encountered through a reverence of creation and through "I-Thou" relationships (Martin Buber's term), as many theologians assert? What if self-abnegation is necessary to open oneself to the divine? William Schweiker (2003) asserts that "The daring task about speaking about the divine aims to articulate realms of value beyond human preference and power. And it seeks also to evoke a love of life rooted in the reality of the living God."

For many believers in the Abrahamic faiths, human nature is God-given (according to Genesis), passed down securely through generations, and designed for a higher purpose, for example to be endured as a pre-condition for God's grace and redemption or, more optimistically, embraced– bearing the likeness of God allows for a meaningful relationship with the divine. John Jefferson Davis asserts that

> All of God's creation, including the human body, is *good* (Gen. 1:31; Tim. 4:4) and as such is worthy of care and respect. Human beings occupy a unique place in creation, being made in the image and likeness of God (Gen. 1:26), and consequently human life has sacred value and is to be accorded the greatest care and protection…(70).

In this light, enhancements pose a serious threat. Mark Hanson (1999) writes that "[w]ithin a Protestant understanding of our nature, the disvalue occasioned by enhancements might consist… in the loss of recognition of the providence of God working through the contingencies and weaknesses of our human form."

There is a sense of daring and excitement associated with personal transcendence. The self is emboldened, tested, and augmented through enhancements. Those who question this process must advise, instead, self-restraint and self-sacrifice. I imagine that this is not an easy task. Individuals must be persuaded to believe in an apparent paradox, that something is gained through selflessness and something is lost through self-fulfillment. It requires, most of all, relying on a model of character development that Leon Kass, for one, admits is a bit old school.

The four cardinal virtues from Greek philosophy are prudence, temperance, fortitude, and justice. Islam recognizes those, as well as, righteousness, respect, sincerity, and honesty. Christianity adds faith, hope, charity, and love. Buddhism's Divine States are loving kindness, compassion, altruistic joy, and equanimity. Practicing these virtues requires self-restraint and generosity towards others. Vices, for example, pride, avarice, and gluttony are typically described as manifestations of selfishness. Although the following is a very simplified formula, excellence of character or proper living is said to be achieved through practicing virtue (which is self-effacing) and avoiding vice (selfishness).

Is personal transcendence consistent with this formula? "No," assert the critics of transhumanity. It is egotistical, too grasping, and may result in new forms of injustice. Living a good life accepting of human mortality, on the other hand, has intrinsic value and it helps promote the greater good. Worried about overpopulation that may occur with elongated life spans and increased demands placed on natural systems, Bill McKibben sees finite living as the choice consistent with conservationism.

Transhumanists treat death and decline as major impediments to overcome. Simon Young (2006) bluntly states, "Death is, to me, an obscenity" (15) and he refers to illness, disability, and senescence as "biological slavery" (41) One's existence, in his view, takes place only within life's frame. There is no afterlife. Conquering death is a way to extend life's frame. In terms of the overman, moreover, the will is strengthened through death's conquest.

Clearly, this understanding of and approach to death is at odds with that of most religions. Rather than treat it as the tragic end of the person, death is understood as a passageway to a better state of existence—the absence of suffering, peaceful co-existence with others, a more perfect union with the divine. John Paul II (1981) relates suffering and death in terms of Jesus' crucifixion. By accepting these, as did Jesus, we also "carry the cross." This is an act of homage as well as a vital exercise in one's spiritual development.

Bill McKibben explicitly rejects the transhumanist premise that increased longevity is a necessary condition for self-fulfillment. He argues that the standard human lifespan is sufficient time to lead a fulfilling life, and that finitude actually makes life more precious. Life extension and enhancements will dilute human experience and undermine character development as individuals will dodge true adversity. Personal accomplishments will ring hollow for the enhanced. According to McKibben, the "grander questions" regarding human existence "can only be usefully answered by people, whose bodies eventually start to sag, by people who love and who grieve and who celebrate, by people who mourn and who know that they will someday die" (2003:226).

Critique of Civitas Transcendence

James Hughes charges that "Left bioLuddites" have turned away from their roots in the Enlightenment: "They have given up on the idea of progress guided by human reason, and, afraid of the radical choices and diversity of a transhuman future, are reasserting mystical theories of natural law and order" (2004: xiii). Conservationists counter that engineered transcendence will backfire and undermine the humanist project.

Martin Heidegger [(1954) 2003] alleged that with modern technology there is a particular revealing and ordering of being that treats people as a "standing-reserve" to be exploited. In his *Case against Perfection*, Michael Sandel warns that enhancement engineering also entails a disposition of mastery that works against the Enlightenment ideal of liberty: "willfulness over giftedness, of dominion over reverence, of molding over beholding" (2007:85). The social theorist, Jurgen Habermas (2003), is particularly concerned with preimplantation genetic diagnosis (PGD) and biotechnologies that allow for the selection or modification of a child's genes. Habermas warns that a designed child will not be an autonomous agent and will not be perceived as such.

Can a child have true autonomy if parents genetically design his or her capacities and proclivities? Maureen Junker-Kenney believes the answer is no:

> Genetic enhancement exemplifies a total reversal of the preconditions for autonomy: The offer of pre-implantation enhancement and selection constitutes the victory of parents' projections over the otherness of the child. In co-creating the specificities of its reality—sex, bodily features, character predispositions—it is being denied the singularity that is based on an unmanipulated originality (2005:12).

She asserts that the parent that designs his or her child would gain unprecedented influence over the child. Habermas writes that from the child's perspective, this is "permanent dependence" and "[f]or this poor soul there are only two alternatives, fatalism and resentment" (2003:14).

The questionable legal and moral standing of designed humans raises this dilemma for the polis: If granted citizenship these individuals may not be trusted as jurists, voters, and public officials but if denied political rights the promise of inclusion will be denied. Modern states operate pluralistically by recognizing human commonality. Although Hughes believes that this system can accommodate transhumans, Habermas insists that it cannot.

Francis Fukuyama claims that time and time again regimes have attempted to control subjects through systematic social control mechanisms only to be thwarted in the long run by unruly human nature. He asserts that there are "natural desires, purposes, traits, and behaviors [that] fit together into a human whole" (2002:12) and that these "deeply rooted natural instincts and patterns of behavior reassert themselves to undermine the social engineer's best-laid plans" (2002). In effect, human nature stymies tyranny. Accordingly, tampering with human nature is very risky: "Human nature shapes and constrains the possible kinds of political regimes, so a technology powerful enough to reshape what we are will have

possibly malign consequences for liberal democracy and the nature of politics itself" (7).

He treats Aldous Huxley's *Brave New World* [(1932) 1969] as a cautionary tale. In that imagined world the state utilizes reproduction and gestation conditioning technologies to produce biological castes that provide the foundation for a very successful rigid social stratification system. Even if enhancement technologies are not dictated by the state but driven by consumer choice and the free market, Fukuyama worries that social inequality will increase and future rulers with superior enhancements will maintain insurmountable advantages over the ruled. Social and political mobility, so important to liberal democracy, will be restricted.

Conservationists reject Hughes' recommendation to use transtechnologies to help individuals become better citizens. Bio-social engineering, however well-intentioned initially, will eventually be used by the powerful to perfect domination. The critics of *civitas* transcendence take a position similar to Bill McKibben—don't risk this venture when what we have is good enough.

Transcendence nor Transgression?

In closing, I believe that the transhumanists and the conservationists do us a service by imagining the fate of subjects in a transtechnological world. Later in this book I'll introduce the debate over specific risks, but this frank exchange about the future of humanity is most satisfying in light of C. Wright Mills' questions. Nevertheless, we might consider the possibility that neither transcendence nor transgression will occur. Imagined futures need not diverge so much between the utopian and dystopian. A consistent skeptic would likely agree with Dan Quisenberry, the famous baseball pitcher, when he said, "The future is much like the present, only longer." New sociotechnical ensembles may emerge that are muddled and mixed. Perhaps it is not ascension or fall that we can expect, but continued struggle.

Chapter 3
Transformation of Body and Mind

Similar to exploring an old city I like to wander down the side streets of the transhumanity debate to read about fascinating areas of research and development such as artificial intelligence and artificial life. However, it's best not to get sidetracked. It helps to keep in mind that the debate is driven by basic concerns as much as it is by the science and technology. In particular, I am reminded of this by the personal revelations by authors. One scholar wonders whether he would remain consistent with his opposition to genetic engineering if his grandchild's life was in the balance. Another author relates his grief over the death of his parents. Others describe a chronic illness that they or loved ones must suffer and endure. These testimonials serve to remind me that the transhumanity debate is centered on the problem of human mortality.

The transhumanists are not the first to propose a way out of the problem, after all, most religions do this. It is the method they suggest that is controversial. They propose a solution in this life rather than in the hereafter. They pose a bold, rhetorical question: If the very constitution of the human body is what makes us and our loved ones susceptible to disease, decline, and death, why not transform it? In the past there was no reason to expect that such a thing could be done. Now there is.

A good deal of transhumanist writing describes how cutting-edge technologies may be used for transformation. I'm sure that this can be perceived as smart marketing—to persuade potential "customers" and investors of the feasibility of this venture. It is also a way for the particular writer to present his or her preference for a specific posthuman form or to criticize the model proposed by a peer. Some transhumanists favor a dramatic departure from human biology. I'll refer to this as radical transformation. Others recommend modest transformation which would entail retaining the basic human form albeit with augmentations.

Transhumanists are criticized for elevating consciousness over embodiment, but also for being too focused on the material basis of human existence. For anyone who has tried to get a handle on the debate, this can be quite confusing. Which is it? Both critiques make sense if we understand that the first is meant as an indictment of radical transformation and the second of modest transformation. I'll present the debate over radical transformation first.

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Radical Transformation

To possess ever greater powers while leaving the frail body behind is an audacious idea often attributed to mainstream religions or to cults. Faith in the intercession of a benevolent God is usually, but not always, a prerequisite. For instance, members of Heaven's Gate believed that the Earth was to be cleansed by extraterrestrials, whose presence in our solar system allegedly was hidden by the comet Hale-Bopp. By releasing their spirits into the protection of these aliens, they expected to enter the Next Level of existence. Members of The Raëlian Church, as well, believe in extraterrestrials as benefactors and the Church holds that a person's existence is extendable through cloning.

Transhumanists *disassociate* their movement from religions and cults. They make it clear that they do not appeal to supernatural forces (or aliens). In some ways this makes building a case for their audacious idea that much harder. Transhumanists *associate* their movement with science and engineering and therefore must abide by scientific-secular norms of persuasion. It is true that much of their work is speculative, imagining developments ten, twenty, or fifty years hence. Still, they provide plausible accounts of how to get there from here utilizing the language of science and engineering. Some of their predictions for technological innovations are near term and will soon be subject to verification. Overall, their methodology is similar to that practiced in the interdisciplinary field of future studies.

There is no way to prove that society and technology will proceed exactly along the lines predicted. Fortunately for the transhumanists, they do well simply by having others accept the possibility that the project is technically feasible. For example, the development of an efficient interface between brains and computers is a crucial step for radical transformation. There may be a dozen different approaches under construction or imagined, and although many will fail, it only takes one to produce the breakthrough. The transhumanists simply make the case that the odds are in their favor.

Mind over Body

We often refer to "mind" and "body" when describing the way we feel, for instance, my body aches after a grueling workout and my mind is tired from too much studying. The distinction between mind and body invites an interesting question, "What is the relationship between the two?" I've heard more than once from older relatives that their minds have remained relatively young but their bodies have aged. This places an emphasis on difference or independence between mind and body. When I hit an impasse in my writing, I hike on nearby nature trails to refresh my mind. This assumes a vital interconnection or interdependence.

Professionals who study this mind-body duality similarly can pursue the independence or interdependence interpretations. In January 2008, Miguel A. L. Nicolelis, a

neuroscientist at Duke University, provided a startling demonstration of independence that suggests that the mind can bypass the body. Every scientific experiment has production pieces and these are the key ones in this demonstration: a monkey (named Idoya, in North Carolina), behavioral training, implanted electrodes, a treadmill, a 200-pound, 5-foot humanoid robot (named CB, in Japan), a signal relay system using computer and transmission technologies, and a movie screen. This is how Sandra Blakeslee (2008), the New York Times science correspondent, described the event:

> As Idoya's brain signals streamed into CB's actuators, her job was to make the robot walk steadily via her own brain activity. She could see the back of CB's legs on an enormous movie screen in front of her treadmill and received treats if she could make the robot's joints move in synchrony with her own leg movements. As Idoya walked, CB walked at exactly the same pace. Recordings from Idoya's brain revealed that her neurons fired each time she took a step and each time the robot took a step…
>
> An hour into the experiment, the researchers pulled a trick on Idoya. They stopped her treadmill. Everyone held their breath. What would Idoya do? "Her eyes remained focused like crazy on CB's legs," Dr. Nicolelis said. She got treats galore. The robot kept walking. And the researchers were jubilant.

Idoya's accomplishment is taken as proof of concept that the mind (or brain), suitably connected, can direct devices. The demonstration also succeeds by persuading the audience to consider Idoya's body (walking on the treadmill) and CB's body (also walking on a treadmill) as interchangeable objects under her mind's control. Research in brain machine interface has relevance for individuals who have suffered amputation or spinal injury, with work underway on how to allow human subjects to operate an artificial limb or exoskeleton by thought. Here again the mind is understood to be the active and independent agent.

Individuals who wish for restoration of mobility can find hope in Miguel Nicolelis' statement that "The body does not have a monopoly for enacting the desires of the brain." (Blakeslee 2008) Many transhumanists also take heart in new possibilities emerging from the confluence of neuroscience, computing, and robotics. They readily conceptualize the human body as one substrate for the mind, dispensable once better replacements are engineered. Prosthetic limbs, artificial hips and knees, cochlear implants, and pace makers are standard medical devices. Artificial bone, tendon, muscle, skin, blood, etc., are commercially available or are being developed. Each component may be seen as just one exception to an otherwise natural form, however taken together one is left with the impression that the organic body is replaceable. At the very least, it makes you wonder, "What is so special about human biology?"

The research described above imagined along the lines of science fiction characters such as the bionic man, bionic woman, and Robocop suggest that human biology is not so special and that a synthetic body would do just fine. Consider for the moment the alleged advantages: It would be more durable and not prone to disease and senescence and it could be upgraded as the technology improves. It would allow for more power, agility, and functionality. If the organic brain is seen as a limiting factor, "uploading" or copying the mind to a more promising medium would be the next step. That level of technological prowess, if

ever reached, opens up even more radical options such as digitizing the mind to allow existence in virtual worlds, thereby leaving behind human biology altogether.

Of Substrates and Cyborgs

What understanding of you and I—of human subjectivity—allows for the assumption that the human body is a nonessential element to one's being? Let's start with Andy Clark's portrayal of humans as "natural-born cyborgs." The term "cyborg," an abbreviation for cybernetic organism, denotes an entity part biological and part machine. Manfred Clynes and Nathan Kline (1960) first used the term to describe an astronaut capable of surviving a lengthy period of time in space: built-in monitors and drug infusers, artificial lungs, etc. Clark, a cognitive scientist, asserts that humans have always been cyborgs, in the sense of incorporating our best creations as a way to extend our reach. He identifies "cognitive hybridization" as the quintessential feature of our humanity:

> [I]t is our special character, as human beings, to be forever driven to create, co-opt, annex, and exploit nonbiological props and scaffoldings. We have been designed, by Mother Nature, to exploit deep neural plasticity in order to become one with our best and most reliable tools. Minds like ours were made for mergers. Tools R-Us, and always have been (2003:7).

Some of the props and scaffolds that the mind utilizes for expansion include older technologies, for instance, paper and pen, and newer technologies, for example, computers. Think of Google and the extension it provides for our inquisitive mind or the Nature or Discovery channels on television.

A trek through the Amazon basin would be arduous to say the least, but by watching a documentary on the rainforest you can get a sense of the environment without leaving your home. Watching a documentary is not the same as being there, although the difference will diminish with new simulation mediums. Consider what Miguel Nicolelis and his team had Idayo do. My children do something similar when they play Nintendo's Wii game system. They move a character through an environment on the screen and through audio, visual, and force feedback become, to a certain extent, the character within the environment. Technologists are working on improving haptics and telepresence. If reality simulation, rather than game play, is the goal this is how it might work: The explorer at home wearing specialized gear remotely controls an agile robot through the rainforest in a fashion similar to NASA engineers piloting the Mars Rover. Even better than the Rover, the robot returns a rich stream of sensory information (audio, visual, as well as tactile, olfactory, etc.) to be experienced by the tele-traveler. The not-too-intrepid explorer feels immersed in the environment.

In terms of exploring harsh terrains, the body may be an encumbrance or a liability. It certainly is impractical for exploration of the deep sea, volcanoes, and

other planets. According to Clark, we find the "good old-fashioned skin-bag," as he refers to the body, too restrictive for even ordinary purposes such as talking to family and friends over distance. We utilize communication mediums all the time to project our voice. Andy Clark treats the body like any other prop or scaffold. He implies that the genome-governed components that continue to serve the mind in important capacities in the environments that we explore and construct will be retained while others will be replaced or augmented by new props. The body has no special dispensation from techno-cultural selection pressures.

Kevin Warwick, a self-described cybernetic pioneer, has used his own body as a site for cyborg experimentation. With implants connected to nervous fibers in his left arm and a radio transmitter/receiver sending signals from his nervous system to a computer he operated a robotic arm and exchanged electrical signals with his wife (similarly equipped). Brain implants would be so much more powerful. (They have been tested on individuals suffering severe hearing loss or paralysis but the surgical procedure is risky.) Warwick welcomes the therapeutic applications but he also imagines posthuman capabilities:

> At present our method of communication, speech, is very slow, serial and error prone. The potential to communicate by means of thought signals alone is a very exciting one. We will probably have to learn how to communicate well in this way though, in particular how to send ideas to one another. It is not clear if I think about an ice cream are my thoughts roughly the same as yours - we will have to learn about each other's thoughts. Maybe it will be easier than we think, maybe not. Certainly speech is an old fashioned, out dated means of communication - it's on its way out! (2008)

Whether in terms of Warwick's bypass system or Clark's new prostheses, the body diminishes in importance. The mind, in contrast, gains more degrees of freedom. According to Clark this will accelerate:

> [N]ew thinking systems create new waves of designer environments, in which yet further kinds of extended thinking systems emerge. By this magic, seeded long ago by the emergence of language itself, the ratchets engage and the golden machinery of mind-design, mind redesign, and mind re-redesign, rumbles into life. The process continues, and it is picking up speed. Some of our best new tools adapt to individual brains during use, thus speeding up the process of mutual accommodation beyond measure. Human thought is biologically and technologically poised to explore cognitive spaces that would remain forever beyond the reach of non-cyborg animals (197).

Simon Young (2006) pronounces Homo cyberneticus to be the next stage in human evolution. He traces cyberneticus to the Greek, *kubernetes*, or steersman of a ship. He understands the mind to be the steersman and the body to be an unworthy vessel. He asserts, "The body may want to self-destruct—but does the mind? No. Yet our genes insist upon it, against our will." (371) Freed from "genetic slavery," minds will evolve, thereby setting the stage for these cognitivist triumphs: 1) the evolution of a cybermind emerging from the network of inter-dependent minds (318), 2) "the mind of evolution become conscious of itself" (39), and coming to know the "Mind of God."(367)

Neurobiologists assert that the mind is an epiphenomenon of the working brain. It is dependent on the functioning of cells, genes, hormones, proteins, and blood.

This presents a challenge to the conception of mind independence from body. Ray Kurzweil offers a "patternist" perspective as an alternative to this materialist account. Biological and nonbiological systems such as computation systems need not be treated as being fundamentally different because all systems are reducible to patterns. Evolution, biological and technological, entails the progressive development of patterns. Human intelligence is an evolutionary milestone that Kurzweil readily admits has a biological basis, nevertheless as its pattern is made known through neuroscience, informatics, etc., ways will be found to replicate it or reformat it to allow symbiosis or mergers with newly created forms of computation and artificial intelligence. The pattern that is intelligence will continue to evolve. Like Young, he foresees nothing, including the organic brain, getting in the way: "[I]ntelligence is the most powerful "force" in the universe. Intelligence, if sufficiently advanced, is, well, smart enough to anticipate and overcome any obstacles that stand in its path." (2005:206).

Religious Critique: Escape the Body, Lose the Soul

Instead of attacking transhumanism with a scientific-skeptical question, Can this be done?, opponents challenge with a moral question, Should this be done? Most non-experts willing to hear out both sides will most likely decide their positions based on the debate over the latter question. The preference for mind over body has its religious parallel in the elevation of spirituality over material existence. Platonism, Manichaeism, and Gnosticism, for example, hold that the material world is a corruption of an ideal state. Humanity, trapped and confused in the physical realm, nonetheless yearns for goodness and to rejoin the divine being. Redemption is possible by a renouncement of physical attachments and through special knowledge or aesthetic practices that promote spirituality.

Irenaeus, and other central figures behind the institutionalization of Christianity and the establishment of Church doctrine, strenuously opposed Gnosticism and campaigned for the exclusion of the Gnostic Gospels in the canon. He argued that a non-divisible God oversaw creation and intended human existence to be the way it is. Humans develop spiritually through living and suffering, not by trying to escape life. Similarly the incarnation of Jesus is thought to be a pivotal act in salvation.

Erik Davis (1998) coined the term "techgnosis" for what he characterizes as a contemporary, secular version of Gnosticism. Pure intelligence or information replaces spirituality as the ideal state, technology replaces the role of God or Christ as savior, but otherwise the message is the same–the body is an impediment to humanity's quest. C. Christopher Hook accuses transhumanism, specifically, for promoting Gnostic claims:

> *Transhumanism* is in some ways a new incarnation of gnosticism. It sees the body as simply the first prosthesis we all learn to manipulate. As Christians, we have long rejected the gnostic claims that the human body is evil. Embodiment is fundamental to our identity, designed by God, and sanctified by the Incarnation and bodily resurrection of our Lord.

> Unlike gnostics, transhumanists reject the notion of the soul and substitute for it the idea of an information pattern (2004).

Elaine Graham contrasts transhumanist anthropology with "theological anthropology":

> This predilection for the qualities of detachment, omniscience, immutability and incorporeality translates into a transhumanist anthropology founded on disdain for embodiment, vulnerability and finitude in which only the fittest will survive. A theological anthropology, on the other hand, would see things differently, however, not least in its eschewal of a symbolic of transcendence premised on omnipotence, immortality and rejection of the material world. This vision regards the immanent, material world not as an impediment to authentic spirituality, but the very realm of divine-human encounter (2003:40).

Henk Geertsema asserts that "We are called to respond to God, who created us, and to live according to the intentions given with creation." (2006:313) God fashioned man and woman from material to take a specific physical form. This is not a mistake or punishment, rather it is a gift. God is pleased with His creation and, despite pain and toil, existence in the human form entails a state of grace.

Christian critics contend that becoming a full-fledged cyborg is perilous. First, the modifications and enhancements will be done in defiance of His will. Second, the excursion into human–machine genesis will be done without the wisdom of God. Will the right balance be struck? It is possible that in the attempt to isolate and merge human intelligence with artificial intelligence, for example, vitality, spontaneity, and emotionality will be reduced. Third, and most importantly, radical transformation means radical alienation from God. It is akin to a second Fall, a repudiation of God's gift of creation and a prideful decision to go it alone. Mark Hanson describes this in terms of sin:

> Only a faith that recognizes a dependence upon God can save the self from the sin that is the human attempt to make the self God…Sin is occasioned by anxiety when a person fails to acknowledge his or her finiteness and the dependence of his position upon God and thereby seeks powers and securities that transcend the possibilities of human existence (1999).

Christians find in the New Testament hope for a different kind of transformation through the resurrection of Christ. The gospels describe Jesus rising from the dead, having physical form, and relating in ordinary ways with others, e.g., sharing meals with his disciples. A promise is made that those who believe in Christ and follow his way will also have eternal life. Robert Song (2006) states that for Christians, "transcendence takes the form not of escape from the vulnerability that accompanies embodiment, but of the hope of a transformed body in a divinely renewed heaven and earth." This transformation does not entail technological intervention, nor is it accomplished through the mind's liberation from the body. Rather, it is bestowed by the redemption of Christ and it involves a perfection of the original form.

What if the transhumanists are wrong to devalue the human body? What happens to us if we work in defiance of God's plan? What if by radically altering our existence we lose a state of grace or the chance to exist in the afterlife in

perfect form and in close relationship to God? These questions are meant to warn others, especially the faithful, that radical transformation is a dangerous path to take and that there may be supreme costs associated with it.

Secular Critique: Escape the Body, Lose the Self

Secular critics present a cautionary tale of radical transformation that is closer to home, literally. It has to do with kids (and adults) playing on the computer. In many countries, the average numbers of hours spent online has increased over the past ten years. As internet use increases there appears to be a reduction in television viewing time, a tradeoff that many would find acceptable. Some studies have found, however, that time displacement is more serious in that family and community involvement declines. (See, for example, Nie and Hillygust 2002)

Social scientists and medical professionals are most concerned with ill effects associated with heavy internet use. Heavy users often neglect studies, work, family, and friends. They often lose sleep and do not eat well or exercise. (Block 2008) Although time spent can accumulate from a variety of online activities, for example, chat, social networking (Myspace and Facebook), gambling and pornography, some researchers have identified online gaming as a particular problem. A recent study of fourth, fifth, and sixth grade Korean school children found that gaming, but not other online activities, was associated with a perceived decline in family time and family communication. (Lee and Chae 2007) (South Korea is a leader in broadband access and high school students in that nation average 23 hours per week on gaming. (Kim 2007)).

What makes gaming so captivating? According to Anna Meenan, massively multiplayer online role-playing games (MMORPG), such as World of Warcraft, are structured to require increasing playing time to achieve objectives: "At the highest levels, players must band together into guilds to go on quests or raids that can require ten or more hours of continuous play, with some players reporting playing over 70 h per week." (2007:1117) Besides the game commitments, some researchers cite the allure of virtuality. In her groundbreaking investigations into Internet play and identity, Sherry Turkle (1995) found that some of her interviewees simply preferred their virtual self over their real self and wanted to spend as much time as they could in their virtual world, and this was when such worlds and selves were manifested through text! Today, the graphic worlds are so much more sensory satisfying and avatars provide for a better presentation of self.

Barbara Becker (2000) cites one person admitting in her study that gaming is a way "to escape from the bodily prison." She believes that this is a common motivation. She notes that the material world and physical body entail stubborn realities and that "[i]n communicating with the world through technology or media, people try to avoid feeling the concrete resistance of its materiality." Switching to virtual reality provides a sense of relative gain in mastery: "as a result the power of the subject seems to increase. The subject solipsistically

establishes itself as the ruler of a world." Becker asserts that the transhumanist vision of radical transformation is similarly seductive, promising many more degrees of freedom to play and self-experiment. She dismisses this for being "a reconstruction of old fantasies which are returning in new technological clothes and making a great deal of noise."

One such "old fantasy," according to John Sullins (2000), comes from Descartes' philosophy. Rene Descartes treated the mind and body as being distinct. The body, but not the mind, is of the physical world, influenced by natural laws and operating in a similar fashion as machines. Through the body's sensory receptors, information is presented for the mind's perusal. In his famous thought experiment Descartes imagines a demon manipulating the senses. He also offers ordinary examples of sensory error. The lesson to be drawn is that the body is not to be trusted as a source for certainty regarding one's existence. Only the action of the mind, or the "I" that is thinking, is certain. The primacy of the mind is clear in his epistemology that favors rational thought and deduction.

Sullins applies Maurice Merleau-Ponty's phenomenology to point out, however, that in our lived experience we do not treat the mind as the independent subject and the body as its object. As we go about our daily lives we do not instruct every bodily activity, nor do we perceive our bodies as being distant from us. Furthermore, body image, physical habits and sensitivities, etc., are crucial to our experience of self. The body is not an object, rather it is intricately involved with the mind and constitutive of the subject. Only upon reflection or in the development of philosophical systems do we disassociate the body and mind. Sullins asserts that an acknowledgment of "body-subject" has implications for radical transformation:

> Our personal identity is based on the fact that we are embodied in a particular way and have experienced a certain, reasonably continuous, spatio-temporal history without which we have no identity, we are not a person. Thus the technologies we have been discussing will not be able to deliver on their more ambitious claims. We will not be able to upload our mind into a machine and still remain ourselves for long. Even if uploading our consciousness into a machine was somehow technologically feasible, all we would achieve is the slow annihilation of our personality as it melted into the functions of the machine over time. At best we would create a new machine personality with a new distinct individuality.

What if an organic body or machine substrate could be avoided altogether? What if our pattern could be liberated? N. Katherine Hayles (1999) notes that such speculation is encouraged by a strategy employed in cybernetics to treat mind as an information system irrespective of platform or housing. Neuron or computer chip, flesh or metal, it does not matter. She argues against the reductionism and asserts that "for information to exist, it must *always* be instantiated in a medium." (13) Like Sullins, she insists that whatever mind might be generated on another medium it will not be human: "Human mind without human body is not human mind." (246).

Transhumanists, in particular, have an interest in promoting the idea that cyborgs develop more capacities over time and in the future they will span more domains and will have more complex interconnections. Invariably the imagery

used to describe this being is a distributed network. What will happen to the human self? Will a central agent exist or will it be distributed or dissolved in the network? These are very difficult questions primarily because there is no consensus regarding the nature of the human self. Andy Clark favors Daniel Dennett's theory that the central self is an illusion.

> There is no self, if by self we mean some central cognitive essence that makes me who and what I am. In its place there is just the "soft self": a rough-and-tumble, control sharing coalition of processes– some neural, some bodily, some technological– and an ongoing drive to tell a story, to paint a picture in which "I" am the central player (138).

If this is the case, there is no reason to be overly concerned about the loss of a sense of self in transhuman existence. Configurations that provide identity will emerge from a more extensive network of advanced processes just as surely as they have emerged from a more limited "ensemble of tools." Kurzweil believes that we are sufficiently pliable to retain continuity of identity as we change. Hayles, however, does not preclude negative outcomes. She takes seriously a concern raised by Norbert Wiener, a principle architect of cybernetics, that the subject may be subsumed. Estrangement is very possible. Exploitation and manipulation need to be considered as well: "The ultimate horror for the individual is to remain trapped "inside" a world constructed by another being for the other's own profit." (162).

Transhumanists urge men and women to take charge of their own destiny, to reject biological limitations, and to take on new capacities. They give every impression that intrepid innovators will remain in control of this process. However, Hayles, Sullins, and others question whether the willful agent will be left intact as the body is left behind. Will the self survive radical transformation?

Moderate Transformation

Gregory Stock, a biophysicist, believes that the public will not buy radical transformation. This can be understood literally: Consumer demand drives the commercialization of technology and consumers will opt for safe, reliable, and reversible procedures over those that are exotic, risky, and permanent. Why put your mind, body, and self in jeopardy if relatively benign technologies can provide good health and longevity? Why become a cyborg when being a "fyborg" offers the same benefits without the costs? Alexander Chislenko (1995) defined a functional cyborg or fyborg as a biological organism supplemented with technological extensions. Many of us utilize extensions such as eyeglasses, contact lenses, hearing aids, blue tooth head sets, IPods, and cell phones, so according to the definition we are fyborgs. With further miniaturization of electronic/computer devices more and more gadgets will become wearable.

Moderate Transformation as Value Gained

According to Stock, "people want to be healthier, smarter, stronger, faster, more attractive" (2002:179) but most people are technology pragmatists rather than technophiles. They also tend toward conservatism when it comes to the human body. A chapter entitled, "Our commitment to our flesh," best expresses his contention that if given a choice between hardware implanted in tissue and equally effective wearable devices, most people will choose the latter. A powerful storage and retrievable system that can be worn poses fewer health risks, and is easier to repair, upgrade, and replace than memory chips embedded in the brain (25–26). Moreover, a wearable device does not threaten the sense of body integrity. He sees no value in Kevin Warwick's cyborg project when there are more practical alternatives.

Fyborgization cannot satisfy all desires, especially for better health and longevity, so Stock recommends biomedical augmentation as well. He favors gene therapy and germline selection and modification, in particular. The accepted wisdom today is that the expression of genes is important to health and longevity. The goal of gene therapy, in simple terms, is to replace dysfunctional genes with functional ones. As it is practiced now, somatic cells are targeted, e.g., liver and lung cells. Changes in these cells cannot be passed along to progeny. Germline gene therapy, on the other hand, involves germ cells (e.g., egg, sperm) or cells of the blastomere. Ever the pragmatist, Stock prefers germline intervention because of certain advantages. Most important is the timing of the intervention. Germline engineering is done at the very start of biological life. At this stage, germ cells or embryonic stem cells are amenable to laboratory techniques. Also, modifications made at this stage may be carried on to every cell in the body. Intervening later (with somatic cell gene therapy) entails dealing with a much more complex organism and under a clinical setting. Moreover, bioengineers must create a safe and effective vector system, typically a genetically-modified virus, to target specialized cells.

The downside of germline engineering's thoroughness is that deleterious modifications would be systemic and possibly passed down to progeny through sexual reproduction. Critics point out that we are far from understanding the complex actions and interactions associated with genes and that experimentation along these lines would be imprudent and unethical. Stock suggests a technological fix: synthetic chromosomes with reversible genes. Gene modules on an extra chromosome (loaded at the point of germline intervention) could be switched on by taking a tailor-made drug and, if ill effects were detected, switched off. This is how Stock sees it playing out across generations:

> Imagine that a future father gives his baby daughter chromosome 47, version 2.0, a top-of-the-line model with a dozen therapeutic gene modules. By the time she grows up and has a child of her own, she finds 2.0 downright primitive…The daughter may be too sensible to opt for some of the more experimental modules for her son, but she cannot imagine giving him her antique chromosome…As far as reverting to the pre-therapy, natural state of 23 chromosome pairs, well, only Luddites would do that to their kids (76).

From Stock's point of view, the beauty of this approach is that the novel gene modules could boost immunity, thwart cancer, and slow down aging without necessitating a radical departure from the human form. Moreover, this prevents disease whereas other methods including somatic cell gene therapy and therapeutic stem cell techniques are geared toward treating disease. He acknowledges that augmentation of the genome and "entry of laboratory machinery into human reproduction" (111) will take some getting used to, nonetheless, given mainstream acceptance of other assisted reproductive technologies and the clear advantages of germline engineering, he is optimistic of its success.

Moderate Transformation as Value Lost

Stock's transhuman may be recognizable to us, nevertheless, critics object to its bioengineering especially when it takes place at the start of life. For religious conservatives any departure from what they believe to be the God-given constitution of human nature goes against His will. Those who oppose assisted reproductive technologies and abortion also oppose germ line engineering. Conception and gestation are deemed to be inviolable, a sacrosanct beginning that is meant to proceed naturally.

Arguments aimed against radical transformation are used as well to contest moderate transformation. Scientists may try to "play God" but they do not possess His wisdom. There is too much preoccupation with temporal matters and not enough attention paid to spiritual development. What good is the augmentation of the body if it comes at the expense of the soul?

Stock and others present moderate transformation as the means to bountiful longevity, but so-called "life cycle traditionalists," such as Leon Kass, assert that there will be costs. He believes that the normal human lifespan promotes a more focused approach to life projects. He warns of ennui at the personal level and generational conflict over finite resources at the societal level.

Francis Fukuyama sees sexual reproduction as a genetic lottery that acts as a social equalizer. With controlled reproduction in a market economy, biological advantages will be purchased. Paul Lauritzen wonders how a bio-privileged class will relate to the unenhanced or poorly enhanced. Given that chronic illness and senescence takes a toll on physical appearance and productivity, will they feel pity or disgust for those who can't afford augmentation or elect to forego it? He worries that the significant differences in life experience and longevity "may erode a sense of common humanity" and "run the risk of blocking compassion and advancing intolerance." (2005: 30).

Secular critics reject Stock's libertarian argument that germinal choice technologies will allow for greater freedom of choice. Instead, they see parents gaining ever more control over their "designer babies," social competition pushing people to alter their bodies, and biomedical corporations manipulating consumers through advertising and marketing campaigns.

I have presented only a sampling of the objections to moderate transformation, nevertheless this selection should be sufficient to underscore the basic point made by critics that the application of transtechnologies can never be moderate in its effects. Personality systems, micro and macro social systems, according to these critics, have evolved according to certain natural parameters and change outside these parameters will necessarily cause disturbances. Many harbor a deep suspicion of what is sometimes referred to as "corporate science" and do not want to see further market penetration into human life. Rather than focusing on what might be gained through transtechnologies, they highlight personal and collective goods that might be lost.

Leon Kass states it this way: "We need to realize that there is more at stake in the biological revolution than just saving life or avoiding death and suffering. We must also strive to protect and preserve human dignity and the ideas and practices that keep us human." (2002:1) This emphasis on human dignity or human flourishing is apparent in Michael Sandel's call for an "ethic of giftedness" (2007:45) Sandel celebrates the openness of human life, unenhanced. As long as an athlete is not artificially enhanced or a child is not designed, we can appreciate the unique qualities and achievements that he or she brings to the world. Conversely, striving for perfection by means of bio-engineering entails an "excess of mastery and dominion that misses the sense of life as gift." (62) Humility, empathy, patience, and wisdom are fostered through acceptance of limitations.

Bill McKibben (2003) also believes that enhancements, paradoxically, will stymie human flourishing. He warns that the designed person will be crippled by existential uncertainty, never quite sure if the "programming" is responsible for his or her motivations, always wondering "why I choose what I choose." (49) Achieving "flow"–a remarkable experience of being completely immersed in a challenging activity—is unlikely given such self-doubts.

Leon Kass agrees that nobility or elevation of character will not be fostered by transgenic technologies. Life may be extended, suffering reduced, but with the grit of human life removed—the hardship, the mortality—there will be little opportunity and inclination to face and overcome adversity and thereby achieve true dignity. He declares that "the downward pull of bodily necessity and fate makes possible the dignified journey of a truly human life." (2002:18) The natural parameters of the human species, including the genome, sexual reproduction, the life cycle, generations, and kinship, not only provide the best context for flourishing, they serve as a common heritage and mooring. McKibben (2003) predicts that the first enhanced child will "see a gap between himself and human history" (64) and "[h]e'll be marooned forever on his own small island, as will all who follow him." (65).

Defending Posthuman Dignity

Transhumanists reject any argument derived from a theological claim of telos, i.e., that human beings were fashioned in a particular form to realize a divine purpose. Such a claim presupposes that 1) a benevolent supernatural being exists, 2) that

this being has specific expectations for humanity, and 3) that these have been made clear to humanity. Ordinarily a believer makes a leap of faith that such a revelation has been made as truly related by a holy figure or recorded in a sacred text. The transhumanists practice secular-scientific skepticism and dismiss creation stories, such as the one told in Genesis, as lacking scientific validity. Furthermore, they insist that any proposal regarding science and technology policies based on creationism or Intelligent Design should not be taken seriously in the public arena.

The transhumanists contend that the "bioconservatives" have it all wrong about human nature because they overemphasize stasis. Andy Clark explains that not only has the species changed over time through biological evolution, it is unusually dynamic in other ways:

> It is our natural proclivity for tool-based extension, and profound and repeated self-transformation, that explains how we humans can be so very special while at the same time being not so very different, biologically speaking, from the other animals with whom we share both the planet and most of our genes. What makes us distinctively human is our capacity to continually restructure and rebuild our own mental circuitry, courtesy of an empowering web of culture, education, technology, and artifacts (2003:10).

In his article, "*In Defense of Posthuman Dignity*," Nick Bostrom (2005) questions whether human dignity is fostered through conservation by challenging an underlying premise that human nature is set or pinned down by the human genome. He insists, instead, that ours is a species that extends and transcends biology through social and technological constructions, and as these change, we change, generation after generation. There is no stable state to preserve:

> What we are is not a function solely of our DNA but also of our technological and social context. Human nature in this broader sense is dynamic, partially human-made, and improvable. Our current extended phenotypes (and the lives that we lead) are markedly different from those of our hunter-gatherer ancestors…
> Yet these radical extensions of human capabilities– some of them biological, others external – have not divested us of moral status or dehumanized us in the sense of making us generally unworthy and base. Similarly, should we or our descendants one day succeed in becoming what relative to current standards we may refer to as posthuman, this need not entail a loss dignity either (213).

Simon Young (2006) identifies in human beings the "will to evolve" toward "ever-increasing survivability and well-being." (19) Fortunately, according to Young, humans are uniquely gifted to exercise this will. We have bypassed Darwinian evolution with the first steps in "designer evolution" and continued progression is our species' destiny and the individual's best chance for flourishing. Attempts to conserve human nature by banning enhancement will violate the quintessential drive of human beings! Ray Kurzweil suggests a cosmic destiny: "As I see it the purpose of the universe reflects the same purpose of our lives: to move forward to greater intelligence and knowledge. Our human intelligence and technology form the cutting edge of this expanding intelligence…" (2005:420).

Taboo or Tolerance

Conservationists and transhumanists argue over what we should become on the basis of their respective understanding of what we are. What is the essence of human nature? If we come to the debate already convinced of the answer it will dictate our response to transhumanity. For instance, if one believes that there is a divine purpose behind the creation and preservation of human biology, a transhuman turn would be understood as contrary to God's will. Such hubris to transform human beings! If one believes that humans are creatures of evolution with the capacity and drive to evolve in new ways, a transhuman turn would be understood as a new step along the same path. Carry on!

However, not everyone is so certain about the essence of human beings. What if we are suspicious of the very notion that there is one true nature or we are simply uncomfortable with the debate at such an abstract level. For the practical-minded, their stand vis-à-vis transformation may come down to a cost-benefit analysis. As I'll describe in the next chapter, the transhumanity debate offers a well-developed discussion of risks. However, is there a more intuitive way of knowing what to do?

A while ago I was talking to a neighbor about my studies on transhumanity and when we reached the subject of genetic engineering she shook her head and said, "That really bothers me if they mess with genes… That's very creepy." I suspect that this is a common sentiment. Leon Kass argues that we should attend to the "Yuck Factor" because the feeling of repugnance registers the violation of a taboo and serves as a warning of overstepping our bounds. He states that "repugnance is the emotional expression of deep wisdom, beyond reason's power completely to articulate it" and that "revulsion may be the only voice left that speaks up to defend the central core of our humanity." (2002: 147–150) He contends that most people are deeply troubled by the prospects of human bioengineering and that laws and regulations should reflect that.

Transhumanists strongly disagree, and counter with a rights-based argument. They note that especially in heterogeneous societies, citizens are unlikely to share the same perspectives and beliefs. What one person perceives as strange and dangerous another might see as potentially uplifting. Nick Bostrom (the Founding Chair of the WTA) insists that transhumanists do not wish to impose new technologies on anyone, rather they are simply requesting ample latitude for individuals to choose scientific and medical advances:

> "[t]ranshumanists promote the view that human enhancement technologies should be made widely available, and that individuals should have broad discretion over which of these technologies to apply to themselves (morphological freedom), and that parents should normally get to decide which reproductive technologies to use when having children (reproductive freedom)" (2005:203).

Citizens may find other citizens' religious beliefs and practices erroneous, strange and, perhaps, offensive, but tolerance is expected for the sake of the entire system or, if for no other reason than to ensure quid pro quo. If social conservatives wish to make basic life decisions without interference, so too should they allow

others this autonomy. Gut reactions are insufficient grounds to deny another person the right of self-determination.

Of course, transhumanists understand that if enhancement technologies are perceived by most to be out of bounds, prohibition is more likely. Instead, they portray these technologies as being comparable to protected procedures such as cosmetic surgery, laser eye surgery, sex reassignment therapy, psychotropic medication, hormone treatments, and physical fitness training—all means by which some individuals pursue the right to modify their bodies and minds. Individuals exercise reproductive or procreative rights through mate selection, sperm and egg selection, and embryo screening, and Gregory Stock (2002) describes germline engineering along the same lines. Transhumanists want transgenic applications to be treated no different than extant treatments: face safety and efficacy assessments, but not a "yuck trial" or religious litmus test.