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Two Concepts of Immortality: Reframing Public Debate on Stem-Cell Research

Frank Pasquale*

The soul, doubtless, is immortal—where a soul can be discerned.
—Robert Browning, *A Toccata of Galuppi's*¹

Abortion, euthanasia, and the death penalty have sparked emotional public debates for the past three decades. Just as these controversies over life-*termination* have forced us to think systematically about ethics in the public domain, new technologies of life-*extension* will provoke controversy in the twenty-first century. Known generally as regenerative medicine, the new health care seeks not only to cure disease but to arrest the aging process itself.

So far, public attention to regenerative medicine has focused on two of its methods: embryonic stem-cell research and therapeutic cloning. Since both processes manipulate embryos, they alarm many religious groups, particularly those that believe life begins at conception. Such religious objections have dominated headlines on the topic, and were central to President Bush's decision to restrict stem-cell research.

Although they are now politically potent, the present religious objections to regenerative medicine will soon become irrelevant. Scientists are fast developing new ways of culturing the biological materials now exclusively produced by embryos. Given their expressed commitment to the “sanctity of life,” religious leaders will soon find the tables turned: researchers will accuse *them* of causing death

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1. ROBERT BROWNING, *A Toccata of Galuppi's*, in ROBERT BROWNING: A CRITICAL EDITION OF THE MAJOR WORKS 184 (Adam Roberts ed., 1997) (1855).

if they fail to support medicine that cures the sick without harming embryos.

Perhaps anticipating this development, those uneasy with regenerative medicine have tried to shift the debate to focus on its long-term effects. They believe that innovations that now look benign might lead to an era of untrammelled biotechnological manipulation of our lives. For example, the same technology used to eliminate disease-causing genes or to clone embryos may eventually be deployed to produce genetically engineered children. That could, in turn, entrench class differences, since only the wealthy could afford the most desirable genetic enhancements.²

Such objections may be speculative. Nevertheless, they deserve more attention, not necessarily as predictions of the future, but as indictments of the present. We are all disturbed by hypothetical dystopias like *Brave New World*.³ But their most important flaws—the inequality, degradation, and moral irresponsibility of their inhabitants—are already apparent in the distribution of regenerative therapies. The world's wealthiest nations spend hundreds of millions of dollars on elaborate technologies of life-extension, while contributing only trivially to efforts to assure basic medical care to the poorest. Public debate on regenerative medicine must acknowledge this inequality. Societies and individuals can invest in it in good conscience only if they are seriously committed to extending extant medicine to all.

Unfortunately, regenerative therapies threaten to undermine the very moral commitments that allow us to recognize the inappropriateness of their present pursuit. Human beings have always sought to live up to some normative standards. When medical science could only delay death, these standards always took certain forms, forms that I call “positive immortality.” As promised by both secular and religious humanists, positive immortality consists in the identification of the self with the timeless. It encourages the pursuit of goals and the adoption of roles governed by the standards of a shared human community. Regenerative medicine now promises a new normativity for humans, the prospect of indefinite self-preservation. Whereas old aspirations to immortality depended on some positive creation or

2. See Maxwell J. Mehlman, *The Law of Above Averages: Leveling the New Genetic Enhancement Playing Field*, 85 IOWA L. REV. 517 (2000).

3. Huxley's novel speculated about the nature of human society in the twenty-seventh century. Huxley imagined the inhabitants of this “brave new world” would be engineered, via embryonic manipulation, to enjoy continuous but empty and quiescent contentment. The society was rigidly stratified into classes “designed” for different types of work. See ALDOUS HUXLEY, *BRAVE NEW WORLD* (1932). Huxley explicitly connected his famous dystopia to present technologies in later works. See ALDOUS HUXLEY, *BRAVE NEW WORLD REVISITED* (1958).

action, “negative immortality” hinges simply on survival, the evasion of death.⁴

Regenerative therapies entail not just an extension of life, but a shift in our basic attitudes towards death. Instead of trying to cast the stem-cell controversy in terms of “science versus religion” or “pro-life versus pro-choice,” journalists and scholars should consider positive and negative concepts of immortality as truer normative poles for the debate on regenerative medicine. This article enables such a shift in perspective by examining the causes, consequences, and philosophical bases of negative immortality.

Journalists and scholars have so far designated the “sides” in this debate as pro-life and pro-choice, or religion and science. By examining testimony at committee hearings on stem-cell research, Part I demonstrates that this dichotomy distorts the controversy. The religious opponents of stem-cell research have rarely questioned its ultimate aims. Far from being dispassionate scientists, many of the researchers advocate a salvific role for medicine in human life.

Many of the stem-cell researchers profess only to want to cure disease. However, it is difficult in principle to distinguish targeted regenerative therapies from the endless replacement of body parts eagerly anticipated on the fringes of the field. Once such prosthetics become widespread, the “downloading” of memory, intellect, and will onto a medium more durable than the brain is a logical next step—and is now being explored by artificial intelligence researchers. Unmoored from past biological limits, the new science seems to consider the body little more than an inconvenient container for the mind. I explore this problem in Part II.

In Part III, I argue that the consequences of this conception of the body cannot be fully understood unless we situate negative immortality in a field of contemporary ontological and ideological commitments. Secular and religious humanisms encourage individuals to identify with some roles or standards beyond the self, generating positive ideals of immortality. These ideals are endangered by the

4. I hope to be fairer here to negative immortality than Isaiah Berlin was to “positive liberty” in his essay *Two Concepts of Liberty*. In that essay, Berlin affirmed the value of “negative liberty”—the bare capacity to do as one wills—in comparison with “positive liberty,” the freedom associated with the exercise of virtues or activities deemed valuable within some ideological framework. See ISAIAH BERLIN, *TWO CONCEPTS OF LIBERTY* (1961). Berlin intimated that positive liberty was inevitably intertwined with totalitarianism, a highly contestable claim to be sure. To some extent, my concept of negative immortality is analogous with the concept of negative liberty: both describe states in which an individual is capable of doing what he wills. Positive immortality, like positive liberty, is premised on leading a good life according to some conception of human flourishing. Thus my own critique of negative immortality echoes some leading criticisms of Berlin’s dichotomy. See, e.g., CHARLES TAYLOR, *What’s Wrong with Negative Liberty*, in *2 PHILOSOPHICAL PAPERS: PHILOSOPHY AND THE HUMAN SCIENCES* 224 (1985).

pursuit of negative immortality, since the horizons of value that give meaning to the pursuit of positive immortality would not be shared by those pursuing indefinite self-preservation. Its pursuit would supplant socially recognized survival with scientifically verified survival. To the extent that people come to accept the very idea of the latter, the former withers.

Once properly contextualized, the pursuit of indefinite self-preservation appears either futile or self-defeating. Part IV examines whether any version of negative immortality would actually preserve the person who chooses it. It concludes that negative immortality is less about *preserving* oneself than it is about identifying oneself with some aspect of one's identity—be it one's genes, body, or thoughts—that can be preserved. Even if preserving all these aspects of the self were possible, it may not be desirable. By analogizing from more proximate technological advances, we can better understand the shortcomings of the new biotechnology.

Admittedly, these critiques do not touch directly on the incremental advances of regenerative medicine. Nevertheless, they indicate how its pursuit threatens to distract us from the most important questions confronting our society. Given the vast inequality of life chances prevailing in the world, the elite pursuit of technologies of life-extension threatens to desensitize its devotees to the fate of those unable to command even basic medical care. After examining the distributional consequences of regenerative therapies, Part V argues that even the most incremental advances should be pursued cautiously, if at all.

Part VI concludes with reflections on the personal and political choices raised by the new technologies of negative immortality. As medical science advances, questions concerning the proper allocation of public and private resources to health care will become increasingly urgent. We cannot consign these queries to technocratic cost-benefit analyses. The answers must ultimately depend on our considered attitudes toward death and immortality.

I. THE DISTORTED DEBATE OVER STEM-CELL RESEARCH AND CLONING

Many consider immortality the exclusive preserve of theological speculation. Recently, however, scientists have begun to employ the term. By researching ways of synthetically replacing human tissues, medical researchers have begun to raise the stakes of their interventions, from fighting disease to vanquishing death itself.⁵ According to

5. See DANIEL CALLAHAN, *THE TROUBLED DREAM OF LIFE* 58 (1993). Callahan, the

William Haseltine, leader of a major biotechnology company, “It’s a reasonable conjecture that we age because our stem cells age, and that if we were able to replace them with new and younger cells, we could continue healthy life in perpetuity.”⁶ If stem cells can be stimulated to grow into replacement tissues and organs, “[d]eath itself can be considered a disease.”⁷ Emboldened by the new technology, a small cult in France and Canada aims to use similar scientific techniques to clone individuals, in an effort to assure them deathless genes.⁸

These developments have provoked Congress, the President, and the public to scrutinize biotechnology. Over ten bills have been introduced in the 107th Congress relating to stem-cell research and cloning.⁹ House and Senate Committee hearings have featured testimony from doctors and lawyers, scientists and philosophers.¹⁰ Every shade of religious opinion, ranging from Catholic to cloning-cult dogma, has been aired. But the testimony has focused on a very narrow question: namely, the legitimacy of certain experiments involving embryos.

Both sides have gained by narrowing the debate in this way. By focusing on the embryos to be harmed, “pro-life” forces deflected attention from a morbid consequence of their advocacy: namely, an

founder of the Hastings Center, observes that modern medicine has come, “in its working research, and often [in its] clinical agenda, to look upon death as a correctable biological deficiency.” *Id.*

6. Nicholas Wade, *Apostle of Regenerative Medicine Foresees Longer Health and Life*, N.Y. TIMES, Dec. 18, 2001, at D1 (quoting Haseltine, Chairman of Human Genome Sciences, who argues that “there is no reason we can’t go on forever”).

7. Ronald Bailey, *Petri Dish Politics*, REASON, Dec. 1, 1999, at 33 (quoting biochemist Cynthia Kenyon).

8. Margaret Talbot, *A Desire to Duplicate: Is This How Human Cloning will Begin?*, N.Y. TIMES, Feb. 4, 2001 (Magazine), at 40 (describing the Raelians, a group whose tenets include the promotion of cloning as a form of resurrection). The group has posted its aims and tenets on the Internet. See www.rael.org. Although technology only now seems capable of achieving cloning, it has long raised similar enthusiasms. See MARTIN EBON, *THE CLONING OF MAN 4* (1978) (discussing debates over cloning occasioned by early advances in human genetics research).

9. For an introduction to the science of stem cells, see NATIONAL INSTITUTES OF HEALTH, *STEM CELLS: A PRIMER* (2001), at <http://www.nih.gov/news/stemcell/primer.htm>. Some of the proposed bills include The Stem Cell Research Act of 2001, H.R. 2059.IH, 107th Cong. (2001); The Responsible Stem Cell Research Act of 2001, S. 1349.IS, 107th Cong. (2001); The New Century Health Advantage Act, H.R. 2838.IH, 107th Cong. (2001); The Cell Development Research Act of 2001, H.R. 2863.IH, 107th Cong. (2001); and The Human Cloning Prohibition Act of 2001, H.R. 1644.IH, 107th Cong. (2001).

10. See *Human Cloning Prohibition Act of 2001: Hearings on H.R. 1644 Before the Subcomm. on Health of the House Energy and Commerce Comm.*, 107th Cong. (2000), available at <http://energycommerce.house.gov/107/hearings/06202001Hearing291/hearing.htm> [hereinafter “House Hearing on Cloning Prohibition”]; *Human Cloning Prohibition Act of 2001: Hearings on S. 709 Before the Subcomm. on Science, Technology, and Space of the Senate Commerce Comm.*, 107th Cong. (2001), available at <http://www.senate.gov/~commerce/issues/scitech.htm> [hereinafter “Senate Hearing on Cloning Prohibition”].

almost certain delay in the development of treatment for many fatal illnesses. On the other side, scientists have engaged in a debate that supposedly turned on facts, not values: the precise definition of zygote, pre-embryo, and embryo, rather than the consequences, goals, and availability of their research. As long as they have engaged in a familiar battle over the definition of life, neither side has had to defend its ultimate commitments.

Fortunately, secular critics of regenerative therapies have raised concerns about not only its methods, but its goals. They have focused on the type of society likely to be created if regenerative therapies become commonplace. Suspecting what the technologies may drag in their wake, several have invoked *Brave New World* and other dystopian futures. Although such concerns are conjectural, they provide an effective means of addressing the spectrum of issues raised by regenerative medicine, rather than simply focusing on narrow opposition to one of its present techniques.

A. Background of the Debate

Disputes over abortion, palliative care, and assisted suicide have made the definition of life a hotly contested political issue. Should a fetus acquire the rights of a person when it looks like one, or when it can sense like one? Does a patient condemned to a lifetime of excruciating pain or persistent vegetative status have a life worth living?¹¹ Does a brain-dead person even live?¹²

Our conceptions of what life is—as coded into law, hospital policy, ethics, and common parlance—determine our answers to these questions. These answers in turn shape our conceptions of life.¹³ Like

11. Cases concerning a “right to die” have reached the U.S. Supreme Court. See *Cruzan v. Director, Mo. Dep’t of Health*, 497 U.S. 267 (1990); and *Vacco v. Quill*, 521 U.S. 793 (1997). Judges around the world have grappled with the question of whether there is a “right to die.” See 2 GLOBAL CONSTITUTIONALISM 19 (Paul Gewirtz & Jacob Katz Cogan eds., 1998) (collecting cases such as *Rodriguez v. British Columbia*, *Washington v. Glucksberg*, *Airedale N.H.S. Trust v. Bland*, and *Shefer v. Israel*).

12. According to a U.S. Government commission, “An individual who has sustained either 1) irreversible cessation of circulatory and respiratory functions, or 2) irreversible cessation of all function of the entire brain, including the brain stem, is dead.” PRESIDENT’S COMMISSION FOR THE STUDY OF ETHICAL PROBLEMS IN MEDICINE AND BIOMEDICAL AND BEHAVIORAL RESEARCH, DEFINING DEATH: MEDICAL, LEGAL, AND ETHICAL ISSUES IN THE DETERMINATION OF DEATH 73 (1981). *But see* KAREN GRANDSTRAND GERVAIS, REDEFINING DEATH 3 (1986) (noting that “[t]here has been some debate over whether death is a process or an event. If it is a process, how are we to settle on a precise time of its occurrence? How are we to force it into the language of events? If it is an event, how do we explain the obvious biological situation that deterioration, destruction, and decay are not isolated events but gradual processes?”). See also DAVID W. MEYERS, MEDICO-LEGAL IMPLICATIONS OF DEATH AND DYING §§ 2:1-2:9 (1981 & Supp. 1992) (discussing stages in “process of dying”).

13. See, e.g., ROBERT BURT, DEATH IS THAT MAN TAKING NAMES: INTERSECTIONS OF AMERICAN LAW, MEDICINE, AND CULTURE (forthcoming 2002); Editorial, *Oregon Cuts Funds for Pain Care—Pays for Assisted Suicide*, 14 ISSUES IN L. & MED. 339 (1998).

principles of the common law that emerge from holdings in individual cases,¹⁴ a rough societal consensus is beginning to crystallize moral judgments about whether particular medical interventions are legitimate.¹⁵

But just as this provisional settlement emerges, research on new technologies of life-extension threatens to shatter it.¹⁶ Medical research utilizing human tissues has been controversial since the 1980s.¹⁷ Experimentation with human sperm and egg cells, embryos, and fetuses has attracted criticism from pro-life groups.¹⁸ In 1995, spurred by the Family Research Council, the National Conference of Catholic Bishops, and other pro-life groups, the Republican-controlled Congress began passing a series of riders to appropriations bills for the Department of Health and Human Services restricting the use of embryos in research. The 1998 riders provided that “that federal funds may not be used for”:

- (1) the creation of a human embryo or embryos for research purposes; or
- (2) research in which a human embryo or embryos are destroyed, discarded or knowingly subjected to risk of injury or death greater than that allowed for research on fetuses in utero under 45 C.F.R. 46.208(a)(2) and section 498(b) of the Public Health Service Act (42 U.S.C. 289g(b)).¹⁹

The legislation defined the term “embryo” as “any organism . . . that is derived by fertilization, parthenogenesis, cloning, or any other means from one or more human gametes or human diploid cells.”²⁰ As science in the area advanced, it generated uncertainty regarding exactly what Congress had proscribed.

Political support for the riders weakened as scientists concluded that embryo research would be increasingly important to new medical breakthroughs. By 1998, scientists developed new methods of

14. See MELVIN A. EISENBERG, *THE NATURE OF THE COMMON LAW* (1988).

15. See, e.g., Robin Toner, *The Abortion Debate: Stuck in Time*, N.Y. TIMES, Jan. 21, 2001, sec. 4, at 1 (listing areas of popular consensus on abortion policy and fetal cell research).

16. See, e.g., *Proceedings of the Templeton Foundation Conference on Extended and Eternal Life*, at <http://www.extended-eternallife.org>.

17. See Kenneth J. Ryan, *Tissue Transplantation From Aborted Fetuses, Organ Transplantation From Anencephalic Infants and Keeping Brain-Dead Pregnant Women Alive Until Fetal Viability*, 65 S. CAL. L. REV. 683 (1991); Christine L. Feiler, Note, *Human Embryo Experimentation: Regulation and Relative Rights*, 66 FORDHAM L. REV. 2435, 2439-40 (1998).

18. See, e.g., Press Release, Family Research Council, *Victimization as Research: Human Embryonic Stem Cell Experimentation* (Oct. 14, 1999), at <http://www.frc.org/get/is99g3.cfm>.

19. Pub. L. No. 105-277, § 511 (1999).

20. *Id.*

culturing human embryonic stem cells, which they believed could be instrumental in developing therapies for diseases ranging from Alzheimer's disease to diabetes.²¹ Eager to sponsor the research, the director of the National Institutes of Health (Harold Varmus) sought legal advice from the general counsel of the Department of Health and Human Services (Harriet Rabb) in order to determine whether NIH could sponsor embryonic stem-cell research.²² Since private researchers had recently cultured "lines" of stem cells from embryos they had consigned to destruction, Varmus believed that federal researchers could use these lines without being personally responsible for harming any embryo. Rabb agreed. She stated that human pluripotent stem cells, even if derived from an embryo, did not count as "embryos" within the statutory definition because they were not organisms. She therefore believed that the proposed research would not violate the law.

This interpretation provoked protests from the Congressional sponsors of the riders, who believed that the interpretation violated both the letter and spirit of the relevant law. Nevertheless, the Clinton Administration backed Rabb and Varmus and endorsed the research. Buoyed by the National Bioethics Advisory Commission's recent endorsement of stem-cell research, Secretary of Health and Human Services Donna Shalala assured Congressional sponsors that no federally sponsored research would directly result in the destruction of an embryo. Still offended by the research, pro-life forces vowed to make it a campaign issue, and then-Governor Bush vowed to end it if elected President. Once elected, Bush had to decide whether to keep this pledge. He ultimately decided to back very limited research, based on about sixty "lines" of stem cells then cultured by private researchers at the time of his announcement.²³ Bush reasoned that the "life-and-death decision" to utilize these embryos for research had already been made, and that the cells' regenerative capacities would render these lines sufficient to satisfy current research needs.

21. See NATIONAL BIOETHICS ADVISORY COMMISSION, ETHICAL ISSUES IN HUMAN STEM CELL RESEARCH 29 (1999).

22. Varmus specifically asked, via letter, "whether federal funds may be used for research conducted with human pluripotent stem cells derived from embryos created by in vitro fertilization or from primordial germ cells isolated from the tissue of non-living fetuses." See Sharon M. Parker, Comment, *Bringing Pope John Paul II's Encyclical The Gospel of Life to American Jurisprudence: A Religious, Ethical and Philosophical Critique of Federal Funding for Embryonic Stem Cell Research*, 17 J. CONTEMP. H. L. & POL'Y 771, 776 (2001) (quoting a memorandum dated Jan. 15, 1999 from Harriet Rabb, General Counsel of the Department of Health and Human Services, to Dr. Harold Varmus, Director of the National Institutes of Health).

23. See George W. Bush, *Remarks by the President on Stem Cell Research*, Aug. 9, 2001, at <http://www.whitehouse.gov/news/releases/2001/08/20010809-2.html>.

While Bush agonized over the decision, Congress considered a number of bills responding to the stem-cell debate and to a new innovation: human cloning. Unlike the stem-cell issue, a cloning ban was not very controversial; nearly everyone supported it. But sponsors quickly found that it was difficult to craft a bill that would both outlaw cloning and leave unaffected legitimate *private* research endeavors utilizing embryonic material. Several private researchers argued for an exception for research on “therapeutic” cloning—the splicing of nuclear material from an ill individual into a stem cell, so that that stem cell develops into a tissue that can replace diseased tissue from the ill individual. These researchers argued that the same techniques proposed for cloning an entire human being were integral to the development of tissue for regenerative therapies. Two rival bills emerged as responses to the situation. Conservative Republican Dave Weldon proposed criminalizing all cloning of embryos, and punishing offenders with jail terms of up to ten years and fines up to one million dollars. Another Republican representative would have barred only reproductive cloning designed to create embryos.²⁴ The Weldon bill was passed by the House.

B. Objections to Stem-Cell Research

Although the Senate failed to pass the Weldon Bill, Congress will eventually revisit legislation on stem-cell research and cloning.²⁵ When it does, the most vocal opponents of the research will likely be representatives of religious groups. The Catholic Church and many Protestant denominations have provided the most organized opposition to stem-cell research.²⁶ Given that the research now focuses on manipulation of cells from embryos, their spokesmen frame the issue as a natural outgrowth of their pro-life stance against abortion, euthanasia, and (for Catholics) the death penalty.²⁷ In his prepared

24. See Nancy Gibbs, *Cloning: Where Do You Draw The Line?*, TIME, Aug. 13, 2001, at 18. Gibbs summarized the arguments about the bill in this way: “Shut that research down, argue the scientists, and the most promising frontier in medicine is suddenly off limits. Let it proceed, say opponents, and you have crossed a line toward the manufacture of humans as tools, and there is no going back.” *Id.*

25. See Jennifer Powell, *ACT Chief Defends Company’s Embryo Cell Work*, BOSTON HERALD, Dec. 4, 2001, at O-35 (reporting that “efforts to immediately halt human cloning fizzled in the U.S. Senate yesterday”); Sheryl Gay Stolberg, *Controversy over Cloning Reignites in Congress*, N.Y. TIMES, Dec. 18, 2001, at A15.

26. Of course, not all religious groups oppose the research. Mormon Senators Orrin Hatch and Gordon Smith have strongly supported embryonic stem-cell research. See Drew Clark, *The Mormon Stem-Cell Choir*, SLATE, Aug. 3, 2001, available at <http://slate.msn.com/?id=112974>. Leon Kass has identified diverse Jewish positions on the issue. See Leon R. Kass, *L’Chaim and Its Limits: Why Not Immortality?*, FIRST THINGS, May 2001, at 17.

27. Pope John Paul II has vigorously developed and defended Catholic doctrine opposing contraception abortion, euthanasia, the death penalty, and the manipulation of embryonic tis-

testimony in favor of the Human Cloning Prohibition Act of 2001,²⁸ the United States Conference of Catholic Bishops' spokesman Richard Doerflinger argued that cloning would inevitably result in "exploiting and destroying fellow human beings."²⁹ Like spokesmen from the Family Research Council and the Methodist church, Doerflinger argued that cloning, even when not intended to produce new human organisms, offends the "sanctity and dignity of human life."³⁰ All agreed that manipulation of embryos would erode ethical safeguards essential to principled medical research.

Despite that concord, their warnings rang hollow in important ways. Whereas euthanasia and executions result in the end of a life, reproductive cloning actually creates life. Furthermore, therapeutic cloning promises to cure the sick by "regenerating" their aging bodily tissues. How could pro-lifers oppose that?

Most have responded by narrowly limiting their opposition to *embryonic* stem-cell research (ESCR), and insisting that all its touted aims could be accomplished with adult stem-cell research (ASCR). Since these cells are derived from a patient's own bone marrow, they raised none of the issues about embryos that had vexed Catholic and other religious leaders.³¹ Shortly before President Bush's announcement on the topic, Doerflinger publicized "a startling breakthrough . . . showing that adult stem cells from bone marrow can be directed to provide an abundant and accessible supply of nerve cells for transplant."³² Despite skepticism among scientists,

sue. See POPE JOHN PAUL II, *EVANGELIUM VITAE: ON THE VALUE AND INVOLABILITY OF HUMAN LIFE* (1995), available at http://www.vatican.va/holy_father/john_paul_ii/encyclicals/documents/hf_jp-ii_enc_25031995_evangelium-vitae_en.html; CATHOLIC CHURCH, *CONGREGATIO PRO DOCTRINA FIDEI, DONUM VITAE: INSTRUCTION ON RESPECT FOR HUMAN LIFE IN ITS ORIGIN AND THE DIGNITY OF PROCREATION* (1987).

28. House Hearing on Cloning Prohibition, *supra* note 10.

29. *Id.* at 78-87 (statement of Richard Doerflinger).

30. *Id.*

31. The Coalition of Americans for Research Ethics (CARE), a leading group of opponents of embryonic stem-cell research (ESCR), has no ethical objections to adult stem-cell research (ASCR). The Coalition is a signatory to a document signed by many critics of embryonic stem-cell research which calls for the development of adult stem-cell research. See CENTER FOR BIOETHICS AND HUMAN DIGNITY, *ON HUMAN EMBRYOS AND STEM CELL RESEARCH: AN APPEAL FOR LEGALLY AND ETHICALLY RESPONSIBLE SCIENCE AND PUBLIC POLICY*, at <http://www.stemcellresearch.org/statement/statement.htm> (reporting that "the British Medical Journal remarked on January 30, 1999, that the use of embryonic stem cells 'may soon be eclipsed by the more readily available and less controversial adult stem cells'"); see also DAVID A. PRENTICE, *POTENTIAL CLINICAL APPLICATIONS OF ADULT STEM CELLS*, at <http://www.stemcellresearch.org/info/potentialaps-nov18.pdf>. The website for the Coalition of Americans for Research Ethics can be found at <http://www.stemcellresearch.org>.

32. Richard Doerflinger, *Science and Morality: No Conflict*, in NATIONAL CONFERENCE OF CATHOLIC BISHOPS LIFE ISSUES FORUM, Aug. 18, 2000, at <http://www.nccbuscc.org/prolife/publicat/lifeissues/08182000.htm>. Numerous other religious commentators have celebrated ASCR as a gift from God.

religious leaders are eager to demonstrate that adult stem cells and other biological materials may provide the same research opportunities as embryonic stem cells.³³

Their enthusiasm is not merely a capitulation to political realities. Many opponents of stem-cell research are deeply sympathetic with its aims, welcoming new medical technologies as gifts from God. So far, concerns over embryos have trumped religious humanitarians' concern for the sick.³⁴ But new methods of regenerative medicine may convert the most vehement opponents of stem-cell research into ardent devotees. For example, Roman Catholic bioethicists often insist that "as long a treatment is beneficial in sustaining life and not burdensome, there is an obligation to use it."³⁵ As medical technology advances, the line between avoidable and unavoidable deaths is vanishing—creating countervailing pressures for critics of stem-cell research to acknowledge its potentially life-saving impact.

When "research advocates often argue that a failure to allocate money to the search for a cure of a lethal disease . . . will leave the blood of the continuing deaths on the hands of those who deny the money," questioning the goals of medical research may seem inhumane.³⁶ Nevertheless, the testimony offered by the few secular critics of therapeutic cloning invited to appear before Congress suggests that unqualified support for adult stem-cell research may be unwise. The secular critics shifted the focus of the debate from particular embryonic interventions to the social consequences of regenerative medicine. Judy Norsignian, a coauthor of *Our Bodies, Ourselves*, opposed therapeutic cloning because it "would make it all but impossible to enforce the ban on the creation of fully formed human clones."³⁷ She also warned that the research "would pave the way for unprecedented new forms of eugenics."³⁸ Francis Fukuyama's testimony on the Cloning Prohibition Act also raised the specter of widespread genetic engineering.³⁹

33. See Andrew Pollack, *Scientists Seek Ways to Rebuild the Body, Bypassing the Embryos*, N.Y. TIMES, Dec. 18, 2001, at F6.

34. See Jane E. Brody, *Weighing the Rights of the Embryo Against Those of the Sick*, N.Y. TIMES, Dec. 18, 2001, at F8.

35. CALLAHAN, *supra* note 5, at 70. Callahan is not relating his views here, but rather is focusing on Catholic teaching distinguishing between "ordinary means" that must be used to extend life and "extraordinary means" that may be utilized at the discretion of patients and doctors. *Id.*

36. *Id.* at 65.

37. See House Hearing on Cloning Prohibition, *supra* note 10, at 76-78 (statement of Judy Norsignian).

38. *Id.*

39. *Id.* at 87-91 (statement of Francis Fukuyama). Fukuyama testified that even therapeutic cloning should be banned because it could be "the opening wedge for a series of future technologies that will permit us to alter the human germline and ultimately to design people

The new chair of President Bush's Bioethics Advisory Council, Leon Kass, has also explored the social consequences and ultimate goals of advanced medical research. At the committee hearings, he cited Aldous Huxley's dystopia, *Brave New World*, as a cautionary tale deeply appropriate for an age eager to master the manipulation of embryonic and genetic material.⁴⁰ The warning echoed his earlier public statements about the moral dilemmas raised by biotechnology:

[C]ontemplating present and projected advances in genetic and reproductive technologies, in neuroscience and psychopharmacology, and in the development of artificial organs and computer-chip implants for human brains, we now clearly recognize new uses for biotechnical power that soar beyond the traditional medical goals of healing disease and relieving suffering. Human nature itself lies on the operating table, ready for alteration, for eugenic and psychic "enhancement," for wholesale re-design.⁴¹

Some may argue that it is unfair to base opposition to any particular technology on the results of adopting similar technologies.⁴² But Kass does a service to the debate by shifting attention from the methods to the goals of the new research. As medicine moves from reparative to regenerative and genetically engineered models of "health," circumspect consideration of the *cumulative impact* of the new technologies is essential.

A brief thought experiment confirms the importance of a broader perspective. Imagine that scientists were capable of chemically synthesizing sperms, eggs, and embryos. Would objections to research on these entities—which would destroy no humanly created embryos—simply cease? Presumably not. Such artificial manipulation of life seems just as repulsive, if not more so, than the artificial destruction of embryos. Yet publicized perspectives on stem-cell research have focused almost entirely on the latter, leaving critics ill-equipped to devise a principled response to the former. Those who are intuitively uncomfortable with the direction of regenerative therapies must now focus on the potential consequences of the research.

genetically." *Id.*

40. *Id.* at 50-55 (statement of Leon Kass).

41. Leon R. Kass, *Preventing a Brave New World: Why We Should Ban Human Cloning Now*, THE NEW REPUBLIC, May 21, 2001, at 22, available at http://www.thenewrepublic.com/052101/kass052101_print.html (arguing that "the so-called science-fiction cases—say, *Brave New World*—make vivid the meaning of what looks to us, mistakenly, to be benign").

42. See Chris Mooney, *Irrationalist-in-Chief*, AM. PROSPECT, Sept. 24, 2001, available at <http://www.prospect.org/print/V12/17/mooney-c.html> (arguing that Kass criticizes beneficial technologies because of unjustified speculation that they will eventually become harmful).

II. PATHS TO NEGATIVE IMMORTALITY

Focus on the long-term effects of the new medical research may appear unduly speculative at this time. Nevertheless, it is not premature. Whatever the ultimate fate of the anti-cloning bill and Bush's stem-cell compromise, the debate over the issues is likely to prove historically important. The new medical research has sparked a public controversy over technology reminiscent of bitter struggles over nuclear power and recombinant DNA research in the 1970s and 1980s.⁴³ Given the rapid advances in biotechnology throughout the 1990s, sustained public attention is long overdue. In order to broaden our perspective—from the moral status of embryos to the social consequences of manipulating human embryonic and genetic material—it is important to review synoptically the new opportunities for “survival” recently promised by scientists. Leading biotechnicians anticipate the development of radically expanded human capacities. As research into biotechnology and artificial intelligence advances, opportunities for negative immortality are becoming more concrete. Genetic replication and organ replacement are the two central projects of research into life-extension. They are amplified in artificial intelligence research into deathless vehicles for the mind.

A. Organ Replacement

The quest for a permanently preserved body has long been mocked. Woody Allen's film *Sleeper* lampooned cryogenic fantasies of the 1970s. The technical clumsiness of the procedure, along with some early mishaps, made it an easy target for derision.⁴⁴ Just as the myth of Tithonus served as a cautionary tale in ancient Greece,⁴⁵ modern satirists have mocked the egotistical for technological overreaching.

Now scientists and journalists are not nearly as dismissive of projects with eerily similar aspirations.⁴⁶ The promise of scientifically verified immortality has gained credibility with every successful

43. For academic analyses of these debates, see ROGER SHATTUCK, *FORBIDDEN KNOWLEDGE: FROM PROMETHEUS TO PORNOGRAPHY* 176 (1996); LANGDON WINNER, *AUTONOMOUS TECHNOLOGY* (1976); and LANGDON WINNER, *THE WHALE AND THE REACTOR* (1984).

44. See JOHN BOWKER, *THE MEANINGS OF DEATH* 3-5 (1991) (discussing the “Cryonics Society of California”).

45. In Greek myth, Tithonus wished for immortality, but not for youth, and eventually withered into the shape of a grasshopper. See EDITH HAMILTON, *MYTHOLOGY* 428 (1942).

46. See, e.g., Stephen S. Hall, *Racing Toward Immortality: The Recycled Generation*, N.Y. TIMES, Jan. 30, 2000 (Magazine), at 30; Brian Alexander, *Don't Die, Stay Pretty*, WIRED, Jan. 2000, at 178-87.

organ transplant.⁴⁷ Nevertheless, limited organ availability, immune system incompatibilities, and technological limits on the chemical synthesis or simulation of tissues seemed insuperable difficulties to the “organ replacement” project.

Recent stem-cell research has led scientists to predict the manufacturing of a “cell so protean and potent that it could theoretically generate an infinite supply of replaceable body parts—organ and skin, sinew and bone, blood and brain—to knit the tatters of disease, injury or old age.”⁴⁸ Not only organ regeneration but also synthetic manufacture of human tissues have led many to speculate about indefinite prolongation of life.⁴⁹ These projects are not mere science-fiction fantasies: patents and licensing agreements are already in place for each.⁵⁰

B. Genetic Replication via Cloning

Cloning has raised similar, if less widely shared, enthusiasm. Brigitte Bosselier, a leader of a pro-cloning cult (the “Raelians”), has spoken of cloning as a gift from God. She sees the procedure as a chance at self-perpetuation that would realize here and now the world religions’ promises of eternal life.⁵¹ Her chiliastic group has even recruited dozens of women to gestate potential clones.⁵² Grieving persons with perished relatives have approached the Raelians and cloning scientists in order to “regenerate” lost kin.

47. Furthermore, “in the next three decades, medical science will move beyond the practice of transplantation and into the era of fabrication. The idea is to make organs, rather than simply to move them.” Robert Langer & Joseph Vacanti, *Artificial Organs*, SCI. AM., Sept. 1995, reprinted in *REVOLUTIONS IN SCIENCE: 13 CLASSIC ARTICLES FROM SCIENTIFIC AMERICAN* 56 (1999). Langer and Vacanti conclude that “[u]ltimately, tissue engineering will produce complex body parts such as hand and arms. The structure of these parts can already be duplicated in polymer scaffolding, and most of the relevant tissue types—muscle, bone, cartilage, tendon, ligaments, and skin—grow readily in culture.” *Id.*

48. Hall, *supra* note 46, at 31.

49. As Michio Kaku has written, “from now to 2020, perhaps the best bet in terms of delaying or maybe reversing some of the diseases or symptoms of aging will be carefully monitored hormone treatments After 2020 . . . when we have personalized DNA sequencing, an entirely new avenue will open up—i.e., identifying the fabled ‘age genes,’ if in fact they do exist [and shutting off their instructions to the body to age]. . . . From 2020 to 2050, yet another promising approach will open up: growing new organs. Already, skin and other tissues can be grown in the laboratory, and plans exist to grow entire organs, including kidneys, hearts, and even possibly hands.” MICHIO KAKU, *To Live Forever?*, in *VISIONS: HOW SCIENCE WILL REVOLUTIONIZE THE TWENTY-FIRST CENTURY* 202 (1997).

50. See Hall, *supra* note 46, at 32. Hall speculates that “you might one day donate a snippet of your own skin, allowing scientists to harvest stem cells that theoretically would become a self-generated and limitless supply of transplant tissue—tissue that would make a perfect immunological match.” *Id.*

51. See Talbot, *supra* note 8, at 41 (quoting the founder of the Raelian sect, who claims that “technology is not only technology but an extension of our spiritual life”).

52. *Id.*

Their goal may strike many as bizarre. A person cannot be reduced to his body, much less to the genetic code that shaped its development. The latter is all that is replicated when someone is cloned. But as genetic explanations of human behavior gain popularity and predictive power,⁵³ perhaps we should not be surprised at increasing popular identification of the self with the body's basic building blocks.⁵⁴ Since "the genes we pass on to the next generation . . . may survive indefinitely into the future . . . we know that genes are in a sense 'immortal,'" bioethicist John Harris writes.⁵⁵ Harris's formulation suggests how medical technology can displace old desires for a divine afterlife. If genes are scientifically verified vehicles for immortality, a person might evade death by identifying with his genes.⁵⁶

C. Deathless Vehicles for the Mind

Mechanical organs and artificial intelligence offer another avenue to "negative immortality." Synthetic tissues may supplant stem cells with inorganic organs that replicate the inputs and outputs of the organs they replace. For example, an artificial pancreas might regulate insulin levels from within the body. Artificial intelligence offers even more exotic modes of self-preservation. Some scientists believe that they may find technical methods of "translating" the activities of the brain into some more durable medium. After soul has been reduced to self, self to mind, and mind to brain, this last step of understanding what the brain is as what it does appears plausible to many.⁵⁷ Consciousness, on this view, is software, a program that can

53. See JOHN HORGAN, *THE UNDISCOVERED MIND: HOW THE HUMAN BRAIN DEFIES REPLICATION, MEDICATION, AND EXPLANATION* 137-67 (1999) (describing expansive claims by behavioral geneticists who claim to have discovered genes responsible for alcoholism, criminality, and other traits); see also Evelyn Fox Keller, *Master Molecules*, in *ARE GENES US? THE SOCIAL CONSEQUENCES OF THE NEW GENETICS* 95 (Carl F. Cranor ed., 1994) (analyzing scientific rhetoric that has "done so much to support the rise of confidence in genetic determinism within popular culture").

54. See, e.g., EVELYN FOX KELLER, *REFIGURING LIFE* (1998). Keller argues that "we now have different ways of talking of the body (for example as a computer, an information-process network, or a multiple input-multiple output transducer) [and] because of the advance of the modern computer (and other new technologies), we now have dramatically new ways of experiencing and interacting with that body." *Id.* at 18.

55. JOHN HARRIS, *CLONES, GENES, AND IMMORTALITY: ETHICS AND THE GENETIC REVOLUTION* 7 (1998).

56. Rather like the man who, having lost his keys while walking down a dark street, looks for them only under lampposts because that is the only place he can see.

57. As Iris Murdoch comments, such is the influence of the modern scientific world view that common discourse now reflects the materialist view "that reality is finally a quantity of material atoms and that significant discourse must relate itself directly or indirectly to reality so conceived." IRIS MURDOCH, *EXISTENTIALISTS AND MYSTICS* 287 (1996). See also EDWARD S. REED, *FROM SOUL TO MIND: THE EMERGENCE OF PSYCHOLOGY* (1994). There is an intimate connection between reductionism, materialism, and behaviorism. See DANIEL N.

be run on any hardware as intricate as a human brain.⁵⁸ In theory, a silicon-and-wire computer could preserve someone's consciousness by running "their" program.⁵⁹

III. POSITIVE IMMORTALITY

Dead, you are no longer around . . . and if there is nowhere else you'll be (heaven, hell, with the white light) then all that will be left of you is your effects, leavings, traces. People do seem to think it important to continue to be around somehow. . . . A significant life is, in some sense, permanent. . . . [I]t leaves traces.

—Robert Nozick, *Philosophical Explanations*⁶⁰

Writing two millennia ago, the Latin poet Horace prophesied for himself (a kind of) immortality. At the conclusion of three volumes of stylized meditations on civilization and nature, he closed his magnum opus with braggadocio. Abandoning Roman norms of deference, he predicted that his work would outlast the monuments of his patrons: "Exegi monumentum aere perennius."⁶¹ The prediction has come true—Horace has found immortality (at least in classics departments).

Like Horace (albeit usually in humbler ways), persons in countless ages and places have responded to their own finitude by identifying with timeless roles, goals, and institutions. In the West, these cultural responses to death can be usefully classified into two camps: religious and secular humanism. Since the Enlightenment, these humanisms have developed widely divergent views on mortality. Secular humanists have often characterized theistic beliefs in an afterlife as self-delusion or distraction. But the inarticulacy of their own attitudes toward death threatens to undermine the very ideals they seek to advance. The common ontological ground of secular humanist and religious thought on immortality only comes into focus with the ad-

ROBINSON, AN INTELLECTUAL HISTORY OF PSYCHOLOGY (1993).

58. See HORGAN, *supra* note 53, at 201 ("According to the strong artificial intelligence program there is no fundamental difference between computers and brains: a computer is different machinery than a person in terms of speed and memory capacity.")

59. RAYMOND KURZWEIL, *THE AGE OF SPIRITUAL MACHINES* 65 (1999).

60. ROBERT NOZICK, *PHILOSOPHICAL EXPLANATIONS* 582 (1984).

61. Roughly translated, "I have built a monument more lasting than bronze." HORACE, *ODES*, III.30. Horace's hopes are echoed in countless writers. As Faulkner has claimed, "[The writer] knows he has a short life span. The day will come that he must pass through the wall of oblivion and he wants to leave a scratch on the wall—Kilroy was here—that someone a hundred or a thousand years later will see." ROBERT JAY LIFTON, *The Future of Immortality*, in *THE FUTURE OF IMMORTALITY AND OTHER ESSAYS FOR A NUCLEAR AGE* 12 (1987) (quoting WILLIAM FAULKNER, *FAULKNER IN THE UNIVERSITY* (1959)).

vent of scientific efforts to do away with death altogether.⁶² These scientific efforts can, in turn, only be understood in the context of historical human yearnings for immortality.

A. Religious and Secular Humanism

Devout Christians, Jews, and Muslims have understood earthly life as a prelude to the next.⁶³ The children of God are counseled to be in, but not of the world. The exile of the Israelites in the Hebrew Bible mirrors man's status as a sojourner on earth.⁶⁴ St. Francis of Assisi counseled Christians to pray that the constellation of paradoxes that is Christian belief would culminate in miraculous transformation at death:

For it is in giving that we receive,
in forgiving, that we are forgiven,
and in dying that we are born to eternal life.⁶⁵

While mourned in Christian ritual, death is celebrated in its dogma and prayers as a passageway to a better life. Similarly, in Islam, "life is a gift from Allah and when the Appointed Time comes, the individual departs from this World bound for a rendezvous with his Maker in the hereafter."⁶⁶ For all of the "Abrahamic traditions," the afterlife is a central article of faith.

Modern secular ideologies began as a reaction against these religious traditions. They sought to elevate the human by discrediting the supernatural. Particularly galling to many progressives was the way in which otherworldly aspirations could distract the afflicted

62. As Hegel observed, the owl of Minerva flies at dusk. In other words, we are only capable of defining what man is when we are faced with the "death of man" (in Foucault's terms) or "abolition of man" (in C.S. Lewis's). See MICHEL FOUCAULT, *THE ORDER OF THINGS: AN ARCHEOLOGY OF THE HUMAN SCIENCES* 385-87 (1970); C.S. LEWIS, *THE ABOLITION OF MAN* 68 (1943) (arguing that "all possible future generations [may be the] patients or subjects of a power wielded by those already alive . . . [by] means of selective breeding").

63. It might be more appropriate for me to discuss all world religions here, since "the belief in a reembodyment of the dead is still officially obligatory for all Zoroastrians, Jews, Muslims, Christians, Hindus, and Buddhists." Sulayman S. Nyang, *The Teaching of the Quran Concerning Life after Death*, in *DEATH AND IMMORTALITY IN THE RELIGIONS OF THE WORLD* 71 (Paul Badham & Linda Badham eds., 1987) (quoting Arnold Toynbee, *Introduction to ARNOLD TOYNBEE & ARTHUR KOESTLER, LIFE AFTER DEATH* 29 (1976)). I am only discussing these three "peoples of the book" because the nature of the afterlife in other world religions is quite different from the conception common to the "Abrahamic traditions."

64. Daniel Cohn-Sherbok, *Death and Immortality in the Jewish Tradition*, in *DEATH AND IMMORTALITY IN THE RELIGIONS OF THE WORLD*, *supra* note 63, at 24.

65. ADRIAN HOUSE, *FRANCIS OF ASSISI: A REVOLUTIONARY LIFE* (2000) (quoting St. Francis of Assisi's *Prayer of St. Francis of Assisi*); see also G.K. CHESTERTON, *ST. FRANCIS OF ASSISI* (1924).

66. Sulayman S. Nyang, *The Teaching of the Quran Concerning Life After Death*, in *DEATH AND IMMORTALITY IN THE RELIGIONS OF THE WORLD*, *supra* note 63, at 73. Nyang notes that the term *al-akhirah* (the hereafter) appears 113 times in the Quran. *Id.*

from fighting for a better lot here on earth.⁶⁷ Carrying on the Enlightenment's attack on traditional conceptions of immortality, Brecht insisted that "you die like animals / and nothing comes after."⁶⁸ By characterizing their worldly aims as "all there is," artists, writers, and revolutionaries sought to invest them with something like the religious devotion once directed to the divine.

The secular reaction against religious authority led to some obvious mischaracterizations of religious aims. Few religious leaders were entirely focused on the eternal. Most premised its achievement on the conformance of one's life on earth to a set of timeless standards deemed entirely consonant with *human* flourishing. Presently, nearly all Christian denominations and Jewish and Muslim movements complement the imperative of personal rectitude with an obligation to improve society at large.

Nevertheless, the struggle between believers and their "cultured despisers" over the significance of death has transformed the West. After losing his faith, Ludwig Feuerbach announced that "the purpose of my writings . . . is to turn men from theologians into anthropologists, from theophilists to philanthropists . . . from religious and political lackeys of the heavenly and earthly monarchy into free, self-confident citizens of the world."⁶⁹ Feuerbach's secular sensibility permeates much of the West.⁷⁰ Enlightenment rationalism now dominates high culture, while demotic skepticism undermines the initiatives of the pious. Theologians are embarrassed to be "raising the question of eternal life at a time when a completely new scientific world vision has come to prevail . . . and there is no longer any eternal truth that can evade the critical judgment of reason by an appeal merely to the authority of Bible, tradition, or Church."⁷¹ The procedural generation of norms through the market and democracy

67. Max Weber explores this possibility systematically in his discussion of compensational theodicy (which rationalizes the plight of the poor to the poor by assuring them that their misery will in some way earn them a joyful afterlife) and legitimational theodicy (which rationalizes the privilege of the powerful as a reflection of God's intention for the world). See generally MAX WEBER, *ECONOMY AND SOCIETY* (H.H. Gerth & C. Wright Mills trans., 1953) (1913).

68. HANS KUNG, *ETERNAL LIFE? LIFE AFTER DEATH AS A MEDICAL, PHILOSOPHICAL, AND THEOLOGICAL PROBLEM* 23 (1982) (quoting BRECHT, *Against Seduction*, in *HOMILIES FOR THE HOME*); see also FRIEDRICH NIETZSCHE, *On the Other-Worldly* and *On the Virtue that Makes Small*, in *THUS SPOKE ZARATHUSTRA* 114, 187 (R.J. Hollingdale trans., 1969) (1883).

69. KUNG, *supra* note 68, at 29 (quoting LUDWIG FEUERBACH, *THE ESSENCE OF CHRISTIANITY* 12 (George Eliot trans., 1957) (1841)).

70. Feuerbach's views and influence are also lucidly explained in Ninian Smart's discussion of atheism and agnosticism. NINIAN SMART, *THE RELIGIOUS EXPERIENCE OF MANKIND* 557 (3d ed., 1984) (observing that "in the modern period . . . powerful restatements of atheism and agnosticism have had wide success"); see also ROBERT COLES, *THE SECULAR MIND* (2000).

71. KUNG, *supra* note 68, at 6.

has swept away substantive traditions and “superstition.” Both have cleared room for new ideals to inform the self-images of the age.

Intellectual historians have well-chronicled the displacement of religious humanism by secular thought. Central to the story are the following closely linked ideas:

- 1) that for us, life, flourishing, and driving back frontiers of death and suffering are of supreme value; 2) that this wasn't always so; it wasn't so for our ancestors, or for people in earlier civilizations; 3) that one of the things that stopped it from being so in the past is precisely a sense, inculcated by religion, that there were higher goals; and that we have arrived at 1) by a critique and overcoming of (this kind of) religion.⁷²

Charles Taylor styles this “metaphysical primacy of life” in the new humanism as a revolution in our “moral sources,” the basic ideas that motivate human action and aspiration. Like most revolutions, it has tried to root out the old regime.

But the secular humanist reaction against theistic belief in an “afterlife” may be self-defeating. For while the intellectual conflict between theism and secular humanism has dominated contemporary Western thought on death, it does not exhaust our cultural responses to mortality. Persons may also approach death with an anti-humanist or post-humanist mentality. New efforts to “conquer death” through science—either through the artificial intelligence or biotechnology—constitute a radical challenge to both religious and secular humanist responses to death.⁷³ They threaten to render the universal ethical standards of religious and secular humanisms secondary to the individual pursuit of indefinite survival.

Many progressives scoff at the “immortality project” as one more distraction from an ethical life, one more lure to the selfish concern for self-preservation they see at the root of religious concerns for an afterlife. Nevertheless, they are also challenged to give a fuller account of the positive immortality that renders scientific efforts to extend one's own life less urgent than the leading of a good one. Despite secularists' expressed disdain for the very idea of eternal life, they tend to offer “reassurances that compensate for those lost with the death of God.”⁷⁴ Chief among these “reassurances” is the idea

72. Charles Taylor, *A Catholic Modernity?*, in *A CATHOLIC MODERNITY?* 24 (James Heft ed., 2000).

73. See Jedediah Purdy, *The God of the Digerati*, AM. PROSPECT, Mar./Apr. 1998, at 34-40, available at <http://www.prospect.org/print/V9/37/purdy-j.html>. As Purdy notes, the biotechnological avant-garde is happy to permit “the strongest individuals . . . [to] create new myths [and] remake themselves [with] expensive biological and electronic advances that promise people the capacity to tinker with themselves in unprecedented ways.” *Id.*

74. *Id.* at 16.

that, by identifying with a certain role, goal, or conception of the good, one has identified the self with something that will outlast it. Timelessness remains an indispensable feature of normativity.

On Benedict Anderson's account of nationalism, the rise of the "imagined community" of the nation-state was possible only because similar structures of collective consciousness had already been inculcated by Western Christendom.⁷⁵ Where the latter promised immortality to persons, the former was premised on the greatness and permanence of a people. Similarly, the "affirmation of ordinary life" in early Protestantism became the basis for the modern renewal of familism—a sense of achieving immortality through one's descendants.⁷⁶ By promising self-understanding in the face of the body's inevitable decomposition, the ethical ideals of secular humanists from Voltaire to Dawkins mirror religious economies of salvation.⁷⁷ By doing the right, by recognizing "reality," one can integrate one's own life into a fabric of significance greater than the self.

B. Socially Recognized Versus Scientifically Verified Survival

Admittedly, one cannot attribute to all humanist ideologies similar structures of motivation regarding ultimate concerns. Anarchists and hedonists do not obviously mirror religious modes of thought. But such secular philosophies, like others less individualistic in tone, nevertheless share the ontological presuppositions of the world religions: a community of humans all facing death. For all of them,

75. BENEDICT ANDERSON, *IMAGINED COMMUNITIES* (1994).

76. See CHARLES TAYLOR, *SOURCES OF THE SELF: THE MAKING OF MODERN IDENTITY* (1994). Taylor uses "ordinary life" as a term of art to

designate those aspects of human life concerned with production and reproduction, that is, labor, the making of the things needed for life, and our life as sexual beings, including marriage and the family. When Aristotle spoke of the ends of political association being "life and the good life" (*zen kai euzen*), this was the range of things he wanted to encompass in the first of these terms; basically they englobe what we need to do to continue and renew life.

Id. at 211. To Aristotle, the good life included "delibera[tion] about moral excellence . . . [and] contemp[lation of] the order of things." *Id.* To later churchmen, the highest station in society was the religious life. These "influential ideas of ethical hierarchy exalted the lives of contemplation and participation." *Id.* But the rise of bourgeois power led to a transvaluation of values, whereby the economy and family became objects of devotion worthier than the state and the church. As in early Biblical times, descendants (and devised property) became a concrete token of one's immortality. Children and wealth supplanted glory and holiness as a means—but the end remained the same.

77. As Alan Harrington has observed, "The voices of Islam, Judaism, Christianity, and atheism join as one. Massed units in Red Square as well as Vatican City combine their energies in a single mighty appeal: Save Us. For the beauty and cruelty in the world, the kindness and the murder; our art trying to illuminate this wilderness; speculations of philosophers; and the descent into drugs and drunkenness . . . all are organized around death, and designed to protect each of us from annihilation here or elsewhere." ALAN HARRINGTON, *THE IMMORTALIST* 10 (1969).

“foreknowledge of death . . . encourage[s] a human being to establish priorities in life.”⁷⁸ Simply because doctors had neither the tools nor the credibility to promise negative immortality before the present, all humanisms predating our time had to assume their addressees would die. Death was an essential feature of the horizons of significance shared by all serious thinkers. Therefore humanists, be they secular or religious, aspired to articulate a vision of “positive immortality”: a standard of ethics or achievement against which a person’s life could be judged timeless.

Perhaps positive immortality arose only as a sublimated hope for an everlasting body. But its varied manifestations have persisted because the dream of endless this-worldly embodiment has been presumed to be impossible. Individuals pursue positive immortality with words and deeds because (a) they recognize a past and admire those of its figures who have made lasting contributions to society, and (b) they could reasonably assume a future whose inhabitants (or another world whose God) could similarly approve them. As negative immortality becomes a more plausible dimension of the future, the reasoning in (b) becomes less and less convincing. Individuals are left with a stark choice: to identify with the roles bequeathed by the past (be they writers, businessmen, religious devotees, philanthropists, or whatever), or to strive for a status that renders the past trivial with its promise of indefinite extension of life into the future.

Positive immortality is premised on a common human history, some faith that the assembled beliefs and testimonies of the past speak to a self who can in turn testify to the future. As Henri Pirenne argues,

All historical . . . narrative . . . rests upon a postulate: that of the eternal identity of human nature. One cannot comprehend men’s actions at all unless one assumes that their physical and moral beings have been at all times what they are today. Past societies would remain unintelligible to us if the natural needs they experienced and the psychical forces which stimulated them were qualitatively different than our own.⁷⁹

78. WILLIAM CONNOLLY, *IDENTITY/DIFFERENCE: DEMOCRATIC NEGOTIATIONS OF POLITICAL PARADOX* 17 (1993). Connolly acknowledges his debt to Heidegger, who offers seminal explorations of the place of death in human consciousness. See Ethan J. Leib, *Authentic Falling: Heidegger’s Paradox?*, 4 SYMPOSIUM: J. CAN. SOC’Y FOR HERMENEUTICS & POSTMODERN THOUGHT 71, 88 nn.28 & 29 (2000) (arguing that, for Heidegger, a person’s (*Dasein*’s) being “thrown into the possibility of [her] own death . . . supports all other possibilities of *Dasein* because *Dasein*’s death in each case must be [her] own . . . Being-thrown-towards-death is the primary way that *Dasein* has the possibility for individuation because death is in each case *Dasein*’s own”).

79. Henri Pirenne, *What Are Historians Trying to Do?*, in *THE PHILOSOPHY OF HISTORY IN OUR TIME* 232 (Hans Meyerhoff ed., 1959).

Pirrenne's account of the presuppositions of our understanding of the past also applies to the future's understanding of us. We fear that a future human race of *übermenschen* simply would not be able to understand life as we experienced it. That particular variety of non-being (or non-influence) creates in us the same anxieties we imagine in constitution writers (when we deviate from the "original intent") or judges (when we overrule precedential authority). The moral force of tradition results from our reluctance to compromise the significance of our forbears' legacy unnecessarily. We hope for the same regard from our progeny, even as we fear that "children picking up our bones . . . least will guess that with our bones / we left much more, left what still is / the look of things, left what we felt / And what we saw."⁸⁰ Technology that renders their experience qualitatively different from our own alienates us from the future, and renders trivial our efforts to build a better one.

Concededly, the same could be said in a formal sense about nearly all technology. The printing press, the car, birth control, all changed lives so dramatically that it might be hard for those living after them to understand how their predecessors ever did without. But that sense of distance from the past is itself rooted in a presumed commonality of physical response. We can try to imagine what it would be like if we lacked some technology, and put ourselves in the place of those who came before it. By contrast, mortality from the perspective of immortality is as unimaginable as drunkenness is to someone who has always been sober. Olaf Stapledon suggested that "beneficiaries" of negative immortality might "refresh their spirits with a 'Cult of Evanescence,' a form of religious or artistic creation in which the tragedy and beauty of short-lived creatures is given the highest value . . . [which] connect[s] a computerized and intellectualized species with the ancient realities of life and death."⁸¹ But what catharsis would result from such tragedy? What identification with the past would be possible? As Cynthia Ozick suggests, in such a future, "sight and insight, inner and outer, sweet and salt, are shuffled . . . all is ephemeral. There is no long and no short; there is only immeasurable isness."⁸² The indefinite future negative immortality promises would erase the past from any horizon of significance.

80. WALLACE STEVENS, *A Postcard from the Volcano*, in *POEMS OF WALLACE STEVENS* 71 (1965).

81. FREEMAN DYSON, *IMAGINED WORLDS* 160 (1997). Dyson here refers to an episode in Stapledon's futuristic novel, *Last and First Men*. In Stapledon's vision, a "future race" will be divided among those who "insist[] that the formal beauty of the universe demand[s] the tragic evanescence of all things, and those who [are] determined to show that living minds could actually reach back into past events in all their pastness." OLAF STAPLEDON, *LAST AND FIRST MEN* 237 (Dover Pub. 1976) (1930).

82. CYNTHIA OZICK, *THE PUTTERMESSER PAPERS* 234 (1997).

The conflict between positive and negative immortality does not simply exist at a conceptual level, but is evident in our culture. Like the corporations that employ, feed, and clothe most of us who are affluent enough to be offered visions of the new immortality, we increasingly seek unlimited life instead of the kinds of achievements that would make a limited life good or memorable. If we follow Phillip Rieff and define culture as a set of common understandings “consecrat[ing]” those “purposes alone in which the self can be realized and satisfied,”⁸³ we might term negative immortality a “symptom” of our culture, a sign of illness or imminent transformation.⁸⁴ Older aims pale in comparison with its promise of invulnerability.

IV. EVALUATING NEGATIVE IMMORTALITY

... Strip something
of its mortality, and how do you know
what's left to see?

—Mark Doty, *Lament-Heaven*⁸⁵

The promise of immortality—be it from priest or scientist—always deserves skepticism. Its offeror makes the grandest claim—not merely to provide one particularly valued experience, but to grant the opportunity to have them all. Heretofore those making such a grand promise—those offering positive immortality—have had to condition its achievement on a great sacrifice: the loss of one’s earthly existence. But now scientists are beginning to promise immortality in exchange for cash. How should we respond?

There are many different ways to evaluate negative immortality. Pragmatically, we might ask: does it work? As the discussion below indicates, current results are mixed. Deep technical problems plague even the most promising technologies of negative immortality. Nevertheless, a few decades ago authorities announced insuperable technical barriers to mapping the human genome and cloning mammals. Craig Venter and Ian Wilmut have proven those predictions wrong; technologies once deemed the province of science fiction are rendered feasible.⁸⁶ Furthermore, a combination of genetic,

83. PHILLIP RIEFF, *THE TRIUMPH OF THE THERAPEUTIC* 4 (1963).

84. I borrow the metaphor “symptom of culture” from Marjorie Garber’s book of the same name. MARJORIE GARBER, *SYMPTOMS OF CULTURE* 5 (1998) (explaining that “[desire] cries out in its symptom . . . [S]ymptoms, then are ways of speaking. And the analysis of symptoms is a reading practice.”).

85. MARK DOTY, *Lament-Heaven*, in *MY ALEXANDRIA* 85 (1996).

86. See GINA KOLATA, *CLONE: THE ROAD TO DOLLY AND THE PATH AHEAD* 22-47 (1998) (discussing Wilmut’s cloning of a sheep).

organ-replacement, and artificial-intelligence technologies might achieve what no particular one of them can do alone.

In any event, technological forecasting matters less to a discussion of the feasibility of negative immortality than does an awareness of the deeply value-laden quality of this supposedly “scientific” determination. Despite the efforts of Alan Turing and others to develop a “test” for determining when life is artificially generated,⁸⁷ debates continue as to the meaning of such tests. If individuals begin to identify with those aspects of themselves most tractable to preservation, they will ensure the success of new technologies of negative immortality. That incipient process raises another question: should individuals strive for the kind of self-preservation promised by negative immortality?

Critics of the “immortality project” have focused on the unintended consequences of regenerative medicine. After analyzing the critics’ arguments and appeals, I complement them with my own. I shall try to make the “unintended consequences” critique more immediate by examining the unexpectedly negative impact of a more proximate innovation: the precise manipulation of moods via drugs. Next, I render more relevant the projected dystopias of some of the new medicine’s critics by examining how its present distribution expresses the same normative commitments—to human inequality and moral irresponsibility—so memorably condemned in works such as *Brave New World*.

A. Is Indefinite Self-Preservation Possible?

Philosopher Bernard Williams has argued that one would only opt for negative immortality on two conditions: “that it should clearly be me who lives forever . . . [and] that the state in which I survive should be one which, to me looking forward, will be adequately related, in the life it presents, to those aims which I now have in wanting to survive at all.”⁸⁸ Bracketing the technological questions, Williams provides several grounds for believing that indefinite life cannot satisfy the second condition.⁸⁹ But once we face the concep-

87. Alan M. Turing, *Computing Machinery and Intelligence*, 59 MIND 433 (1950), reprinted in THE PHILOSOPHY OF ARTIFICIAL INTELLIGENCE 40-67 (Margaret A. Boden ed., 1992). A computer would “pass” the Turing Test if it could fool an interlocutor into believing that it is human. *Id.*

88. BERNARD WILLIAMS, *The Makropoulos Case*, in PROBLEMS OF THE SELF: PHILOSOPHICAL PAPERS 1956-1972, at 82 (1973).

89. Williams doubts that a negatively immortal man can bring a “later character and its desires into a relation to his present ones.” *Id.* He further charges that boredom “would be not just a tiresome effect, but a reaction almost perceptual in character to the poverty of one’s relation to the environment.” *Id.* These conclusions suggest that the classic grounds for skepticism about heaven—infinite boredom or the incomprehensibility of life “after life”—

tual assumptions of those advocating each of the paths to indefinite self-preservation mentioned above—cloning, organ replacement, and artificial intelligence—the first condition also appears unattainable.

Consider human cloning; this technology of negative immortality has raised the most public concern, but is also the most frequently misconceived.⁹⁰ Many advocates of cloning envision it as a method for individuals or couples unable to reproduce “naturally” to give birth to genetically related offspring. However, its most celebrated advocates are fringe groups that see it as a route to immortality—or at least a partial evasion of death. Brigitte Boisselier has promoted the procedure as a chance to resurrect loved ones.⁹¹ She included this excerpt from a parent desperate to clone DNA preserved from his dead child’s body:

I couldn’t accept that it was over for our child. . . . I would never stop until I could give his DNA—his genetic make-up—a chance. I knew that we only had one chance; human cloning. To create a healthy duplicate, a twin of our son.⁹²

According to Boisselier, hundreds of other parents have approached her with similar requests.

It is difficult to respond fairly to individuals who believe that they would resurrect a family member when they clone his or her DNA. Though only a molecule, DNA has taken on sacred importance to many:

Just as the Christian soul has provided an archetypal concept through which to understand the person and the continuity of the self, so DNA appears in popular culture as a soul-like entity, a holy and immortal relic, a forbidden territory. . . . DNA has taken on the social and cultural functions of the soul. It is the essential entity—the location of the true self—in the narratives of biological determinism.⁹³

might be turned against advocates of negative immortality. In this regard, consider Wallace Stevens: “Death is the mother of beauty; hence from her, / Alone, shall come fulfillment to our dreams / And our desires.” WALLACE STEVENS, *Sunday Morning*, in *THE EMPEROR OF ICE CREAM AND OTHER POEMS* 8 (Bob Blaisdell ed., 1999).

90. See, e.g., LORI ANDREWS, *THE CLONE AGE: ADVENTURES IN THE NEW WORLD OF REPRODUCTIVE TECHNOLOGIES* 237-260 (1999) (describing the Raelians and aspiring cloning entrepreneurs).

91. See Talbot, *supra* note 8, at 41.

92. *Issues Raised by Human Cloning Research: Hearing Before the Research Subcommittee on Oversight and Investigations of the House Energy and Commerce Comm.*, 107th Cong. 55 (2001) (statement of Brigitte Boisselier, Medical Director of Clonaid) (quoting an anonymous father who had approached her organization in order to clone the DNA of his deceased son).

93. DOROTHY NELKIN & M. SUSAN LINDEE, *THE DNA MYSTIQUE: THE GENE AS A CULTURAL ICON* 42-2 (1995).

In light of the First Amendment's free exercise clause, such belief might render suspect any Congressional regulation of the practice. The Raelians' belief in resurrection via cloning is no less incredible, considered in isolation, than, say, the Roman Catholic belief in the transubstantiation of the host at Mass.⁹⁴ But neither is it any more scientifically verifiable.

Whereas cloning offers immortality to persons who identify totally with their genes, naturally cultured and synthetically manufactured organs promise an indefinite home for the brain. As medical research in each field advances, the promise of regenerative therapies has given new urgency to once-speculative philosophical questions. If you could transplant your brain from your body to another, would you be the same person?⁹⁵ What if you continually replaced body parts as you aged? These questions are now raised in the media as ways of thinking through the challenges posed by the new technologies.

Each case can illuminate our intuitions in some way—we can certainly imagine that if Henry's brain is transplanted into Jack's body, we're more likely to think that the "resulting person" is Henry (with a different body) than Jack (with a different brain).⁹⁶ The pattern of memory and desire we call "mind" is more important to identity than the physical presence of the body.⁹⁷ But we also imagine that this resulting person would likely sense things differently now that he has a different body. So is the resulting person Henry with a new body, or Jack with a new brain?

94. And yet viewing that belief in isolation is surely the quickest route to misunderstanding the matter. Most religious accounts of miracles and resurrections are tied to larger narratives about morality, obligation, grace, and virtue. The raising of Lazarus—which the aggrieved father mentioned above quoted in his testimonial as religious justification for his cloning efforts—comes in the midst of a narrative designed to get people to lead better lives, and to sacrifice in doing so. While one may imagine the Church of the Clones eventually supplanting the Church of Rome, it is hard to see how Judeo-Christian ideals of universal benevolence could find a place in a movement so assiduously devoted to the perpetual propagation of one's own genetic material.

95. Such hypothetical questions are a staple subject of contemporary philosophical discussions of personal identity. See, e.g., BERNARD WILLIAMS, *Personal Identity and Individuation*, in *PROBLEMS OF THE SELF: PHILOSOPHICAL PAPERS 1956-1972*, supra note 88, at 1; ANDREW BRENNAN, *CONDITIONS OF IDENTITY 1-10* (1988); TERENCE PENELHUM, *SURVIVAL AND DISEMBODED EXISTENCE* (1970); DEREK PARFIT, *REASONS AND PERSONS* (1986); and PETER UNGER, *IDENTITY, CONSCIOUSNESS AND VALUE* (1990). Parfit argues that "X today is one and the same person as Y at some past time if and only if [1] enough of Y's brain [to be the brain of a living person] continued to exist, and is now X's brain, and [2] there does not exist a different person who also has enough of Y's brain." *Id.* at 204.

96. See also *id.* at 245-80 (discussing analogous case of "Charles and Robert").

97. But even this assertion is contestable. Certainly on a day-to-day basis, the resulting person may have an easier time convincing acquaintances that he is Jack. But close friends and family would realize the difference rather quickly. That is, those who "really know" Jack would know that the resulting person is not he. Such speculations indicate how quickly efforts to define what identity *is* become debates over what identity *ought to be*.

The skeptical gerontologist Paul Hayflick illuminates the risks inherent in the projects of immortality, warning that we might lose our identity in the biological shuffle: "Given the possibility that you could replace all your parts, including your brain, then you lose your self-identity, your self-recognition. You lose who you are! You are who you are because of your memory."⁹⁸ An Augustinian might object that our identity is wrapped up not merely in our memory, but also in our intellect and will.⁹⁹ But these seem even less tractable to biological transfer than memory is. Even if a person ordered replacements for all his or her other "parts," a brain replacement would render this individual a new person.¹⁰⁰ Such immortality would clearly fail the first prong of Nagel's test for desirable models of immortality—namely, that the one choosing the model would remain the same person.¹⁰¹

Lingering suspicions about the durability and transferability of cerebral "wetware" have led many scientists and philosophers into artificial-intelligence research in order to search for inorganic substrates for the mind. Just as physics promises that we can analyze any physical system down to its smallest, (sub)atomic parts, the artificial-intelligence program is premised on a reduction of our beliefs and dispositions into declarative sentences and software code.¹⁰² Donna Haraway observes that "communications sciences and modern biologies are constructed by a common move—the translation of the world into a problem of coding, a search for a common language in which all resistance to instrumental control disappears and all heterogeneity can be submitted to disassembly, reassembly, invest-

98. Hall, *supra* note 46, at 31.

99. As Garry Wills explains, in Augustine's writings, "[t]he three aspects of memory-time (anticipation of the future, present attention, and memory) have the dynamic found in the soul's three faculties of will (toward action), intellect (of articulated reality), and memory (establishing identity)." GARRY WILLS, SAINT AUGUSTINE 97 (1999).

100. This objection to the very imaginability of immortality dates back at least to William James, who began a lecture on immortality by asking, "How can we believe in life hereafter when Science has once for all attained to proving, beyond possibility of escape, that our inner life is a function of that famous material, the so-called "gray matter" of our cerebral convolutions? How can the function possibly persist after its organ has undergone decay?" WILLIAM JAMES, HUMAN IMMORTALITY: TWO SUPPOSED OBJECTIONS TO THE DOCTRINE (1897), available at <http://www.hds.harvard.edu/library/ingersoll/1897lecture.html>. James subsequently defended the idea of a supernatural consciousness supervenient upon (or "transmissively" caused) by the brain. *Id.*

101. SHERRY TURKLE, LIFE ON SCREEN: IDENTITY IN THE AGE OF THE INTERNET (1995). *But see* HUBERT DREYFUS, WHAT COMPUTERS STILL CAN'T DO: A CRITIQUE OF ARTIFICIAL REASON (1998).

102. For example, Bernard Williams believes that one would only opt for (negative) immortality on two conditions "that it should clearly be me who lives forever . . . [and] that the state in which I survive should be one which, to me looking forward, will be adequately related, in the life it presents, to those aims which I now have in wanting to survive at all." WILLIAMS, *supra* note 88, at 82.

ment, and exchange.”¹⁰³ For example, if someone asked me “who are you?” I might attempt to “code” myself into a series of sentences about my past actions: I am the being who does *x* when *y* occurs. Looking back at my past, we might be able to discern some algorithms or decision mechanisms that emerge in my responses to stimuli. Some computer scientists believe that, as soon as we acquire enough computing resources, and enough surveillance to ensure that we know everything about the past of the person who wishes to be “downloaded,” we can sufficiently model his personality in software.

But even if we assume massive advances in computing, would “you” really be preserved if you could download your consciousness—or at least your characteristic pattern of observed response and mental processes—into a computer?¹⁰⁴ Just as the physicists’ dream of a unified scientific field, explicable solely with reference to “elementary particles,” has been mired in the multiplication of rival theories, so too has the artificial-intelligence program been rendered increasingly unrealistic by theoretical obstacles.¹⁰⁵ Although re-

103. DONNA HARAWAY, *SIMIANS, CYBORGS, AND WOMEN: THE REINVENTION OF NATURE* 164 (1991). As Mark Kingwell explicates this point, “[i]f everything were translatable into, say, digital code—including the idiosyncratic clusters of genetic information we call persons—then everything would be made disposable, not in the sense of being destined to be thrown away, but in the sense of being available for any kind of redeployment. . . . [Such] reductionism . . . reduces the number of meaningful ways we have to talk about the world. And that makes the world a poorer place.” Mark Kingwell, *What Does It All Mean?*, WILSON Q, Fall 2002, available at <http://wwics.si.edu/outreach/wq/WQSELECT/KINGWELL.HTM>; see also *THE CODE OF CODES: SCIENTIFIC AND SOCIAL ISSUES IN THE HUMAN GENOME PROJECT* (Daniel J. Kevles & Leroy Hood eds., 1992); EVELYN FOX KELLER, *REFIGURING LIFE: METAPHORS OF TWENTIETH-CENTURY BIOLOGY* (1996).

104. According to one of his critics,

Alan Turing, one of the founders of modern computation, was fascinated with how the distinction between software and hardware illuminated immortality. Turing’s friend Christopher Morcom had died when they were teenagers. If Morcom’s continued existence depended on his particular embodiment, then he was gone for good. But if he could be instantiated as a computer program (software), Morcom’s particular embodiment (hardware) would be largely irrelevant.

William A Dembski, *Are We Spiritual Machines?*, *FIRST THINGS*, Oct. 1, 1999, at 25.

105. See BERNARD PULLMAN, *THE ATOM IN THE HISTORY OF HUMAN THOUGHT* (1998). Pullman notes that “[t]he atomic theory provided a battleground for a clash of ideas spanning twenty-five centuries of the history of human thought.” *Id.* at ix. However, by the early twentieth century, physicists began to feel that “whether we take electrons, light quanta, benzol molecules, or stones, we shall always come up against these two characteristics, the corpuscular and the undular”—that is, that there were no elementary particles, only ultimately undiscoverable combinations of particles and waves, at the base of physical reality. *Id.* at 273. Similarly, the strong AI program aspired to “atomize” human thought into the “software” of descriptive code, but has run up on the shoals of the dynamic, “wavelike” character of human thought. Like quantum physics, it also stumbles on the inextricable interrelationship of observer and observed. For, as Searle argues, “The aim of natural science is to discover and characterize features that are intrinsic to the natural world. By its own definitions of computation and cognition, there is no way that computational cognitive science could ever be a natural science, because computation is not an intrinsic feature of the world. It is assigned relative to observers.” JOHN R. SEARLE, *THE REDISCOVERY OF THE MIND* 212 (1999). In

searchers have designed a computer that can beat the world's best chess player, they are nowhere near consensus on what types of algorithms a computer with humanistic, "all-purpose" intelligence would need.¹⁰⁶ The proposed translation of persons into words, numbers, and algorithms, and the presumed fixation of those formulae into a non-carbon-based robot, appears impossible—not merely as a technical matter, but also in principle. Much of what makes us who we are consists of spontaneity rooted in *inarticulate* background assumptions, or tacit knowledge, about the world.¹⁰⁷ Since conversation and other basic human interaction involves "performances where an explicit definition of the problem seems beyond our capacity . . . [and] deploys skilled performances which are themselves not explicitly thematized," the strategic modes of artificial-intelligence "thinking" can never properly mirror the communicative nature of human interaction.¹⁰⁸ Humans are receptive to the world, altering their responses to it, and their rules for altering responses, as a result of encounters with others.¹⁰⁹ We can thematize dimensions of this "lifeworld," but we can never summarize it in one

other words, the idea of a general human intelligence depends upon the embodiment of that intelligence in human form.

106. As Horgan describes it, the artificial-intelligence movement aims to "build[] a computer with an all-purpose rather than highly specialized intelligence." HORGAN, *supra* note 53, at 215.

107. As Jon Elster has observed, the command "be spontaneous" is oxymoronic. JON ELSTER, *ULYSSES AND THE SIRENS* (1983). Applying continental philosophy to the problem of generating an "all-purpose intelligence" with the capability to set its own goals, John Horgan notes that "Heidegger . . . argued that would be extremely difficult to reproduce human perception and cognition with a formal, rule-based model. . . . [He] pointed out that rules rarely apply to all situations; each rule requires extra rules to determine whether the initial rule is relevant for the particular situation, thus creating an infinite regress of rules." HORGAN, *supra* note 53, at 210.

108. CHARLES TAYLOR, *Cognitive Psychology*, in 1 *PHILOSOPHICAL PAPERS*, *supra* note 4, at 188. Jürgen Habermas explains the distinction between communicative and strategic action as follows: "In communicative action a basis of mutually recognized validity claims is presupposed; this is not the case in strategic action. In the communicative attitude it is possible to reach a direct understanding oriented to validity claims; in the strategic attitude, by contrast, only an indirect understanding via determinative indicators is possible." JÜRGEN HABERMAS, *COMMUNICATION AND THE EVOLUTION OF SOCIETY*, 208 n.2 (1979).

109. In this sense the Gadamerian concept of the hermeneutical circle applies not just to interpretation, but to all human action. As William Eskridge explains,

The dynamic process of interpretation works thus: Upon our first approach to the text, we project our pre-understandings onto it. As we learn more about the text, we revise our initial projections, better to conform with the presumed integrity of the text as it unfolds to us. Essential to the interpreter's conversation with the text is her effort to find a common ground that will both make sense out of the individual parts of a text and integrate them into a coherent whole.

William Eskridge, *Gadamer / Statutory Interpretation*, 90 COLUM. L. REV. 609, 627 (1990).

fell swoop (as we would need to do in order to render it capable of replication).¹¹⁰

Another conceptual problem lies in the translation of experience, sensation, and memory into electrical impulses. The body may be a transducer,¹¹¹ but we are nowhere near to reducing each sensation and thought to a binarized, digital file of positive and negative electrical impulses. Some artificial intelligence researchers have responded to this problem with a behavioristic program; if persons are what persons do, close observation of a person can result in a device that perfectly mimics that person's responses to various situations.¹¹² Although some might call such a device a zombie or robot, its artificial-intelligence backers respond that this is unthinking discrimination. They argue that all verified communications of intelligence should count as intelligence.¹¹³

One group of such programmers have styled themselves "ontologizers"; they teach artificial-intelligence devices millions of commonsense rules with the aim of eventually investing them with a pattern of response indistinguishable from that of ordinary humans.¹¹⁴ One such device, Cyc, "knows" that "trees are usually outdoors, that once people die they stay dead, and that a glass filled with milk will be right side up, not upside-down."¹¹⁵ Cyc's inventors hope that advances in computing will eventually allow them to map out for it "human" responses to all conceivable situations. But its programmers are nowhere near reducing to rules the practical reason and constellation of tastes, sensations, and emotions that lead people to the decisions, whether grave or trivial (from vocational choice to tastes in music), that seem the hallmark of human agency.

Admittedly, we can no more define human agency scientifically than we can demonstrate conclusively that machines have it. Discussing how scientists evaluate the "humanity" of their artificial

110. Schutz and Luckmann define the "lifeworld" as "that province of reality which the wide-awake and normal adult simply takes for granted in the attitude of common sense. [It is the] unquestioned ground of everything given in my experience, and the unquestionable frame in which all the problems I have to deal with are located." JÜRGEN HABERMAS, 1 THE THEORY OF COMMUNICATIVE ACTION 129-30 (Thomas McCarthy trans., 1987) (quoting A. SCHUTZ & T. LUCKMANN, THE STRUCTURES OF THE LIFEWORLD 3-4 (1993)). Habermas explains that "only the context directly spoken to on a given occasion can fall into the whirl of problematization associated with communicative action; by contrast, the lifeworld always remains in the background." *Id.* at 130.

111. See DIANE ACKERMAN, A NATURAL HISTORY OF THE SENSES 308 (1993).

112. See STEVE GRAND, CREATION: LIFE AND HOW TO MAKE IT (2001).

113. See, e.g., Turing, *supra* note 87.

114. HORGAN, *supra* note 53, at 215; see also Clive Thompson, *The Know-It-All Machine: An Audacious Quest to Teach a Computer Common Sense*, LINGUA FRANCA, Sept. 2001, at 23; DREYFUS, *supra* note 101, at 10-30.

115. HORGAN, *supra* note 53, at 216.

intelligence creations, Sherry Turkle observes that “what is involved here is not a weighing of scientific theory but an appropriation of images and metaphors.”¹¹⁶ As cognitive scientists “disseminate the idea that machines may be able to think like people and that people may have always thought like machines,”¹¹⁷ the central philosophical question raised so far by artificial intelligence—can machines think?—becomes less important than the potential of artificial intelligence to force us to articulate our reasons for valuing *any* feature of the natural or built environment. Why, for example, do we now value humans more than computers? If someone (believes he has) preserved his consciousness on a machine, should the resulting (simulacrum of the) person have (some of) the rights of its creator?¹¹⁸ Taking up the challenge, Richard Posner observes that, eventually, “there will be computers that have as many ‘neurons’ as [humans], and the ‘neurons’ will be ‘wired’ similarly.” In such a case, Posner asks, should we be distressed at the thought of destroying a “conscious” computer?¹¹⁹

Posner wisely grounds his own response in a widely held intuition: “Most of us would think it downright offensive to give greater rights to . . . computers than to retarded people, upon a showing that . . . the computer has a greater cognitive capacity to profoundly retarded human being.”¹²⁰ But this is not simply a visceral response or brute affect; it is a signifying emotion, reflecting a deeper self-knowledge.¹²¹ No matter how highly we wish to value an artifact like a computer, our scale of values itself is parasitic on our embodied form. We sense, however inarticulately, that our centers of value cannot hold once the human person, as embodied presently, ceases to be the valuer. As Clifford Geertz has observed, man is a being “suspended

116. TURKLE, *supra* note 101, at 142.

117. *Id.*

118. Even these formulations are contestable empirically. Ask anyone with a broken stereo whether he plans on spending, say, the \$30 necessary to fix the device, as opposed to spending \$30 on providing food to a starving person, and they will likely go ahead and fix the hardware. One would need to be a hard utilitarian to condemn that action, but it raises questions about how closely our stated moral commitments match our lived experience.

119. Richard Posner, *Animal Rights*, 110 YALE L.J. 527, 531-32 (2001).

120. *Id.* at 532. *But see* Steven Goldberg, *The Changing Face of Death: Computers, Consciousness, and Nancy Cruzan*, 43 STAN. L. REV. 659 (1991) (identifying “self-consciousness” as the key criterion of human identity, and linking humans to computers via a Darwinian framework); Lawrence B. Solum, *Legal Personhood for Artificial Intelligences*, 70 N.C. L. REV. 1231 (1992) (arguing that just as “Christopher Stone brought questions of environmental ethics into focus by asking whether trees should have standing . . . artificial intelligences’ [potential] invocation of the individual rights provisions of the United States Constitution” poses fundamental questions for American law).

121. MARTHA NUSSBAUM, UPHEAVALS OF THOUGHT: THE INTELLIGENCE OF EMOTIONS 22 (2001) (discussing signifying emotions as “forms of judgment”).

in webs of significance,” largely of his own making.¹²² Far from being one of many potential transducers,¹²³ the body qua body is the only reliable vehicle for perceptions continuous with those we now experience.

B. Is Indefinite Self-Preservation Desirable?

At present, there are serious obstacles to the attainment of any particular vision of negative immortality. Each project seems to lack something essential to human agency. Artificial-intelligence projects are unconvincing because their products lack bodies, and therefore cannot experience the sense-perceptions that are fundamental to human consciousness. Given the inevitable decay and profound importance of the brain, perpetual rounds of organ replacement seem only to offer their beneficiaries a series of lives, and not really a chance to maintain a coherent one. Neither the inorganic nor the organic forms of immortality offered by these two families of technologies offers indefinite life that is recognizably human or continuous with that of the person who employs them.

However, it is by no means clear that a combination of such technologies would inevitably fail at what each individually appears incapable of accomplishing. As Diane Ackerman concludes her *Natural History of the Senses*:

The body is a transducer (from Latin, to lead across, transfer), a device to convert energy of one sort to energy of another, and that is its genius. Our bodies take mechanical energy and convert it to electrical energy. . . . The brain is silent, the brain is dark, the brain tastes nothing, the brain hears nothing. All it receives are electrical impulses—not the sumptuous chocolate melting sweetly, not the oboe solo like the flight of a bird, not the pastel pink and lavender sunset over the coral reef—only impulses.¹²⁴

If the pattern of such impulses could be systematically mapped, advanced sensory interfaces would permit “human thinking [to] merg[e] with the world of machine intelligence.”¹²⁵ If such transducers are developed, there will be “little difference between a

122. CLIFFORD GEERTZ, *THE INTERPRETATION OF CULTURES* 5 (1984) (arguing, along with Max Weber, that “man is an animal suspended in webs of significance he himself has spun . . . [and taking] culture to be those webs, and the analysis of it to be therefore not an experimental science in search of law but an interpretive one in search of meaning”).

123. See KELLER, *supra* note 54, at 18 (discussing scientific models of the human body as a multiple-input/multiple-output transducer).

124. *Id.* at 308.

125. KURZWEIL, *supra* note 59, at 234.

human who has upgraded her body and brain using new nanotechnology . . . and a robot who has gained an intelligence and sensuality surpassing her human creators.”¹²⁶ Such cyborgs would face no natural limit to their “lifespan.”

These creatures are obviously a long way off in the future, if they are possible at all. Nevertheless, they are useful objects to contemplate, as medical science pledges to push back the frontiers of death. What price would we pay for victory in the struggle?

1. *Philosophical Perspectives*

Immortality has been a continuous theme of the Western philosophical tradition.¹²⁷ Normative reflection on the topic has animated philosophy, fiction, and myth. In relating Odysseus’s refusal of Circe’s offer of a blissful, deathless existence, Homer expresses primordial reservations about such “elevation:”

Mighty goddess, do not be angry with me for this. I know very well myself that wise Penelope is less impressive to look upon than you in looks and stature, for she is a mortal, while you are immortal and ageless. But even so, I wish and long day in and day out to reach my home, and to see the dog at my return. And if again some god shall smite me on the wine-dark sea, I will endure it, having in my breast a heart that endures affliction.¹²⁸

A cynic might respond that Odysseus has simply learned to want what he has had to do; the refusal is nothing but a failure of the imagination. But it is certainly more than that: the devotion to Penelope is real. To leave her behind would be callous. And even if we imagined an Odysseus with neither home nor wife, the strange, Elysian immortality offered by Circe scarcely offers an option *to* a person, but rather *transforms* that person, obliterating connection to all that has gone before. A choice for immortality would elevate the capacity for pursuing projects above the ability to make one’s own life a coherent story.

Yet, despite all these reasons, Circe’s promise is still tempting, and Odysseus’s dilemma still real to us today. In justifying Odysseus’s

126. *Id.* at 148.

127. See, e.g., MORTIMER ADLER, *Immortality*, in I THE GREAT IDEAS: A SYNTOPICON OF THE GREAT BOOKS OF THE WESTERN WORLD 784-94 (Robert Maynard Hutchins, et al. eds., 1952) (outlining topics such as the fear of death, arguments for and against personal survival, the moral significance of immortality (as sanction or reward), and conceptions of the afterlife). For more contemporary perspectives, see JOHN MARTIN FISCHER, *Introduction: Death, Metaphysics, and Morality*, in THE METAPHYSICS OF DEATH 3-30 (John Martin Fischer ed., 1993).

128. HOMER, ODYSSEY, V.215-222 (A.T. Murray trans., 1919) (revised in 1995 by George E. Dimock).

response, Martha Nussbaum has explained that “Homeric heroes imagine their appropriate goal to be not immortal life, but the creation of a deathless record of excellence, of deeds or works through which they do in a sense make the world as it will be ever after.”¹²⁹ Again, a skeptic might respond that negative immortality would simply give a person a chance for more great acts. To this Nussbaum argues that “it is only when one gives up on the aspiration to external transcendence—realizing that one is not going to be immortal—that one will begin to pursue (with good results for the world) the other sort.”¹³⁰

Of course, the search for positive immortality does not always end with “good results for the world.” But Nussbaum suggests that it is only our own suffering that make us sensitive to the suffering of others. She has imaginatively vindicated traditions in Greek thought that identify human vulnerability to suffering and death as not merely challenges to, but also conditions of a genuinely moral life.¹³¹ Arguing that our “morality is a response to the fact of suffering,” Nussbaum asserts that “the human world is held together by pity and fellow-feeling.”¹³² It is easy to imagine the negatively immortal entirely unconcerned with the community, culture, family, and history—rendered irrelevant by their godly estate. In Heraclitus’s words: “Immortals are mortal, mortals immortal, living with respect to one another’s death, dead with respect to one another’s life.”¹³³ We might conclude by extension that a sense of human community is premised in part on a shared fate of death.

Leon Kass, chair of President Bush’s Bioethics Advisory Commission, has also addressed the ways in which “our finitude [is] good for us.”¹³⁴ He suggests that negative immortality would result in a boring dilettantism: “If the human life span were increased even by only twenty years, would the pleasures of life increase proportionately? Would professional tennis players really enjoy playing twenty-five

129. MARTHA NUSSBAUM, *LOVE’S KNOWLEDGE: ESSAYS ON PHILOSOPHY AND LITERATURE* 381 (1990).

130. *Id.* at 382.

131. In the *Nicomachean Ethics*, Aristotle observes that a divine being would not be capable of many human virtues because it would not experience the temptations that divert us from virtue. ARISTOTLE, *NICOMACHEAN ETHICS* 1178b10-16 (Terence Irwin trans., 1985). Nussbaum observes that “important constituents of human *eudaimonia* cannot be found in a life without shortage, risk, need, and limitation. Their nature and their goodness are constituted by the fragile nature of human life.” MARTHA NUSSBAUM, *THE FRAGILITY OF GOODNESS: LUCK AND ETHICS IN GREEK TRAGEDY AND PHILOSOPHY* 340 (1987).

132. NUSSBAUM, *supra* note 131, at 375.

133. Heraclitus fr. DK52 (quoted in NUSSBAUM, *supra* note 131, at 341).

134. Kass, *supra* note 26, at 22.

percent more games of tennis?"¹³⁵ Kass insists that we are often only prompted to seriousness, to commitment, by the sense that we may be wasting our limited span of years. Reflecting on Wallace Stevens's cryptic metaphor "Death is the mother of beauty,"¹³⁶ Kass writes that "only a mortal being, aware of his mortality and the transience and vulnerability of all natural things, is moved to make beautiful artifacts, objects that will last, objects whose order will be immune to decay as their maker is not."¹³⁷ Kass concentrates on the way in which a life gains meaning, and gives meaning to a goal, to the extent that it is sacrificed on the goal's behalf. In his words, "To be mortal means that it is possible to give one's life, not only in one moment, say, on the field of battle, but also in the many other ways in which we are able in action to rise above attachment to survival."¹³⁸

It is heartening to see a leading figure in public debate on medical research address philosophically the ultimate issues it raises. Kass's mix of aesthetic appeals and moral judgments is powerful. He demonstrates that the acceptance of death is not simply a complacency of the other-worldly, those consoled with faith in an afterlife designed to compensate for the loss of this one. Those questioning the biotechnological goal of "death to death" are more than a sectarian movement; they are an important voice for moderation, for reflective consideration of the unintended consequences of what may seem the most benevolent of projects. Reflections like these could give negative immortality's enthusiasts serious grounds for questioning their quest.

Nevertheless, Kass's and Nussbaum's arguments for mortality are scarcely conclusive. They come from within a tradition that does not command the allegiance of all within the multicultural west, much less those outside it. The example of Odysseus and the words of Aristotle and Stevens have much to recommend them, but one cannot prove the goodness of mortality from them. Indeed, the very comparison of the mortal with the immortal leads to paradoxes. Consider this argument from Kass:

To argue that human life would be better without death is, I submit, to argue that human life would be better being something other than human. To be immortal would not be just to continue life as we mortals now know it, only forever. The new immortals, in the decisive sense, would not be like us at all. If this is true, a human choice for bodily immortality would

135. *Id.* at 23.

136. STEVENS, *supra* note 89, at 32.

137. Kass, *supra* note 26, at 23.

138. *Id.* at 24.

suffer from the deep confusion of choosing to have some great good only on the condition of turning into someone else. Moreover, such an immortal someone else, in my view, will be less well off than we mortals are now, thanks indeed to our mortality.¹³⁹

Kass's assertion that the immortal person would be "less well off than we mortals are now" is undercut by his repeated arguments that such a person would have a life totally unlike ours. Either the lives involved are incommensurable or they are comparable. Given that all our horizons of significance are circumscribed by death, the former seems far more likely than the latter. And if that is indeed the case, it seems incoherent to say that the immortal is less well off than the mortal, for they cannot share a horizon of meaning within which such comparisons make sense.

This is not to diminish the significance of Kass's and Nussbaum's work. By appealing to archetypal myths and contemporary aspirations, they raise fundamental questions about the project of negative immortality. They convincingly demonstrate how death gives meaning to life.¹⁴⁰ But they cannot prove the converse—the meaninglessness of deathlessness—because it is impossible to thickly describe immortality.¹⁴¹ If we are suspicious of attempts to achieve it, we should be less concerned with discrediting a situation no one has experienced than with arguing why no one should want to achieve it.

Reflective critics of technology have often questioned whether hailed innovations have improved or impaired our lot. The cellular phone makes life more convenient—but also creates the pressure of making oneself instantly available to work and family members. Technology is only beneficial given a backdrop of shared normative commitments. As we move from inventing artifacts to reinventing ourselves, we risk engendering intimately devastating "revenge effects" that upset delicately balanced patterns of cognition and social interaction.¹⁴²

By drawing analogies from the Midas-like technologies of the self we have already achieved, we might better understand how the attempt to eliminate death might be as disturbing—and ultimately self-

139. *Id.* at 22.

140. *But see* CALLAHAN, *supra* note 5, at 172-73 (relating similar perspectives on death from Irving Singer, Hans Jonas, and George Santayana).

141. For a definition of thick description, see GEERTZ, *supra* note 122, at 12-20.

142. *See* EDWARD TENNER, WHY THINGS BITE BACK: TECHNOLOGY AND THE LAW OF UNINTENDED CONSEQUENCES 6 (1997) ("Wherever we turn, we face the ironic unintended consequences of mechanical, chemical, biological, and medical ingenuity—revenge effects, they might be called. . . . [They are] the tendency of the world around us . . . to twist our cleverness against us.").

defeating—as an attempt to eliminate other negative but necessary dimensions of human experience. Advanced pharmaceuticals might soon offer us a chance to eliminate altogether some of the most negative aspects of human emotional existence, such as depression and anxiety. Should we advance such research? I believe the answer is “no,” and that this response to the technological manipulation of emotional states might ground a similar ethical perspective on technological manipulation of life span.

2. How Death is Like Psychological Pain: Lessons for the Evaluation of Negative Immortality

Although anti-depressants like Prozac have relieved the suffering of millions, the new psychopharmacology has raised ethical concerns. Are those “cured” by the new drugs truly happy or is their good mood merely a chemical substitute for genuine well-being? By improving “mood” overall, the new drugs threaten to dampen not only pathological, “free-floating” feelings of anxiety or sadness, but also *signifying* emotions. A once guilt-ridden man may be freed from irrational anxiety over his sinfulness or self-worth, but he may also cease giving to charity, since he no longer feels guilty when he fails to. Most of us would be glad to deal with his new, easy-going self, but is that relief worth its cost?

Ethical dialogue on this question has so far focused on authenticity—how the new drugs affect users’ integrity, sincerity, lucidity, and commitment. To critics like Carl Elliott (a medical ethicist), using drugs to alleviate alienation may lead to self-betrayal, since intuitions about the worth or worthlessness of forms of life around us are constitutive of our identity.¹⁴³ However, Peter Kramer counters that many drugs don’t dispatch such intuitions, but only relieve the negative affect they generate in those who hold them.¹⁴⁴ In other words, cosmetic psychopharmacology allows a person to preserve his understandings of the world without bearing all the emotional “baggage” that may once have attended them. David DeGrazia further argues that authenticity is enhanced rather than threatened by new technologies for manipulating emotional response, since “part of the human endeavor is deciding and trying to become who we want to be.”¹⁴⁵

143. Carl Elliott, *Pursued by Happiness and Beaten Senseless: Prozac and the American Dream*, 30 HASTINGS CTR. REPORT no. 2, at 7-10 (2000).

144. PETER KRAMER, LISTENING TO PROZAC (1993).

145. David DeGrazia, *Prozac, Enhancement, and Self-Creation*, 30 HASTINGS CTR. REPORT no. 2, at 35 (2000).

While these commentators address an important issue raised by the new psychopharmacology, they miss a more fundamental one. Although the virtues of authenticity are necessary to a life well-lived, they are not sufficient. Authenticity can have any content—one can be authentically rude or polite, generous or stingy. To the extent that it has served as a useful term in contemporary bioethics, authenticity has tacitly incorporated substantive moral ideals. We can only judge new developments in psychopharmacology when we begin to articulate these ideals.

“Articulacy” requires us to look beyond authenticity to the social institutions that create opportunities for good life choices. Do psychopharmacological interventions enable people to relate to their families and friends better? To participate in their communities? Ideally, we aim not merely to maximize our own pleasure, but to lead a balanced life of self-fulfillment and obligation to work, family, friends, and civil society. When psychopharmacology helps us constructively connect to these realms, it is to be applauded. To the extent that it enables us to endure or ignore disconnection, it is suspect.

Projects of negative immortality share the same problem as the unconstrained emotion-creation contemplated by the most ambitious advocates of psychopharmacology. In the name of fulfilling dreams, they threaten to destroy the identity of the dreamer. Like Midas turning his world to gold, the person who chooses constant drug-induced happiness objectifies and cheapens his actual experience. He jettisons the receptivity requisite for an “I-Thou” (as opposed to an “I-It”) perspective on reality.

Similarly, the person who pursues negative immortality (and thereby eschews the projects of positive immortality that give meaning to the lives of those around him) refuses to “play the game” of her peers. She seeks transcendence in a manner that would render their achievements moot. As Midas, Pandora, and Tithonus learned, shortcuts to transcendence can come at great cost. Just as precision manipulation of emotions through drugs would not guarantee “happiness” but only introduce a radically new psychic economy of desire and aversion, negative immortality would transform, and not merely temporally extend, the self. Death, like sadness and anger, is part of an array of socially constructed experiences and expectations that make us what we are. Like the atomist ideologues Charles Taylor critiques, advocates of negative immortality

fail to take account of the degree to which the free individual with his own goals and aspirations . . . is himself only possible within a certain kind of civilization; that it took a long development of certain institutions and practices, of the rule of law, of

rules of equal respect, of habits of common deliberation, of common association, of cultural self development, and so on, to produce the modern individual; and that without these the very sense of oneself as an individual in the modern meaning of the term would atrophy.¹⁴⁶

This may seem to be an exotic or unrealistic concern, for how could you or me or anyone else for that matter cease to think of ourselves as individuals? But Taylor's ultimate concern is not with *us*, but with future generations. As he demonstrates in *Sources of the Self*, the experience of oneself as a distinct, authentic essence, as a chooser of roles instead of an unreflective follower of them, is peculiarly modern. It made little sense in medieval times when one's ascribed identity as a peasant, priest, noble or warrior completely defined one's worldview. And we can imagine this experience fading from history again: not because of the dominance of institutional roles, but because of their etiolation. The institutional background of choice of modern identity—among, for instance, the roles of religious commitment, community organizing, lifelong marital partnership—is presently being overwhelmed by a tyranny of uncoordinated individual choices.¹⁴⁷ If all these cultural, religious, familial, and economic associations fade, there will be no sources of value other than the momentary preferences of the sovereign individual.

Negative immortality makes that fading inevitable: for those who pursue it, the old ideal of attuning to and transcending cultural roles is replaced by a bare commitment to evade death. The sovereign individual who “outlives” all cultural roles will be trapped in the position of “utility maximizer,” bereft of the horizon of choice that made varieties of positive immortality substantive ideals. In Taylor's helpful formulation, he will only be capable of a “weak evaluation” of the desirability of the life options available to him, as opposed to the “strong evaluation” that occurs when we evaluate the legitimacy of our desires.¹⁴⁸

146. CHARLES TAYLOR, *Atomism*, in 1 PHILOSOPHICAL PAPERS, *supra* note 4, at 209.

147. Although institutions may merely be “rule-making entities” according to methodological individualists like Jon Elster, they nevertheless create the rules that structure the roles I here mention. See JON ELSTER, *NUTS AND BOLTS FOR THE SOCIAL SCIENCES* 147 (1989) (defining an institution as a “rule-enforcing mechanism . . . [for] a well-defined group of persons, by means of external, formal sanctions [or rewards]”). All roles consist in a certain set of rules governing what we should believe about our desires, feelings, and beliefs.

148. CHARLES TAYLOR, *What is Human Agency?*, in 1 PHILOSOPHICAL PAPERS, *supra* note 4, at 18.

V. THE OPPORTUNITY COST OF REGENERATIVE THERAPIES

I have so far framed challenges to negative immortality as defenses of the present human lifespan *sub species aeternitate*. A lifespan of about “three score years and ten,” I have suggested, is not a tragic deprivation but a proper baseline, a natural part of life. We can reason to this conclusion by analogy from the self-defeating nature of cognate technologies, as I have tried to do, or from within certain cultural traditions, as Kass and Nussbaum have done.

Yet while such arguments might lead us to reconsider the ultimate goal of negative immortality, they are not terribly convincing with respect to its incremental projects. Conservatives in the nineteenth century might have questioned the development of antibiotics by defending a life span of “three score.” Such judgments are inherently comparative, and few would object to a gradual creeping upward of the average life span.

We appear to be on the horns of a dilemma. Negative immortality may be grotesque, narcissistic, alien—and yet every small step toward it appears wholly legitimate.¹⁴⁹ Regenerative medicine will undoubtedly stave off death for many. Who would deny a man with a failing heart the stem-cell-derived tissues that could repair it? Perhaps this question needs to be supplemented with another:

Can I make an unlimited claim on my fellow citizens to pay, through their taxes and insurance premiums, whatever it takes to keep me alive as long as I (not they) have decided I still have good reason to live? Can I, for that matter, even make an unlimited claim upon my own family?¹⁵⁰

With these queries, medical ethicist Daniel Callahan challenged those who advocate “extraordinary measures” whenever they might extend the life of a sick person. The questions apply with even greater force to the regenerative dream of guaranteeing a perpetually youthful vigor. In the final analysis, projects of negative immortality are objectionable less intrinsically than instrumentally—as lures to a disengaged survivalism.

Consider the practice of cloning. Why go to such extraordinary measures to assure that oneself, or someone whom one has already loved dearly, is replicated genetically? Doesn't the world offer enough other objects of love and concern? This is an obvious argument against cloning, and yet it comes hard to us. Both

149. This is known colloquially as the “boiled frog syndrome.” If a frog is thrown into boiling water, it will jump out, but if it is in a pot and the water is gradually warmed, it will stay in even as the temperature gets dangerously hot.

150. CALLAHAN, *supra* note 5, at 19.

democracy and capitalism teach us to consider such preferences self-justifying. Furthermore, the genetic fetishism so obvious in cloning animates a far more accepted practice: in vitro fertilization. Despite its diversion of medical resources from genuinely sick people and parental love from thousands of children awaiting adoption, in vitro fertilization enjoys widespread support.¹⁵¹ But is the desire of two persons to express their genetic material in a child really all that different from the desire of one to do the same?¹⁵²

Given the number of children awaiting adoption, or simply some form of support from those better off, it is undoubtedly better that the love and concern which the infertile now seek so assiduously to direct toward a future human being with a genetic makeup similar to their own be redirected to those who *presently* need it. Of course, this does not mean that those who cannot naturally have a child should bear the full burden of caring for poor children, either through adoption or other forms of support. To the contrary, it only indicates how important these social duties are for everyone—and how frequently they are neglected. Regardless of how one feels about the treatment of embryos, exotic experiments with human reproductive cloning are a scandalous misallocation of medical resources in a world where “more than 10 million children under 5 die each year from preventable causes such as malnutrition, unsafe water, and the lack of even the most basic health care.”¹⁵³

Admittedly, very few people now demand reproductive cloning; present political controversy surrounds the “therapeutic cloning” necessary to produce replacement tissues in regenerative medical therapies. This is certainly a more noble pursuit than the effort to “resurrect” a loved one by cloning their DNA. Yet it is worthwhile to question it as well—especially in light of the global inequality of medical resources. Nearly all the incremental advances toward negative immortality touted in the media are good for their recipients. But when considered as a deliberate allocation of resources in

151. In May 1994, the Princeton Survey Research Associates reported that 75% of Americans “accepted the use of in vitro fertilization as a treatment for infertility.” See LEE SILVER, REMAKING EDEN: HOW GENETIC ENGINEERING AND CLONING WILL TRANSFORM THE AMERICAN FAMILY 275 (1998) (quoting results of a survey conducted for *Family Circle* magazine).

152. See William Eskridge & Edward Stein, *Queer Clones*, in CLONES AND CLONES 95, 109 (Cass Sunstein & Martha Nussbaum eds., 1998) (answering no, since “[q]ueer cloning can be viewed as the next logical step in queer people’s formation of families of choice”).

153. Peter Singer, *Who Deserves the September 11 Cash Pile?*, SLATE, Dec. 12, 2001 at <http://slate.msn.com/?id=2059690> (citing UNITED NATIONAL DEVELOPMENT PROGRAM, THE STATE OF THE WORLD’S CHILDREN (2001), available at <http://www.unicef.org/media/sowc02/presskit/fullreport.htm>).

a world of scarce medical resources, they take on a different moral valence.¹⁵⁴

Consider a fearful symmetry reported in 1998: As surgeons in France perfected the first human hand transplant, rebels in Sierra Leone terrorized opponents by cutting off their hands.¹⁵⁵ As the First World chalked up yet another technological achievement, another part of the developing world slipped into anarchy. Such juxtapositions indicate the breadth of the divergence of world living standards. Considered on a global scale, the inequalities demand immediate rectification. Thousands of children die each day of preventable diseases, while thousands of dollars are spend each minute to advance technology that can only serve the richest one percent of the planet.¹⁵⁶

Perhaps the new technology might someday be used for the poor as well as the rich. Certainly, as productivity in developed nations grows, we can expect more of our surplus to be charity for less developed countries.¹⁵⁷ Many progressive economists would insist that even the most byzantine medical technologies play some role in fueling a global economy that will eventually benefit all. The hand surgeon may eventually volunteer for *Médecins sans Frontières*—or at least donate to it.

But one can also tell a different story about technology, a story more expressive of the practices of inequality now manifest in the global economy. Worldwide, more than 100 million people live on less than one dollar a day. As their lives, practices, and concerns grow more distant from our own it is easy to imagine the flagging of worldwide movements of sympathy and practical solidarity.

154. Echoing the legal realists, Calabresi and Bobbitt note, “we comfort ourselves in the belief that our society does not establish an acceptable number auto deaths, but that this figure results from thousands of independent, atomistic decisions.” GUIDO CALABRESI & PHILIP BOBBITT, *TRAGIC CHOICES* 20 (1978). The rules governing this tightly regulated realm could easily be changed to drastically increase or decrease the amount of deaths depending on society’s preferences. *Id.* Similarly, minimal reallocation of resources could vastly reduce the number of deaths in less developed countries due to lack of basic medical care. As the United Nations Commission on Macroeconomics and Health has determined, if “rich countries [spent] an extra one-tenth of 1 percent of their economies on the health of the poor . . . [e]ight million lives a year would be saved.” Editorial, *Health Aid for Poor Countries*, N.Y. TIMES, Jan. 3, 2002, at A22. Peter Unger extends this logic from the political to the personal level. See PETER UNGER, *LIVING HIGH AND LETTING DIE* 10-25 (1996).

155. Compare Lawrence K. Altman, *Man Moving Transplanted Hand*, N.Y. TIMES, Nov. 17, 1998, at F6, with Barbara Crossette, *In West Africa, a Grisly Extension of Rebel Terror*, N.Y. TIMES, July 30, 1998, at A1.

156. See UNGER, *supra* note 154, at 7.

157. See David Dollar & Aart Kraay, *Spreading the Wealth*, FOREIGN AFF., Jan./Feb. 2002, available at <http://www.foreignaffairs.org/articles/Dollar0102.html> (arguing that “the current wave of globalization, which started around 1980, has actually promoted economic equality and reduced poverty”).

Some advocates of negative immortality have made the connection between the theories of distributive justice implicit in present medical practices and the prospect of speciation on the basis of qualitatively different terms of life. Unfortunately, their efforts to rationalize present practices encourage their amplification in the future. Consider the following editorial perspective on the future of regenerative therapy:

We would face the prospect of parallel populations, of “mortals” and of “immortals” existing alongside one another. While this seems inherently undesirable, it is not clear that we could, or even that we should, do anything about it for reasons of justice. For if immortality is a good, it is doubtful ethics to deny palpable goods to some people because we cannot provide them for all. . . . We don’t usually regard ourselves as wicked in Europe because we perform many [organ] transplants while low-income countries perform few or none at all.¹⁵⁸

The reasoning here is as facile as it is disengaged. Obviously, no particular transplant is “wicked,” but a supine indifference to the inequality that makes them unavailable in less developed countries almost certainly is. We in the First World cannot fault ourselves for taking advantage of medical technology now available to us—but only on the condition that we conscientiously try to extend it to less developed countries. The inequality casually countenanced in this passage is morally unacceptable. What levels of inequality in medical care are acceptable? I can only offer a few guidelines here but enough, and hopefully uncontroversial enough, to spur reconsideration of the present allocation of funds to new frontiers of medical research. I draw inspiration from the example of Albert Schweitzer.

When he was twenty-nine, Schweitzer was about to engage in a promising career as a theologian and preacher. He had committed himself to what, he then thought, were the highest things: a life of contemplation and moral teaching. But he was also troubled by his decision. He reflected in his autobiography that, “[w]hile at the University and enjoying the happiness of being able to study and even to produce some results in science and art, I could not help thinking continually of others who were denied that happiness by their material circumstances or their health.”¹⁵⁹ He resolved that he “must

158. John Harris, *Intimations of Immortality*, SCIENCE, Apr. 2000, at 63. Harris concludes that “it is unlikely that we can stop the progression to increased life-spans and even ‘immortality,’ and it is doubtful that we can produce coherent ethical objections. We should start thinking now about how we can live decently and creatively with the prospect of such lives.” *Id.* at 64.

159. Albert Schweitzer, *Out of My Life and Thought*, in PILGRIM SOULS: A COLLECTION

not accept this happiness as a matter of course, but must give something in return for it.”¹⁶⁰ He thereafter committed himself to medical service in Equatorial Africa.

Schweitzer is an exemplar, a paragon of self-sacrifice. As Susan Wolf argues, it is unwise to make “moral saints” the measure of our ethical aspirations.¹⁶¹ But his example still exerts moral pull—as an ideal we might reflect imperfectly in our own lives. For who among us can simply ignore the plight of the poorest? Are we not called upon to temper our enjoyment of this world’s plenty with some awareness of the Third World’s scarcity? Isn’t sharing more, more than a supererogatory duty?¹⁶²

Anyone who answers “yes” to these questions should be wary of supporting further research into technologies of life-extension in the first world unless and until the bounty of its accomplished achievements is far more widely available in lesser developed countries. Since the new technologies of regenerative medicine threaten to undermine our common sense of humanity, principled research should be premised on a principled scheme of medical distribution. Advocates of the new medicine admit that it would be available to a “small minority of the population even in technologically advanced countries.”¹⁶³ Even if wealthy countries committed to the universal availability of regenerative therapies within their borders—a heroic assumption—such progressivism would only exacerbate the divide between their populations and those of lesser developed countries. Given the distributional implications of aggressive pursuit of negative immortality, comparatively wealthy societies should match whatever resources they invest in the new technologies of life-extension with donations to charities that aim to give the poorest persons a minimally decent life.

Individuals, too, are obliged to rethink the ways they invest (directly and indirectly) in the projects of negative immortality.¹⁶⁴

OF SPIRITUAL AUTOBIOGRAPHIES 385 (Amy Mandelker & Elizabeth Powers eds., 2000).

160. *Id.*

161. See Susan Wolf, *Moral Saints*, 79 J. PHIL. 424 (1982); see also Marsha Aileen Hewitt, *Contested Positions: Modernity, Postmodernity, and the Feminist Critique of Saintly Ethics*, 2 MARBURG J. RELIG. 1 (1997), at <http://www.uni-marburg.de/religionswissenschaft/journal/mjr/hewitt.html>.

162. I apologize if the first-person form of address here is unduly hortatory. I mean only to highlight that formal moral reasoning is addressed to a community of readers privileged enough to access the texts in which its arguments appear. Although conventions often require us to mask that fact with objective language, even the most respected contemporary philosophers acknowledge that they build their work upon the “considered convictions” of their readers. See JOHN RAWLS, *A THEORY OF JUSTICE* 40-47 (rev. ed., 1999).

163. Harris, *supra* note 158, at 81.

164. “Of course if the state does not promote general well-being, a moral principle of beneficence will require (better-off) people to do so.” Liam Murphy, *Beneficence, Law, and*

One strategy would be to match whatever one spends on extraordinary medical technologies with donations to assure that poorer people get access to ordinary medical technologies.¹⁶⁵ Since the distinction between the ordinary and the extraordinary is difficult to apply in practice, a more reliable heuristic would be comparative evaluation of insurance payments. In other words, a person genuinely concerned about the potential of new technologies to advance inequality of life chances would try to match whatever they spent above the average on health insurance with donations to insure those without coverage.¹⁶⁶

One might object: why scrutinize health care expenditures so carefully? Even if we follow liberal theorists and accept a public duty to assure that all persons meet a certain baseline of care, why should our contribution to this goal be tied to our own health expenditures?¹⁶⁷ Shouldn't people match, say, what they spend on entertainment, with expenditures for the poor?

These difficult questions challenge the heuristics proposed above. Nevertheless, health care is an area in which we need to be concerned, not only with assuring everyone a certain baseline of care, but also with assuring that levels of care in general do not diverge too far from a norm. As "boutique" medical practices become more common, already existing medical resources are being allocated away from those who cannot afford them in order to

Liberty: The Case of Required Rescue, 89 GEO. L.J. 605, 653 (2001) (defending the traditional philosophical position that "the very same fundamental normative principles [govern] both institutional design and personal conduct"). Those who profess to care about distributive justice cannot just go to the polls, vote for the candidate they believe most likely to promote it, and then blissfully enjoy whatever surplus accrues to them when the other candidate is victorious. See generally G.A. COHEN, IF YOU'RE AN EGALITARIAN, WHY ARE YOU SO RICH? (2000). I examine the implications of Cohen's position elsewhere. See Frank Pasquale, *The Cost of Conscience: Quantifying Our Charitable Burden in an Era of Globalization* (unpublished manuscript, on file with author).

165. Traditionally, moral and political philosophers believed that the very same fundamental normative principles governed both institutional design and personal conduct.

166. Admittedly, if the reference group for such comparative evaluation were humanity at large, "[f]or even moderately well-off people, compliance with this [principle] would make for a radical change of lifestyle." Murphy, *supra* note 164, at 644. However, a principle should not be rejected simply because our present inability to adopt it generates cognitive dissonance. The comparisons and guidelines suggested here are regulative ideals, meant to temper enthusiastic investment in further biotechnological innovation with sober awareness of how few people enjoy what has already been achieved.

167. Here I mainly refer to the theories of Ackerman, Dworkin, and Rawls. See BRUCE A. ACKERMAN, *SOCIAL JUSTICE IN THE LIBERAL STATE* 267-69 (1980); Ronald Dworkin, *Justice in the Distribution of Health Care*, 38 MCGILL L.J. 883 (1993); JOHN RAWLS, *A THEORY OF JUSTICE* 152-53 (1971). For a sensitive treatment of the first two theories with many implications for the discussion here, see Mark S. Stein, *Ronald Dworkin on Redistribution to the Disabled*, 51 SYR. L. REV. 987 (2001); and Mark S. Stein, *Rawls on Redistribution to the Disabled*, 6 GEO. MASON L. REV. 997 (1998) (discussing the proper treatment of "least advantaged class" in deontological and utilitarian theories of distributive justice).

provide “deluxe” care for the wealthy.¹⁶⁸ Regenerative medicine threatens to further inure the comparatively wealthy to the claims of the poorest by rendering their lives qualitatively different. Most other expenditures (such as those on entertainment) are methods of dealing with (or distracting oneself from) a common human fate of mortality. The new technologies of negative immortality are methods of escaping this fate, and thus may erode the bonds of empathy upon which the moral psychology of distributive justice is premised.¹⁶⁹

Thus new technologies of self-enhancement merit even greater skepticism. Raymond Kurzweil, inventor and author of *The Age of Spiritual Machines*, predicts that by 2030, “we will have fully nonbiological brains that are copies of human brains but vastly extended.”¹⁷⁰ Kurzweil’s prediction glosses over a difficult problem: who are the “we” who will possess (or be possessed by) these brains? Given that forty percent of the world’s population doesn’t have access to reliable plumbing, can he possibly believe that in the next thirty years nearly everyone will have access to these computer brains? Will or could even all the readers of *Time* magazine (his presumed audience)?¹⁷¹ Realistically speaking, there will probably be as unequal a distribution of this future “hardware” as there is of the present stuff.¹⁷² The resulting divergence between those with and without “nonbiological brains” would make today’s digital divide look like a crack in the sidewalk—a fact other futurists readily admit.¹⁷³

168. See Pam Belluck, *Doctors’ New Practices Offer Deluxe Service for Deluxe Fee*, N.Y. TIMES, Jan. 15, 2002, at A1 (describing how groups of doctors are transitioning to “concierge or boutique practices” by cutting the number of patients they see and giving extra attention to patients who pay annually from \$1,500 to \$20,000 above medical costs covered by insurance).

169. See NUSSBAUM, *supra* note 129, at 340; see also George J. Annas, *The Man on the Moon, Immortality, and Other Millennial Myths: The Prospects and Perils of Human Genetic Engineering*, 49 EMORY L.J. 753 (2000) (arguing that some proposed genetic engineering should be censured as a “crime against humanity” because of their potential for promoting speciation).

170. Raymond Kurzweil, *Will My PC Be Smarter Than Me?*, TIME, June 19, 2000, at 44.

171. As Stephen Hall reports, “Access to the regenerative medicine of stem-cell and immortalizing enzymes is most likely to be a phenomenon available only to affluent segments of the population in the developed world.” Hall, *supra* note 46, at 81.

172. Other writers have capably anticipated such a divided society. See, e.g., HUXLEY, *supra* note 3; Bill Joy, *Why the Future Doesn’t Need Us*, WIRED, Apr. 2000, available at <http://www.wired.com/wired/archive/8.04/joy.html>. They suggest that Kurzweil’s future, and partial, “we” is likely to command power that dwarfs that enjoyed by today’s leaders. These authors predict that human beings left unenhanced by projects of negative immortality would become like “savages,” viewed by the elite with the pity or condescension colonists reserve for the colonized.

173. Princeton biologist Lee Silver predicts that genetic engineering will eventually divide American society into two classes: “The people of one class [will be] referred to as Naturals, while those in the second class [will be] Gene-enriched or GenRich. . . . [They will] grow up and live in segregated social worlds where there is little chance for contact between them.” SILVER, *supra* note 151, at 4, 7. For a less fanciful vision of class divergence due to “assortative mating,” see MICKEY KAUS, *THE END OF EQUALITY* 31, 45, 180 (1992).

Admittedly, Kurzweil's aims are far removed from the practical aims of most medical researchers. Their advocates can relate thousands of stories detailing the promise of regenerative medicine for the sick. In an account of the political controversy over stem cells, *New York Times* reporter Jane Brody mentions the fate of her father, who suffered a heart attack that permanently weakened him: "He survived, but could not pick up his grandchildren, carry a suitcase or do the gardening he loved. Had there been stem cells that could have regenerated his damaged heart muscle . . . his remaining years would certainly have been better."¹⁷⁴ As a practical response to the problems of the aged and sick, regenerative medicine expresses a deeply compassionate human desire to end suffering.

But we need to remember that this is, for the foreseeable future, a narrowly directed compassion. A daughter may justifiably feel that her suffering father is due every conceivable medical intervention. But can any moral observer support the inequality of resources that permits him to command tens or hundreds of thousands of dollars of medical attention, while denying millions of other persons the chance even to see a doctor? The two perspectives must be reconciled. For most residents of the developed world, marginal allocations of resources from oneself and one's family, to those who need them most (perhaps via tithing), is a step toward reconciliation.

As medical care advances, it becomes harder and harder to imagine a "natural" death. Regenerative medicine promises a bottomless toolkit of extraordinary measures capable of reversing the effects of time, disease, and accident. We rightly consider many of these advances great goods, but they also burden us with extraordinary responsibilities. "[B]y look[ing] upon death as a correctable biological deficiency, [and] conflating human action and the independent actions of nature," modern medicine has "imput[ed] to human beings an all-encompassing responsibility for death."¹⁷⁵ It is hard to face the fact that a decision not to buy, say, the very best insurance and medical care, might result in a shorter life.

But before sinking ever more resources into the pursuit of a few more years of life, it is important to consider the alternatives forsaken by doing so.¹⁷⁶ We need some way of balancing duties to self,

174. Brody, *supra* note 34, at F8.

175. CALLAHAN, *supra* note 5, at 58. Callahan observes that modern medicine has come, "in its working research, and often clinical agenda, to look upon death as a correctable biological deficiency." *Id.*

176. Health care expenditures have outpaced inflation for over a decade. See CENTERS FOR MEDICARE & MEDICAID SERVICES, REPORT DETAILS NATIONAL HEALTH CARE SPENDING INCREASES IN 2000, available at http://cms.hhs.gov/media/press/press_release.asp?Counter=328 (disclosing that "[h]ealth care spending in the United States rose to \$1.3 trillion in 2000, a 6.9 percent increase over the previous year").

family, and world. A conscientious effort to extend extant medicine to all is the first step toward legitimizing investment in technologies that now, and for the foreseeable future, will be exclusively enjoyed in the world's most developed countries.

VI. CONCLUSION

The task and potential greatness of mortals lie in their ability to produce things—works and deeds and words—which would deserve to be and, at least to a degree, are at home in everlastingness.

—Hannah Arendt, *The Human Condition*¹⁷⁷

Our age demands a principled response to technological advance. Instead, the media confronts us with a dizzying array of perspectives. Stem-cell research is censured one day and praised the next. Some declare genetically engineered crops and animals to be a crime against nature; others believe they will end world hunger. Unquestioned good threatens to drag in its wake incalculable harm.

Most Americans approach these developments with a curious mixture of optimism and fatalism. We hope consumer demand will somehow domesticate ominous research agendas. Faith in the invisible hand feeds on a tacit conviction that “progress” is inevitable and unchannelable.

Those who challenge quiescence are usually written off as Cassandra and not without reason. Even reflective critics of technological advance offer little more than vivid pessimism to confront the blind optimism of popular culture. Although their worry about specific innovations is wise, it does not amount to a principled response to technological advance. A *constructive* anxiety depends on a coherent vision of a common future. In other words, we need to determine not only what technology *shouldn't* do, but also what it *should* do.

Unfortunately, both religious and secular critics of regenerative medicine have so far concentrated on the former far more than the latter. Church leaders have focused nearly all their criticism on the destruction of embryos—leaving them little basis for critically evaluating technologies that “save” embryos by manipulating other human biological materials in even more disturbing ways. Secular critics have shifted the debate from the methods to the possible consequences of regenerative medicine, evoking a *Brave New World* of genetically engineered speciation. But even if regenerative medi-

177. HANNAH ARENDT, *THE HUMAN CONDITION* 19 (1958).

cine were certain to lead to a dystopic future, its principled proponents could still argue that its present benefits are too great to ignore.

However, they cannot ignore the medical projects we presently forego by investing in regenerative care. While a *Brave New World* is a long way off (if it is coming at all), our world presents its own nightmares of inequality and qualitatively different life chances. They may not be socially engineered, but they threaten to be reinforced by the prospective distribution of regenerative therapies. We only pursue them at risk of undermining our already fragile sense of a common humanity.

Like any great human project, medicine expresses the best and worst, the *grandeur* and *misère*, of human nature.¹⁷⁸ In coming years we will face ever deeper demands from the new medicine ranging from federal funding for research to permission for new human-subject experiments. As potential methods for relieving suffering, all the proposed innovations deserve a hearing. However, we cannot allow the humanistic project of healing the sick to metamorphose into an elite quest for invulnerability. Further research into regenerative therapies should be conditioned on the wider availability of medicine that we take for granted—and that much of the world now finds hopelessly out of reach.

178. "The more light we have, the more greatness and the more baseness we discover in men." PASCAL, PENSEES 251 (W.F. Trotter trans., Univ. of Chicago Press 1952) (1660) (number 443).

