Finessing Nature

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Introduction

Even those who favor the prospect of human cloning have become troubled, largely because, they believe, so many of us in this complex society are simply too *laissez faire*, too jaded to appreciate the altogether serious implications of scientific endeavors. We sometimes seek too avidly advances in biomedical science that are meant to benefit us and are rich with promise for our future children and for humanity—but these advances also can risk the very things we cherish most. This applies especially to the prospect of human cloning. Declared over four decades ago, the sentiment expressed by Nobel Laureate geneticist Joshua Lederberg in 1966 is captivating still: "cloning could help us overcome the unpredictable variety that still rules human reproduction, and allow us to benefit from perpetuating superior genetic endowments."

That theme was later adopted by other Nobel Laureates in genetics—Sir John Eccles, Sir Macfarlane Burnett, and more recently by Walter Gilbert and James Watson. Scientists seem a united front. Their vision embodies the notion that it is best that "nature" *not* be left to its own devices, as it is essentially blind and unpredictable. Therefore, nature must be, as I prefer to say, finessed. Human beings must actively support scientific efforts to take matters into their hands through planned interventions. Those who oppose genetic manipulation and cloning are not only wrongly suspicious of science, proponents argue, but also irrationalism and numeric illiteracy also often account for their suspicion.

This orientation toward human life and reproduction outrages those most opposed to cloning and manipulation of the human genome. Expressed energetically some decades ago by biomedical ethicists June Goodfield and Paul Ramsey, most recently this view has seen vigorous expression by Leon Kass, chair of President George W. Bush's Council on Bioethics. (The Council was established on October 3, 2001, following the expiration of the charter of the National Bioethics Advisory Commission, NBAC, which itself was created by Presidential Executive Order in 1995, during the Clinton administration.) Kass had long been a critic of the NBAC, worrying that it would yield "to the wishes of the scientists to clone human embryos," and would call for only a temporary moratorium on "implanting cloned embryos to make a child." The NBAC did indeed recommend only a temporary ban. Kass and other scientists, who are deeply suspicious of genetic manipulation generally, and of cloning especially, embrace the belief that the so-called "natural" way is indeed the preferable way, because it is ultimately ordained by God. (Further complicating matters is that, while opponents of cloning hold views that typically rely on some understanding of religion, they rarely seem to find a place for religious language in their defense of cloning, stem cell research, and genetic engineering.)

The purpose of this article is to suggest that we need to consider carefully the ethical implications of substituting technology and genetically innovative means to assist human reproduction—that is, of "finessing" nature. To do this, one must first understand some of the ethical debates surrounding the most contentious form of assisted reproduction that lies in the future—that of human cloning. After examining the arguments against cloning, I present thoughtful reconsiderations of those arguments (some of reconsiderations actually support the prospect of human cloning). Finally, I discuss the work of two Canadians researchers, who suggest that environmental conditions might actually accelerate the use of reproductive technologies. I conclude by proposing the outlines of the ethical stance we must take in order to approach with care the prospect of finessing nature.

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Arguments against Cloning

1. Cloning is repugnant. Kass's appointment as chair of the President's Council on Bioethics suggests that a new day has dawned for the opponents of cloning and related research. The trouble with human cloning is that it is fundamentally "dehumanizing" and everyone ought to find it repugnant. At the crux of his argument, oddly, is the simple and undefended assertion that cloning should evoke a common feeling—"repugnance"—that points to a "deep wisdom, beyond reason's power fully to articulate." Even Ian Wilmut apparently agrees: during his initial announcement of Dolly, the first cloned mammal, he declared that using his technique to produce human beings would be "quite inhuman."

2. The "natural" way is the "profound" way. Kass also argues that human beings are sexual in a special sense: reproduction in its "natural" form brings about "some very special and related and complementary" relationships to others. The power of sexuality, he finds, "is, at bottom, rooted in its strange connection to mortality, which it simultaneously accepts and tries to overcome." In contrast, human cloning is essentially asexual reproduction; the organism that is divided to become two is itself preserved (doubly), and nothing dies. Sexuality, however, "means perishability and serves replacement; the two that come together to generate one soon will die. . . . Whether we know it or not, when we are sexually active we are voting with our genitalia for our own demise. . . . " Therefore, he continues, "sex is bound up with death, to which it holds a partial answer in procreation."

This understanding of human sexuality allows Kass to set forward his main objections to cloning. He believes that cloning creates serious issues of identity and individuality. Not only will the clone be genetically identical to another human being, but the clone also might be twin to the person who is his "father" or "mother," adding "psychic burdens" to being the child or parent of one's own twin. The clone will also "be saddled with a genotype [genetic constitution] that has already been lived. He will not fully be "a surprise to the world," but will instead be used goods. Kass also argues that cloning is a giant step toward making procreation manufacture—"a process already begun with *in vitro* fertilization and genetic testing of embryos." Cloning will allow "human artisans" to select "the total genetic blueprint of the cloned individual." In this kind of reproduction, the maker is not equal but superior to the one made, who is a product designed to "serve rational human purposes." Cloning, finally, Kass insists, confuses and disrupts the human relationship, introducing a "profound and mischievous misunderstanding of the meaning of having children and of the parent-child relationship." Natural procreation *means* that by their act the partners affirm the creating of a new life, blending themselves into a baby with its "own and never-before-enacted life to live."

3. The "bright line": here and no further. Concerned that the NBAC did not represent "the voices of grassroots Americans," a group calling itself The American Life League, Inc. established in 1997 the American Bioethics Advisory Commission (ABAC), which subsequently issued its own report. The ABAC stressed that there exists a "bright line dividing legitimate and exciting scientific research and development from dangerous and dehumanizing manipulation." The only way to "embrace what is good and reject what is evil," is to respect this line by encouraging "responsible experiments in animal cloning," but imposing a global ban on human cloning. The mention of "good" and "evil" were meant to raise religious concerns that, according to ABAC, were absent in debates of this kind.

4. You just can't trust 'em. In fact, the ABAC also contended that the rare mention of "religion" is often accompanied by embarrassment. The NBAC apparently agreed with this point and, enlisting the assistance of several groups, authorized a study of the religious issues and themes raised by human cloning. One group, the Program for Ethics, Science, and the Environment (housed at Oregon State University's Philosophy Department) sought the view of persons of faith from a wide variety of traditions. Worries about the prospect of human cloning varied, with, for instance, one clergyman speculating that "cloning would violate practically every sacramental dimension of marriage, family life, physical and spiritual nurture, and the integrity and dignity of the human person." But another clergyman suggested that cloning should be permitted to continue, but "the impetus and ethical motivations behind human cloning [must] be meticulously monitored," its practices "tightly regulated," cloning of human cells must never be permitted to reflect "racial or ethnic, or other demographic subgroup (i.e., gender)" and, finally, access to any benefit must be universal.

The range of recommendations by religious thinkers reveals that technology is not itself disturbing; rather, these thinkers seem to worry that scientists and physicians, in whose hands genetic manipulation is entrusted, are more likely to break than to keep that trust.

5. The reach of myth. Wendy Doniger, a distinguished history of religions scholar at the University of Chicago, suggests that the notions of threat and promise that accompany the prospect of cloning human beings are deeply embedded in Western history and mythology. Although the actual prospect of cloning a human being is quite recent, Doniger points out that something very much like it has fired the human imagination for millennia and finds expression in a variety of myths. She is particularly interested in

the historically embedded notion that "doubles could be produced by the ancient counterpart of science—magic."

According to her research, a main reason to oppose the making of "doubles"—combined with fear and fascination, not unlike today—had to do with attitudes about sexual conduct: "time and again one clone somehow or other stumbles in the other's bed, and this feel of advertent or inadvertent sexual betrayal" is "an inescapable part of the terror of cloning." Mythic sources suggest that clones—or "doubles," "duplicates," "multiples," erase the individuality of the one doubled and thus threaten personal identity. Another main mythological theme concerns eugenics, the search for ways to use biological means to "improve" future humans. The sexual side predominates here as well, since the principal theme is that of males who want to ensure that their offspring look like them—guaranteeing their paternity as well as the presumed quality of their offspring. At the heart of these myths is an elemental resistance to the possibility "that a clone—that is, a magically created double—could have a separate soul, that in creating a body *de novo*, the magician could create a soul *de novo* too."

Responses to the Objections

Although much has been made of the presumed repugnance at the prospect of human cloning, the subversion of the natural, and the inappropriate power of its practitioners, challenges to the arguments against cloning are put forward just as vigorously.

1. Questioning the "identical" nature of clones. The well-known Harvard University scientist Stephen Jay Gould has noted with palpable irony how fashion often governs not just public mood but even scientific projects. Much of the knowledge and technical skill needed to clone humans has been around for some time now, and Wilmut's Dolly was not in fact the first mammalian clone—it was merely the first engineered from an adult cell. Gould asks the obvious question: what's the big deal anyway? To which his answer is blunt and immediate: no big deal at all, *if and when* you think about it.

The trouble is, not many have thought about cloning. Not only had Wilmut and his colleagues also cloned sheep from the cells of a nine-day embryo and a twenty-six-day fetus (with much greater success, incidentally), but far and away the most significant of the seemingly endless outpouring of questions about human cloning have already been answered, in good old empirical fashion: "We have known human clones from the dawn of our consciousness. We call them identical twins—and they are far better clones than Dolly and her mother." Gould thus wonders, "Why have we overlooked this central principle in our fears about Dolly? Identical twins provide sturdy proof that inevitable differences of nurture guarantee the individuality and personhood of each human clone."

The preeminent twin researcher, Nancy L. Segal, emphasizes just this point, insisting that *"identical twins are clones, but clones are not identical twins."* Cloned human beings are not identical in the strict sense "because they fail to fulfill the three twinship criteria: simultaneous conception, shared prenatal environments and common birth." Moreover, cloned individuals differ in other significant ways, because environmental factors will vary; thus, she stresses, however one feels about the perennial dispute, "the *nurture* part of the nature versus nurture equation will be *completely* different." Finally, as many researchers and medical ethicists have noted, not even identical twins are, strictly, *identical:* differences in fingerprints, organic brain structures, intelligence, personalities, and the like are the rule, not the exception. Thus, even if clones were more like naturally occurring identical twins than they in fact are, one would still find significant differences, the sum of which demonstrate the complete falsity of the notion that a clone is an exact copy of a person.

2. Reconsidering the "Yuk factor." Evolutionary biologist Richard Dawkins clearly agrees with the considerations of Gould and others, to which he adds that he finds nothing wrong with human cloning. To those, like Kass, who appeal to "repugnance," Dawkins insists that this "'yuk reaction' to everything 'unnatural'" should make the rest of us stop and think about such a "reflex and unthinking antipathy." In fact, anyone disturbed by scientific interventions into the "natural" order of things should consider the fact that, for instance, it is just as *unnatural* to read books, drive an automobile, cut up carrots, or wear clothing, as it would be to clone babies. Correlatively, it is just as *natural* to clone an infant in order to acquire more healthy cells as it is to use antibiotics to help heal wounds.

Those who rely on the ambiguous distinction between "natural" and "unnatural" in their opposition to human cloning must accept the onus of showing that it is "any more momentous than the introduction of antibiotics, vaccination, or efficient agriculture. . . ."

As Gould and Dawkins make clear, those who rely on the ambiguous distinction between "natural" and "unnatural" in their opposition to human cloning must accept the onus of showing that it is "any more momentous than the introduction of antibiotics, vaccination, or efficient agriculture, or than the abolition of slavery."

3. We are not in our genes. George Johnson, a science correspondent for the *New York Times*, nicely summarizes several key points in the dispute, observing that "the queasiness many people feel over the news that a scientist in Scotland has made a carbon copy of a sheep comes down to this: If a cell can be taken from a human being and used to create a genetically identical double, then any of us could lose our uniqueness. One would no longer be a self." The anxious sense that human cloning poses challenges to personal identity has deep mythic and biological roots; but here too, when one thinks about it, there is little to fear. Johnson's rendition of the point is worth citing at length:

> That each creature from microbe to man is unique in all the world is amazing when you consider that every life-form is assembled from the same identical building blocks. Every electron in the universe is indistinguishable . . . all protons and all neutrons are also precisely the same. . . .
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> Every carbon atom and every hydrogen atom is identical. When atoms are strung together into complex wholes—the enzymes and other proteins—this uniformity begins to break down. Minor variations occur. But it is only at the next step up the ladder that something strange and wonderful happens. There are so many ways molecules can be combined into the complex little machines called cells that no two of them can be exactly alike.
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> Even cloned cells, with identical sets of genes, vary somewhat in shape or coloration. . . . But when cells are combined to form organisms, the differences become overwhelming. A threshold is crossed and individuality is born.
>
> Two genetically identical twins inside a womb will unfold in slightly different ways. The shape of the kidneys or the curve of the skull won't be quite the same. The differences are small enough that an organ from one twin can probably be transplanted into the other. But with the organs called brains the differences become profound.

Although one can argue with the conclusion Johnson draws: "While it is possible to clone a body, it is impossible to clone a brain," he is correct that from the earliest beginnings to the most sophisticated forms of human life, our human genes have the capability of indicating only the *rough outlines* of neural wiring. Random mutation and environment influence neural connections and all aspects of the organism.

4. "Success" in perspective. In a published adaptation of a lecture on cloning delivered at a joint meeting of the medical societies of San Bernardino and Riverside Counties (California), Mark D. Eibert makes a case for encouraging human cloning. Eibert points out that in the case of Dolly, Ian Wilmut began with 277 reconstructed eggs (eggs that had their nuclei removed and were then fused with an adult cell). These eggs were then cultured in sheep oviducts; of the original 277 reconstructed eggs, only 29 successfully divided and became embryos. These 29 were transferred to the uteruses of 13 sheep (some received one, others two or three eggs), but only one sheep became pregnant—from which Dolly was born.

Eibert emphasizes that, comparing this figure—one success from thirteen attempts—to the ratio of live births resulting from *in vitro* fertilization (IVF), it was not until 1990—twelve years after the birth of the first IVF baby in England—that the average success rate for IVF "got to be as good as one out of 13." (Currently, the IVF success rate worldwide is about 25 percent, a rate that took twenty years of highly focused efforts.)

But Dolly was only the first cloning experiment of its kind. In the second—cloning of fifty mice in Hawaii—the efficiency rate was even better (again, comparing the number of eggs per live birth): ten times higher than Wilmut's experiment. The third published adult cell cloning experiment, Eibert points out—this occasion, the cloning of cows in Japan—was seventeen times more efficient than Wilmut's results. Moreover, a variety of other species have already been cloned using Wilmut's technique—goats, pigs, rhesus monkeys—"literally hundreds of animals in the world who were conceived through adult cell cloning." Because none of these efforts have been nearly as risky as the detractors constantly allege, Eibert concludes that the argument against cloning based on safety concerns is getting weaker almost daily.

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Indeed, for those people unable to have children (between 10 to 15 percent of the population) and for whom IVF or alternative means have failed, cloning might be the only chance to have children. Eibert notes that arguments used more than twenty years ago in the effort to stop IVF are now being used again, this time against human cloning. Before the birth of Louise Brown, the first baby born from IVF, the large majority of Americans polled (85 percent) were opposed to IVF—until successes began to receive public notice, parents of IVF children became more widely known and more commonly encountered, and "safety" a demonstrably irrelevant issue. Precisely the same, Eibert believes, will inevitably occur when human cloning is finally with us, as it most assuredly will be. Human cloning, just as IVF, will become an accepted way of finessing nature's shortcomings.

New Considerations

A quite different and fascinating case raises important questions about human cloning and other tech-

niques that scientists and physicians use to finesse the natural processes involved in human reproduction. Two Canadian sociologists—Louise Vandelac and her research assistant Marie-Héléne Bacon of the University of Quebec at Montréal—argue that "paradoxically" the significant worldwide increase of environmental pollutants, which have been shown to disrupt the human endocrine system, "may accelerate the use of reproductive technologies . . . and even cloning, as well as the dissemination of genetically modified organisms."

Breast cancer, endometriosis, the decline in animal and human sperm density and potency over the past fifty years, as well as a number of maladies have been directly associated with the sharp increase in pesticide use and environmental organochlorine chemicals such as polychlorinated biphenyls (PCBs) and hexachlorobenzene (HCB). Vandelac and Bacon argue that there arise serious, long-term *ethical* consequences of the choices now faced by all nations, individually and collectively. On the one hand, "we could adopt the principles of caution, solidarity and concern for public health," which lead to fewer industrial pollutants, more environmental sensitivity, as well as world-wide education and sound policies that can prevent future damage—a direction they recognize is unlikely to be followed, given the values of a world market economy. On the other hand is the current course of action, in which existing rates and kinds of environmental degradation are permitted to continue and even increase, elevating, in Vandelac and Bacon's words, "the technologization of conception and the 'geneticization' of the living." Since the first option is unlikely to see adoption, continuing the current trend could yield, they speculate, to:

> . . . the growth and widespread institution of a merchant or institutional economy of artificial reproduction, which would gradually replace natural conception for wealthy populations in the Northern hemisphere . . . . We may also witness the proliferation of research on embryos, soon to be cloned, patented, genetically altered, or even used as a vector of cellular lines, thus giving the term 'producer' a whole new meaning. This could also lead to . . . the alteration of the concept we have of human beings and humanity itself, an alteration which has already begun due to the technologization of conception, will be further amplified, giving an unprecedented depth to the mutation of human species.

The expected decline in traditional reproductive ability, . . . might lead us to finesse nature, substituting technologically and genetically innovative means to reproduce.

This kind of future would not necessarily result from the rise in endocrine disruptors alone, but this increase in genetic manipulation and resultant compromise to human reproductivity "could be simply used as an easy justification" for "technologization" and "geneticization," with human cloning waiting in the wings for the call to move to center stage. This process is similar to *in vitro* fertilization, which made its way into the center of the reproduction industry. The expected decline in traditional reproductive ability, Vandelac and Bacon contend, might lead us to finesse nature, substituting technologically and genetically innovative means to reproduce.

Their conclusion is interesting: "if" the market is allowed to move ever further into human reproduction; "if" the boundaries between and among species continue to be eroded by innovations in gene splicing; and "if" by widespread indifference and apathy humanity is allowed redefinition and manipulation, then, they speculate, we shall have been witness to, and even participants by default in, our own degradation if not demise—one as definitive and final as the disappearance of the dinosaurs. While this is a lot of freight to pile on such an 'iffy' platform, their point is intriguing and merits careful deliberation, for it lays out with clarity an entire series of hard choices we must face squarely and at some point decide.

Toward a Conclusion

To consider these matters clearly, we must conceive of, in the words of Vandelac and Bacon, "a global ethics of the living," embracing environmental concerns as requisite counterpoint to uncontrolled growth of technoscience. We must also make certain to "impose a new ethics of politics," and, finally, ethics must be conceived as perhaps humanity's sole remaining way to counteract the market pressures to "redesign the human . . . ," working toward "a new ethics of economy."

One need not wholly agree with their analysis and plea, but it seems to me that only if ethics is reconceived along these lines is there even the slightest change that it can gain a seat at the corporate conference tables and the halls of government. Only such a reconceived ethics can take an effective part in the much-needed broad and democratic ethical debate that can alone assess, Vandelac and Bacon argue, "this future that some want to impose on others." As the eminent ethicist Hans Jonas once remarked, poignantly if also with some sense of lament, we need wisdom most when we hardly believe any longer in its very possibility—yet need it we do, and if we fail to rise to the monumental task of a new ethics capable of addressing itself directly to "exorbitant power," we fail ultimately in the most solemn way our very humanity.

I close with the razor-sharp words of a poet:

How then shall we make love?
The alligators, with their tiny testicles, mourn in the evergladed swamps
And frogs hop on several of their many legs in Minnesota,
While women on Staten Island hug their barren chests and yearn for breasts

What? We did this to ourselves?
Diminished the very thing that kept us fertile?
Laughed at the gods that gave us better living through chemistry, and
Then tried to sell us the cure for their product-aided ailments.

If there be butterflies still, then there be life . . .
If there be moths, and bees and birds, then there be life . . .
Somewhere, in test-tubes, frozen, gleaming sperm-like histories
Will be what remains of our love-making —
The tiny Jacks and Jills that have survived to tell the story,
To sing our love-sick-song.

—June Zaner, July 2002

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Sources: Joshua Lederberg's quote appears in an article published in the *Washington Post* and is cited by Leon R. Kass, "The Wisdom of Repugnance," *New Republic* (June 2, 1997), and Kass's article was later published along with a supposed rebuttal article by James Q. Wilson, in the volume, *The Ethics of Human Cloning* (The American Enterprise Institute Press, 1998); Ian Wilmut's "quite inhuman" remark is found at www.cnn.com (March 12, 1997); Leon Kass's three main objections to cloning are reiterations of objections made by Hans Jonas, in his *Philosophical Essays: From Ancient Creed to Technological Man* (Prentice-Hall, 1974) and also Paul Ramsey's "Shall We 'Reproduce'? II. Rejoinders and Future Forecast," *Journal of the American Medical Association*, vol. 220 (1972); The "voices of grassroots Americans" description occurs in: *Letter to President William J. Clinton from the American Bioethics Advisory Commission* (a project of American Life League, Inc., Stafford, VA), June 21, 1997; "Ban Human Cloning," *Report of the American Bioethics Advisory Commission*, unpublished, a Project of American Life League, Inc., 1179 Courthouse Rd., Stafford, VA 22554 (the Report was sent to President Clinton on June 21, 1997); Wendy Doniger, *The Bedtrick: Tales of Sex and Masquerade* (University of Chicago Press, 2000); Stephen Jay Gould, "Dolly's Fashion and Louis's Passion," in *Clones and Clones: Facts and Fantasies About Human Cloning*, edited by Martha C. Nussbaum and Cass R. Sunstein (W. W. Norton & Co., 1998). Gould, who, at the time of his death, was Alexander Agassiz Professor of Zoology and Professor of Geology at Harvard University and was also widely acknowledged as a preeminent theorist of evolution, offers as proof that "differences of nurture guarantee the individuality and personhood of each human clone" by citing the failures to clone Hitler in *The Boys from Brazil*, and the remarkable individuality evidenced in the famous case of Eng and Chang, the original Siamese twins: one was "a morose alcoholic, the other remained a benign and cheerful man." Nancy L. Segal, *Entwined Lives: Twins and What They Tell Us About Human Behavior* (Penguin, 2000, and republished from the 1999 Dutton edition); Richard Dawkins, "What's Wrong with Cloning?" appears in the Nussbaum and Sunstein anthology, as does George Johnson, "Soul Searching;" all quotes from Mark D. Eibert, Esq. occur in "Human Cloning: Myths, Medical Benefits and Constitutional Rights," *U&I Magazine*, and available from the Human Cloning Foundation at http://www.humancloning.org/users/infertil/human-cloning/htm; for a discussion of IVF success rates and how they are determined, see the Center for Disease Control's site at: http://www.cdc.gov/nccdphp/drh/ART00/PDF's/ART2000.pdf; Louise Vandelac and Marie-Hélène Bacon, "Will We Be Taught Ethics by Our Clones? The Mutations of the Living, From Endocrine Disruptors to Genetics," *Baillière's Clinical Obstetrics and Gynaecology*, vol. 13 (1999).

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