Chapter Five

The Ethics of Cloning-to-Produce-Children

Cloning-to-produce-children has been the subject of two major national reports in recent years—first by the National Bioethics Advisory Commission in June 1997,[1] and more recently by the National Academy of Sciences in January 2002.[2] Both reports concluded that attempts to clone a human being "at this time" would be unethical, owing to questions about the safety of the technique and the likelihood of physical harm to those involved. But both reports also concluded that the nation required much deeper reflection about the "ethical and social implications" of cloning-to-produce-children beyond the scientific and medical aspects of the procedure. As the National Academy of Sciences report stated:

> Our present opposition to human reproductive cloning is based on science and medicine, irrespective of broader considerations. The panel stresses, however, that a broad ethical debate must be encouraged so that the public can be prepared to make decisions if human reproductive cloning is some day considered medically safe for mothers and offspring.[3]

In this chapter we attempt to take up this charge to engage in a broad ethical consideration of the merits of cloning-to-produce-children.

The prospect of cloning-to-produce-children raises a host of moral questions, among them the following: Could the first attempts to clone a human child be made without violating accepted moral norms governing experimentation on human subjects? What harms might be inflicted on the cloned child as a consequence of having been made a clone? Is it significant that the cloned child would inherit a genetic identity lived in advance by another—and, in some cases, the genetic identity of the cloned child's rearing parent? Is it significant that cloned children would be the first human beings whose genetic identity was entirely known and selected in advance? How might cloning-to-produce-children affect relationships within the cloning families? More generally, how might it affect the relationship between the generations? How might it affect the way society comes to view children? What other prospects would we be tacitly approving in advance by accepting this practice? What important human goods might be enhanced or sacrificed were we to approve cloning-to-produce-children?

In what follows, we shall explicitly consider many of these questions. But as we do so, we shall not lose sight of the larger and fundamental human contexts discussed in Chapter One—namely, the meaning of human procreation and care of children, the means and ends of biotechnology, and the relation between science and society. Indeed, overarching our entire discussion of the *specific* ethical issues is our concern for the human significance of procreation as a whole and our desire to protect what is valuable in it from erosion and degradation—not just from cloning but from other possible technological and nontechnological dangers. Readers of this report are encouraged to consider the discussion that follows in a similar light.

We will begin by formulating the best moral case for cloning-to-produce-children—describing both the specific purposes it might serve and the philosophic and moral arguments made in its favor. From there we will move to the moral case against cloning-to-produce-children. Beginning with the safety objections that have dominated the debate thus far, we will show how these concerns ultimately point beyond themselves toward

broader ethical concerns. Chief among these is how cloning-to-produce-children would challenge the basic nature of human procreation and the meaning of having children. We shall also consider cloning's effects on human identity, how it might move procreation toward a form of manufacture or toward eugenics, and how it could distort family relations and affect society as a whole.

* * *

I. The Case for Cloning-to-Produce-Children

Arguments in defense of cloning-to-produce-children often address questions of reproduction, but they tend to focus on only a relatively narrow sliver of the goods and principles involved. This certainly does not mean that such arguments lack merit. Indeed, some of the arguments in favor of cloning-to-produce-children appeal to the deepest and most meaningful of our society's shared values.

A. Purposes

In recent years, in anticipation of cloning-to-produce-children, proponents have articulated a variety of possible uses of a perfected technology: providing a "biologically related child" for an infertile couple; permitting reproduction for single individuals or same-sex couples; avoiding the risk of genetic disease; securing a genetically identical source of organs or tissues perfectly suitable for transplantation; "replacing" a loved spouse or child who is dying or has died; obtaining a child with a genotype of one's own choosing (including one's own genotype); replicating individuals of great genius, talent, or beauty, or individuals possessing traits that are for other reasons attractive to the cloners; and creating sets of genetically identical humans who might have special advantages in highly cooperative ventures in both war and peace.[4] The desire to control or select the genomes of children-to-be through cloning has charmed more than a few prospective users, in the United States and around the world.

Although we appreciate that a perfected technology, once introduced for one purpose, might then be used for any of these purposes, we shall examine further only those stated purposes that seem to us to merit serious consideration.

1. To Produce Biologically Related Children

Human cloning would allow individuals or couples with fertility problems to have biologically related children. For example, if a man could not produce sperm, cloning would allow him to have a child who is "biologically related" to him. In addition, it would allow married couples with fertility problems to avoid using donor gametes, and therefore avoid raising children with genetic inheritances from outside the marriage.

2. To Avoid Genetic Disease

Human cloning could allow couples at risk of generating children with genetic disease to have healthy children. For example, if both parents carried one copy of a recessive gene for the same heritable disorder, cloning might allow them to ensure that their child does not inherit the known genetic disease (without having to resort to using donor gametes or practicing preimplantation or prenatal genetic diagnosis and elimination of afflicted embryos or fetuses).

3. To Obtain "Rejection-Proof" Transplants

Human cloning could produce ideal transplant donors for people who are sick or dying. For example, if no genetic match could be found for a sick child needing a kidney or bone marrow transplant, and the parents had planned to have another child, cloning could potentially serve the human goods of beginning a new life and saving an existing one.

4. To "Replicate" a Loved One

Human cloning would allow parents to "replicate" a dead or dying child or relative. For example, one can imagine a case in which a family—mother, father, and child—is involved in a terrible car accident in which the father dies instantly and the child is critically injured. The mother, told that her child will soon die, decides that the best way to redeem the tragedy is to clone her dying child. This would allow her to preserve a connection with

both her dead husband and her dying child, to create new life as a partial human answer to the grievous misfortune of her child's untimely death, and to continue the name and biological lineage of her deceased husband.

5. To Reproduce Individuals of Great Genius, Talent, or Beauty

Human cloning would allow families or society to reproduce individuals of great genius, talent, or beauty, where these traits are presumed to be based on the individuals' desirable or superior genetic makeups. For example, some admirers of great athletes, musicians, or mathematicians, believing that the admired attributes are the result of a superior genetic endowment, might want to clone these distinguished individuals. Just as the cloning of cattle is being promoted as a means of perpetuating champion milk- or meat-producing cows, so cloning-to-produce-children has been touted as a means of perpetuating certain "superior" human exemplars.

B. Arguments

The purposes or reasons for cloning-to-produce-children are, as they are stated, clearly intelligible on their face. When challenged, the defenders of these purposes often appeal to larger moral and political goods. These typically fall within the following three categories: human freedom, existence, and well-being.

1. The Goodness of Human Freedom

Strictly speaking, the appeal to human freedom is not so much a defense of cloning itself as it is of the *right* to practice it, asserted against those who seek to prohibit it. No one, we suspect, would say that he wanted to clone himself or any one else in order to be free or to vindicate the goodness of liberty. Nevertheless, human freedom is a defense often heard in support of a "right" to clone.

Those who defend cloning-to-produce-children on the grounds of human freedom make two kinds of arguments. The first is

that because individuals in pluralistic societies have different definitions of the good life and of right and wrong, society must protect individual freedom to choose against the possible tyranny of the majority. This means securing and even expanding the rights of individuals to make choices so long as their choices do not directly infringe on the rights (and especially the physical safety) of other rights-bearing citizens. In *Eisenstadt v. Baird* (1972), the United States Supreme Court enunciated what has been called a principle of reproductive freedom: "If the right to privacy means anything, it is the right of the individual, married or single, to be free from unwarranted governmental intrusion into matters so affecting a person as a decision whether to bear or beget a child."[5] Defenders of cloning-to-produce-children argue that, in the event that the physical risks to mother and future child were shown to be ethically acceptable, the use of this new reproductive technology would fall under the protective umbrella of reproductive freedom.

A second defense of human cloning on the grounds of freedom is the claim that human existence is by its very nature "open-ended," "indeterminate," and "unpredictable." Human beings are always remaking themselves, their values, and their ways of interacting with one another. New technologies are central to this open-ended idea of human life, and to shut down such technologies simply because they change the "traditional" ways of doing things is unjustifiable. As constitutional scholar Laurence Tribe has argued in reference to human cloning: "A society that bans acts of human creation that reflect unconventional sex roles or parenting models (surrogate motherhood, in vitro fertilization, artificial insemination, and the like) for no better reason than that such acts dare to defy 'nature' and tradition (and to risk adding to life's complexity) is a society that risks cutting itself off from vital experimentation and risks sterilizing a significant part of its capacity to grow."[6]

2. The Goodness of Existence

Like the appeal to freedom, the appeal to the goodness of existence is not an argument *for* cloning, but an argument *against* op-

ponents who speak up in the name of protecting the cloned child-to-be against the harms connected with its risky and strange origins as a clone. This argument asserts that attempts to produce children through cloning, like *any* attempt to produce a child, will directly benefit the cloned-child-to-be, since without the act of cloning the child in question would not exist. Existence itself, it is argued, is the first "interest" that makes all other interests—including the interests of safety and well-being—possible. Even taking into account the possibility of serious genetic or developmental disorders, this position holds that a cloned individual, once born, would prefer existence as a clone to no existence at all. There is also a serious corollary about how, in the absence of a principle that values existence *as such*, we will and should regard and treat people born with disabilities or deformities: opponents of cloning might appear in a position of intolerance—of saying to cloned individuals, "Better for us (and for you) had you never existed."

3. The Goodness of Well-Being

The third moral argument for cloning-to-produce-children is that it would contribute in certain cases to the fulfillment of human goods that are widely honored and deeply rooted in modern democratic society. These human goods include the health of newborn and existing children, reproductive possibilities for infertile couples, and the possibility of having a biologically related child. In all these circumstances, human cloning could relieve existing suffering and sorrow or prevent them in the future. Those who take this position do not necessarily defend human cloning-to-produce-children as such. Rather, they argue that a moral and practical line can be drawn between cloning-to-produce-children that serves the "therapeutic" aims of health (for the cloned child-to-be, for the infertile couple, or for an existing child) and the "eugenic" aims of producing or mass-producing superior people.

Some people argue more broadly that an existing generation has a responsibility to ensure, to the extent possible, the genetic quality and fitness of the next generation. Human cloning, they

argue, offers a new method for human control and self-improvement, by allowing families to have children free of specific genetic diseases or society to reproduce children with superior genetic endowments. It also provides a new means for gaining knowledge about the age-old question of nature versus nurture in contributing to human achievement and human flourishing, and to see how clones of great geniuses measure up against the "originals."

C. Critique and Conclusion

While we as a Council acknowledge merit in some of the arguments made for cloning-to-produce-children, we are generally not persuaded by them. The fundamental weakness of the proponents' case is found in their incomplete view of human procreation and families, and especially the place and well-being of children. Proponents of cloning tend to see procreation primarily as the free exercise of a parental right, namely, a right to satisfy parental desires for self-fulfillment or a right to have a child who is healthy or "superior." Parents seek to overcome obstacles to reproduction, to keep their children free of genetic disease or disorder, and to provide them with the best possible genetic endowment. The principles guiding such prospective parents are freedom (for themselves), control (over their child), and well-being (both for themselves and what they imagine is best for their child). Even taken together, these principles provide at best only a partial understanding of the meaning and entailments of human procreation and child-rearing. In practice, they may prove to undermine the very goods that the proponents of cloning aim to serve, by undermining the unconditional acceptance of one's offspring that is so central to parenthood.

There are a number of objections—or at the very least limitations—to viewing cloning-to-produce-children through the prism of rights. Basic human rights are usually asserted on behalf of the human individual agent: for example, a meaningful right *not to be prevented* from bearing a child can be asserted for each individual against state-mandated sterilization programs. But the act of procreation is not an act involving a single individual. In-

deed, until human cloning arrives, it continues to be impossible for any one person to procreate alone. More important, there is a crucial third party involved: the child, whose centrality to the activity exposes the insufficiency of thinking about procreation in terms of rights.

After all, rights are limited in the following crucial way: they cannot be ethically exercised at the expense of the rights of another. But the "right to reproduce" cannot be ethically exercised without at least considering the child that such exercise will bring into being and who is at risk of harm and injustice from the exercise. This obligation cannot be waived by an appeal to the absolutist argument of the goodness of existence. Yes, existence is a primary good, but that does not diminish the ethical significance of knowingly and willfully putting a child in grave physical danger in the very act of giving that child existence. It is certainly true that a life with even severe disability may well be judged worth living by its bearer: "It is better to have been born as I am than not to be here at all." But if his or her disability was caused by behavior that could have been avoided by parents (for example, by not drinking or using drugs during pregnancy, or, arguably, by not cloning), many would argue that they should have avoided it. A post- facto affirmation of existence by the harmed child would not retroactively excuse the parental misconduct that caused the child's disability, nor would it justify their failure to think of the child's well-being as they went about exercising their "right to procreate." Indeed, procreation is, by its very nature, a limitation of absolute rights, since it brings into existence another human being toward whom we have responsibilities and duties.

In short, the right to decide "*whether* to bear or beget a child" does not include a right to have a child *by whatever means*. Nor can this right be said to imply a corollary—the right to decide what *kind* of child one is going to have. There are at least some circumstances where reproductive freedom must be limited to protect the good of the child (as, for instance, with the ban on incest). Our society's commitment to freedom and parental authority by no means implies that all innovative procedures and

practices should be allowed or accepted, no matter how bizarre or dangerous.

Proponents of cloning, when they do take into account the interests of the child, sometimes argue that this interest justifies and even requires thoroughgoing parental control over the procreative process. Yet this approach, even when well-intentioned, may undermine the good of the child more than it serves the child's best interests. For one thing, cloning-to-produce-children of a desired or worthy sort overlooks the need to restrain the parental temptation to total mastery over children. It is especially morally dubious for this project to go forward when we know so little about the unforeseen and unintended consequences of exercising such genetic control. In trying by cloning to circumvent the risk of genetic disease or to promote particular traits, it is possible—perhaps likely—that new risks to the cloned child's health and fitness would be inadvertently introduced (including the forgoing of genetic novelty, a known asset in the constant struggle against microbial and parasitic diseases). Parental control is a double-edged sword, and proponents seem not to acknowledge the harms, both physical and psychological, that may befall the child whose genetic identity is selected in advance.

The case for cloning in the name of the child's health and well-being is certainly the strongest and most compelling. The desire that one's child be free from a given genetic disease is a worthy aspiration. We recognize there may be some unusual or extreme cases in which cloning might be the best means to serve this moral good, if other ethical obstacles could somehow be overcome. (A few of us also believe that the desire to give a child "improved" or "superior" genetic equipment is not necessarily to be condemned.) However, such aspirations could endanger the personal, familial, and societal goods supported by the character of human procreation. We are willing to grant that there may be exceptional cases in which cloning-to-produce-children is morally defensible; however, that being said, we would also argue that such cases do not justify the harmful experiments and social problems that might be entailed by engaging in human cloning. Hard cases are said to make bad law. The same would

be true for succumbing to the rare, sentimentally appealing case in which cloning seems morally plausible.*

Finally, proponents do not adequately face up to the difficulty of how "well-being" is to be defined. Generally, they argue that these matters are to be left up to the free choices of parents and doctors. But this means that the judgments of "proper" and "improper" will be made according to subjective criteria alone, and under such circumstances, it will be almost impossible to rule out certain "improvements" as unacceptable.

In the sections that follow, we shall explain more fully why Members of the Council are not convinced by the arguments for cloning-to-produce-children, even in the most defensible cases. To see why this is so, we need to consider cloning-to-produce-children from the broadest possible moral perspective, beginning with ethical questions regarding experiments on human subjects. What we hope to show is that the frequently made safety arguments strike deeper than we usually realize, and that they point beyond themselves toward more fundamental moral objections to cloning-to-produce-children.

* * *

* Consider the following analogy: We would not allow a rare sympathetic case for brother-sister marriage—where, say, the two children were separated at birth and later fell in love, ignorant of their kinship—to overturn the taboo on incest. Whatever their merit, the goals of well-being and health do not outweigh the moral and social harms that cloning would entail.

II. The Case against Cloning-to-Produce-Children

A. The Ethics of Human Experimentation

We begin with concerns regarding the safety of the cloning procedure and the health of the participants. We do so for several reasons. First, these concerns are widely, indeed nearly unanimously, shared. Second, they lend themselves readily to familiar modes of ethical analysis—including concerns about harming the innocent, protecting human rights, and ensuring the consent of all research subjects. Finally, if carefully considered, these concerns begin to reveal the important ethical principles that must guide our broader assessment of cloning-to-produce-children. They suggest that human beings, unlike inanimate matter or even animals, are in some way *inviolable*, and therefore challenge us to reflect on what it is *about* human beings that makes them inviolable, and whether cloning-to-produce-children threatens these distinctly human goods.

In initiating this analysis, there is perhaps no better place to start than the long-standing international practice of regulating experiments on human subjects. After all, the cloning of a human being, as well as all the research and trials required before such a procedure could be expected to succeed, would constitute experiments on the individuals involved—the egg donor, the birthing mother, and especially the child-to-be. It therefore makes sense to consider the safety and health concerns that arise from cloning-to-produce-children in light of the widely shared ethical principles that govern experimentation on human subjects.

Since the Second World War, various codes for the ethical conduct of human experimentation have been adopted around the world. These codes and regulations were formulated in direct response to serious ethical lapses and violations committed by research scientists against the rights and dignity of individual human beings. Among the most important and widely accepted

documents to emerge were the Nuremberg Code of 1947[7] and the Helsinki Declaration of 1964.[8] Influential in the United States is also the Belmont Report, published in 1978 by the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research.[9]

The Nuremberg Code laid out ten principles for the ethical conduct of experiments, focusing especially on voluntary consent of research subjects, the principle that experiments should be conducted only with the aim of providing a concrete good for society that is unprocurable by other methods, and with the avoidance of physical or mental harm. The Helsinki Declaration stated, among other things, that research should be undertaken only when the prospective benefit clearly outweighs the expected risk, when the research subject has been fully informed of all risks, and when the research-subject population is itself likely to benefit from the results of the experiment.

Finally, the Belmont Report proposed three basic ethical principles that were to guide the treatment of human subjects involved in scientific research. The first of these is *respect for persons*, which requires researchers to acknowledge the autonomy and individual rights of research subjects and to offer special protection to those with diminished autonomy and capacity. The second principle is *beneficence*. Scientific research must not only refrain from harming those involved but must also be aimed at helping them, or others, in concrete and important ways. The third principle is *justice*, which involves just distribution of potential benefits and harms and fair selection of research subjects. When applied, these general principles lead to both a requirement for informed consent of human research subjects and a requirement for a careful assessment of risks and benefits before proceeding with research. Safety, consent, and the rights of research subjects are thus given the highest priority.

It would be a mistake to view these codes in narrow or procedural terms, when in fact they embody society's profound sense that human beings are not to be treated as experimental guinea pigs for scientific research. Each of the codes was created to ad-

dress a specific disaster involving research science—whether the experiments conducted by Nazi doctors on concentration camp prisoners, or the Willowbrook scandal in which mentally retarded children were infected with hepatitis, or the Tuskegee scandal in which underprivileged African-American men suffering from syphilis were observed but not treated by medical researchers—and each of the codes was an attempt to defend the inviolability and dignity of all human beings in the face of such threats and abuses. More simply stated, the codes attempt to defend the weak against the strong and to uphold the equal dignity of all human beings. In taking up the application of these codes to the case of cloning-to-produce-children, we would suggest that the proper approach is not simply to discover specific places where human cloning violates this or that stipulation of this or that code, but to grapple with how such cloning offends the spirit of these codes and what they seek to defend.

The ethics of research on human subjects suggest three sorts of problems that would arise in cloning-to-produce-children: (1) problems of safety; (2) a special problem of consent; and (3) problems of exploitation of women and the just distribution of risk. We shall consider each in turn.

1. Problems of Safety

First, cloning-to-produce-children is not now safe. Concerns about the safety of the individuals involved in a cloning procedure are shared by nearly everyone on all sides of the cloning debate. Even most proponents of cloning-to-produce-children generally qualify their support with a caveat about the safety of the procedure. Cloning experiments in other mammals strongly suggest that cloning-to-produce-children is, at least for now, far too risky to attempt.[10] Safety concerns revolve around potential dangers to the cloned child, as well as to the egg donor and the woman who would carry the cloned child to birth.

(a) Risks to the child. Risks to the cloned child-to-be must be taken especially seriously, both because they are most numerous and most serious and because—unlike the risks to the egg donor

and birth mother—they cannot be accepted knowingly and freely by the person who will bear them. In animal experiments to date, only a small percentage of implanted clones have resulted in live births, and a substantial portion of those live-born clones have suffered complications that proved fatal fairly quickly. Some serious though nonfatal abnormalities in cloned animals have also been observed, including substantially increased birth-size, liver and brain defects, and lung, kidney, and cardiovascular problems.[11]

Longer-term consequences are of course not known, as the oldest successfully cloned mammal is only six years of age. Medium-term consequences, including premature aging, immune system failure, and sudden unexplained death, have already become apparent in some cloned mammals. Some researchers have also expressed concerns that a donor nucleus from an individual who has lived for some years may have accumulated genetic mutations that—if the nucleus were used in the cloning of a new human life—may predispose the new individual to certain sorts of cancer and other diseases.[12]

(b) Risks to the egg donor and the birth mother. Accompanying the threats to the cloned child's health and well-being are risks to the health of the egg donors. These include risks to her future reproductive health caused by the hormonal treatments required for egg retrieval and general health risks resulting from the necessary superovulation.[13]

Animal studies also suggest the likelihood of health risks to the woman who carries the cloned fetus to term. The animal data suggest that late-term fetal losses and spontaneous abortions occur substantially more often with cloned fetuses than in natural pregnancies. In humans, such late-term fetal losses may lead to substantially increased maternal morbidity and mortality. In addition, animal studies have shown that many pregnancies involving cloned fetuses result in serious complications, including toxemia and excessive fluid accumulation in the uterus, both of which pose risks to the pregnant animal's health.[14] In one prominent

cattle cloning study, just under one-third of the pregnant cows died from complications late in pregnancy.[15]

Reflecting on the dangers to birth mothers in animal cloning studies, the National Academy report concluded:

> Results of animal studies suggest that reproductive cloning of humans would similarly pose a high risk to the health of both fetus or infant and mother and lead to associated psychological risks for the mother as a consequence of late spontaneous abortions or the birth of a stillborn child or a child with severe health problems.[16]

(c) An abiding moral concern. Because of these risks, there is widespread agreement that, at least for now, attempts at cloning-to-produce-children would constitute unethical experimentation on human subjects and are therefore impermissible. These safety considerations were alone enough to lead the National Bioethics Advisory Commission in June 1997 to call for a temporary prohibition of human cloning-to-produce-children. Similar concerns, based on almost five more years of animal experimentation, convinced the panel of the National Academy of Sciences in January 2002 that the United States should ban such cloning for at least five years.

Past discussions of this subject have often given the impression that the safety concern is a purely temporary one that can be allayed in the near future, as scientific advances and improvements in technique reduce the risks to an ethically acceptable level. But this impression is mistaken, for considerable safety risks are likely to be enduring, perhaps permanent. If so, there will be abiding ethical difficulties *even with efforts aimed at making human cloning safe*.

The reason is clear: experiments to develop new reproductive technologies are necessarily intergenerational, undertaken to serve the reproductive desires of prospective parents but practiced also and always upon prospective children. Any such ex-

periment unavoidably involves risks to the child-to-be, a being who is both the *product* and also the most vulnerable human *subject* of the research. Exposed to risk during the extremely sensitive life-shaping processes of his or her embryological development, any child-to-be is a singularly vulnerable creature, one maximally deserving of protection against risk of experimental (and other) harm. If experiments to learn how to clone a child are ever to be ethical, the degree of risk to that child-to-be would have to be extremely low, arguably no greater than for children-to-be who are conceived from union of egg and sperm. It is extremely unlikely that this moral burden can be met, not for decades if at all.

In multiple experiments involving six of the mammalian species cloned to date, more than 89 percent of the cloned embryos transferred to recipient females did not come to birth, and many of the live-born cloned animals are or become abnormal.[17] If success means achieving normal and healthy development not just at birth but throughout the life span, there is even less reason for confidence. The oldest cloned mammal (Dolly) is only six years old and has exhibited unusually early arthritis. The reasons for failure in animal cloning are not well understood. Also, no nonhuman primates have been cloned. It will be decades (at least) before we could obtain positive evidence that cloned primates might live a normal healthy (primate) life.

Even a high success rate in animals would not suffice by itself to make human trials morally acceptable. In addition to the usual uncertainties in jumping the gap from animal to human research, cloning is likely to present particularly difficult problems of interspecies difference. Animal experiments have already shown substantial differences in the reproductive success of identical cloning techniques used in different species.[18] If these results represent species-specific differences in, for example, the ease of epigenetic reprogramming and imprinting of the donor DNA, the magnitude of the risks to the child-to-be of the first human cloning experiments would be unknown and potentially large, no matter how much success had been achieved in animals. There

can in principle be no direct experimental evidence sufficient for assessing the degree of such risk.*

Can a highly reduced risk of deformity, disease, and premature death in animal cloning, coupled with the inherently unpredictable risk of moving from animals to humans, ever be low enough to meet the ethically acceptable standard set by reproduction begun with egg and sperm? The answer, as a matter of necessity, can never be better than "Just possibly." Given the severity of the possible harms involved in human cloning, and given that those harms fall on the very vulnerable child-to-be, such an answer would seem to be enduringly inadequate.

Similar arguments, it is worth noting, were made before the first attempts at human in vitro fertilization. People suggested that it would be unethical experimentation even to try to determine whether IVF could be safely done. And then, of course, IVF was accomplished. Eventually, it became a common procedure, and today the moral argument about its safety seems to many people beside the point. Yet the fact of success in that case does not establish precedent in this one, nor does it mean that the first attempts at IVF were not in fact unethical experiments upon the unborn, despite the fortunate results.†

Be this as it may, the case of cloning is genuinely different. With IVF, assisted fertilization of egg by sperm immediately releases a

---

* It is of course true that there is always uncertainty about moving from animal to human experimentation or therapy. But in the usual case, what justifies the assumption of this added unknown risk is that the experimental subject is a likely beneficiary of the research, either directly or indirectly. And where this is not the case, risk may be assumed if there is informed and voluntary consent. Neither of these conditions applies for the child-to-be in human cloning experiments.

† Surprisingly, there has been very little systematic study of the offspring of in vitro fertilization. One recently published study has suggested that IVF (and especially intracytoplasmic sperm injection [ICSI]) may not be as benign as we had thought (Hansen, M., et al., "The Risk of Major Birth Defects after Intracytoplasmic Sperm Injection and In Vitro Fertilization," *New Eng. J. Med.* 346: 725-730, 2002).

developmental process, linked to the sexual union of the two gametes, that nature has selected over millions of years for the entire mammalian line. But in cloning experiments to produce children, researchers would be transforming a sexual system into an asexual one, a change that requires major and "unnatural" reprogramming of donor DNA if there is to be any chance of success. They are neither enabling nor restoring a natural process, and the alterations involved are such that success in one species cannot be presumed to predict success in another. Moreover, any new somatic mutations in the donor cell's chromosomal DNA would be passed along to the cloned child-to-be and its offspring. Here we can see even more the truly intergenerational character of cloning experimentation, and this should justify placing the highest moral burden of persuasion on those who would like to proceed with efforts to make cloning safe for producing children. (By reminding us of the need to protect the lives and well-being of our children and our children's children, this broader analysis of the safety question points toward larger moral objections to producing cloned children, objections that we shall consider shortly.)

It therefore appears to us that, given the dangers involved and the relatively limited goods to be gained from cloning-to-produce-children, conducting experiments in an effort to make cloning-to-produce-children safer would itself be an unacceptable violation of the norms of the ethics of research. *There seems to be no ethical way to try to discover whether cloning-to-produce-children can become safe, now or in the future.*

2. A Special Problem of Consent

A further concern relating to the ethics of human research revolves around the question of consent. Consent from the cloned child-to-be is of course impossible to obtain, and because no one consents to his or her own birth, it may be argued that concerns about consent are misplaced when applied to the unborn. But the issue is not so simple. For reasons having to do both with the safety concerns raised above and with the social, psychological, and moral concerns to be addressed below, an at-

tempt to clone a human being would potentially expose a cloned individual-to-be to great risks of harm, quite distinct from those accompanying other sorts of reproduction. Given the risks, and the fact that consent cannot be obtained, the ethically correct choice may be to avoid the experiment. The fact that those engaged in cloning cannot ask an unconceived child for permission places a burden on the cloners, not on the child. Given that anyone considering creating a cloned child must know that he or she is putting a newly created human life at exceptional risk, the burden on the would-be cloners seems clear: they must make a compelling case why the procedure should not be avoided altogether.[*]

Reflections on the purpose and meaning of seeking consent support this point. Why, after all, does society insist upon consent as an essential principle of the ethics of scientific research? Along with honoring the free will of the subject, we insist on consent to protect the weak and the vulnerable, and in particular to protect them from the powerful. It would therefore be morally questionable, at the very least, to choose to impose potentially grave harm on an individual, especially in the very act of giving that individual life. Giving existence to a human being does not grant one the right to maim or harm that human being in research.

3. Problems of Exploitation of Women and Just Distribution of Risk

Cloning-to-produce-children may also lead to the exploitation of women who would be called upon to donate oocytes. Widespread use of the techniques of cloning-to-produce-children would require large numbers of eggs. Animal models suggest that several hundred eggs may be required before one attempt at cloning can be successful. The required oocytes would have to be donated, and the process of making them available would involve hormonal treatments to induce superovulation. If financial incentives are offered, they might lead poor women especially to

[*] The argument made in this paragraph is not unique to cloning. There may be other circumstances in which prospective parents, about to impose great risk of harm on a prospective child-to-be, might bear a comparable burden.

place themselves at risk in this way (and might also compromise the voluntariness of their "choice" to make donations). Thus, research on cloning-to-produce-children could impose disproportionate burdens on women, particularly low-income women.

4. Conclusion

These questions of the ethics of research—particularly the issue of physical safety—point clearly to the conclusion that cloning-to-produce-children is unacceptable. In reaching this conclusion, we join the National Bioethics Advisory Commission and the National Academy of Sciences. But we go beyond the findings of those distinguished bodies in also pointing to the dangers that will *always* be inherent in the very process of trying to make cloning-to-produce-children safer. On this ground, we conclude that the problem of safety is not a temporary ethical concern. It is rather an enduring moral concern that might not be surmountable and should thus preclude work toward the development of cloning techniques to produce children. In light of the risks and other ethical concerns raised by this form of human experimentation, *we therefore conclude that cloning-to-produce-children should not be attempted.*

For some people, the discussion of ethical objections to cloning-to-produce-children could end here. Our society's established codes and practices in regard to human experimentation by themselves offer compelling reasons to oppose indefinitely attempts to produce a human child by cloning. But there *is* more to be said.

First, many people who are repelled by or opposed to the prospect of cloning human beings are concerned not simply or primarily because the procedure is unsafe. To the contrary, their objection is to the use of a *perfected* cloning technology and to a society that would embrace or permit the production of cloned children. The ethical objection based on lack of safety is *not* really an objection to cloning *as such*. Indeed, it may in time become a vanishing objection should people be allowed to proceed—despite insuperable ethical objections such as the ones we

have just offered—with experiments to perfect the technique.* Should this occur, the ethical assessment of cloning-to-produce-children would need to address itself to the merits (and demerits) of cloning itself, beyond the safety questions tied to the techniques used to produce cloned children. Thus, anticipating the possibility of a perfected and usable technology, it is important to delineate the case against the practice itself.

Moreover, because the Council is considering cloning within a broad context of present and projected techniques that can affect human procreation or alter the genetic makeup of our children, it is important that we consider the full range and depth of ethical issues raised by such efforts.

How should these issues be raised, and within what moral framework? Some, but by no means all, of the deepest moral concerns connected to human cloning could be handled by developing a richer consideration of the ethics of human experimentation. Usually—and regrettably—we apply the ethical principles governing research on human subjects in a utilitarian spirit, weighing benefits versus harms, and moreover using only a very narrow notion of "harm." The calculus that weighs benefits versus harms too often takes stock only of bodily harm or violations of patient autonomy, though some serious efforts have been made in recent years to consider broader issues. In addition, we often hold a rather narrow view of what constitutes "an experiment." Yet cloning-to-produce-children would be a "human experiment" in many senses, and risks of bodily harm and inadequate consent do not exhaust the ways in which cloning might do damage. As we have described, cloning-to-produce-children would be a *biological experiment*—with necessary uncertainties about the safety of the technique and the possibility of physical harm. But it would also be an *experiment in human procreation*—substituting asexual for sexual reproduction and treating children not as gifts but as our self-designed products. It

* Such improvements in technique could result in part from the practice of cloning-for-biomedical-research, were it to be allowed to go forward. This possibility is one of the issues we shall consider in evaluating the ethics of cloning-for-biomedical-research in Chapter Six.

would be an *experiment in human identity*—creating the first human beings to inherit a genetic identity lived in advance by another. It would be an *experiment in genetic choice and design*—producing the first children whose entire genetic makeup was selected in advance. It would be an *experiment in family and social life*—altering the relationships within the family and between the generations, for example, by turning "mothers" into "twin sisters" and "grandparents" into "parents," and by having children asymmetrically linked biologically to only one parent. And it would represent a *social experiment* for the entire society, insofar as the society accepted, even if only as a minority practice, this unprecedented and novel mode of producing our offspring.

By considering these other ways in which cloning would constitute an experiment, we could enlarge our analysis of the ethics of research with human subjects to assess possible *nonbodily* harms of cloning-to-produce-children. But valuable as this effort might be, we have not chosen to proceed in this way. Not all the important issues can be squeezed into the categories of harms and benefits. People can be mistreated or done an injustice whether they know it or not and quite apart from any experienced harm. Important human goods can be traduced, violated, or sacrificed without being registered in anyone's catalogue of harms. The form of bioethical inquiry we are attempting here will make every effort not to truncate the moral meaning of our actions and practices by placing them on the Procrustean bed of utilitarianism. To be sure, the ethical principles governing human research are highly useful in efforts to protect vulnerable individuals against the misconduct or indifference of the powerful. But a different frame of reference is needed to evaluate the human meaning of innovations that may affect the lives and humanity of everyone, vulnerable or not.

Of the arguments developed below, some are supported by most Council Members, while other arguments are shared by only some Members. Even among the arguments they share, different Members find different concerns to be weightier. Yet we all believe that the arguments presented in the sections that follow are worthy of consideration in the course of trying to assess *fully* the

ethical issues involved. We have chosen to err on the side of inclusion rather than exclusion of arguments because we acknowledge that concerns now expressed by only a few may turn out in the future to be more important than those now shared by all. Our fuller assessment begins with an attempt to fathom the deepest meaning of human procreation and thus necessarily the meaning of raising children. Our analysis will then move onto questions dealing with the effects of cloning on individuals, family life, and society more generally.

B. The Human Context: Procreation and Child-Rearing

Were it to take place, cloning-to-produce-children would represent a challenge to the nature of human procreation and child-rearing. Cloning is, of course, not only a means of procreation. It is also a technology, a human experiment, and an exercise of freedom, among other things. But cloning would be most unusual, consequential, and most morally important as a new way of bringing children into the world and a new way of viewing their moral significance.

In Chapter One we outlined some morally significant features of human procreation and raised questions about how these would be altered by human cloning. We will now attempt to deepen that analysis, and begin with the salient fact that a child *is not made, but begotten.* Procreation is not making but the outgrowth of doing. A man and woman give themselves in love to each other, setting their projects aside in order to do just that. Yet a child results, arriving on its own, mysterious, independent, yet the fruit of the embrace.[*] Even were the child wished for, and consciously so, he or she is the issue of their love, not the product of their wills; the man and woman in no way produce or choose a *particular* child, as they might buy a particular car. Procreation can, of course, be assisted by human ingenuity (as with IVF). In such cases, it may become harder to see the child solely as a gift

[*] We are, of course, well aware that many children are conceived in casual, loveless, or even brutal acts of sexual intercourse, including rape and incest.

bestowed upon the parents' mutual self-giving and not to some degree as a product of their parental wills. Nonetheless, because it is still sexual reproduction, the children born with the help of IVF begin—as do all other children—with a certain genetic independence of their parents. They replicate neither their fathers nor their mothers, and this is a salutary reminder to parents of the independence they must one day grant their children and for which it is their duty to prepare them.

Gifts and blessings we learn to accept as gratefully as we can. Products of our wills we try to shape in accord with our desires. Procreation as traditionally understood invites acceptance, rather than reshaping, engineering, or designing the next generation. It invites us to accept limits to our control over the next generation. It invites us even—to put the point most strongly—to think of the child as one who is not simply our own, our possession. Certainly, it invites us to remember that the child does not exist simply for the happiness or fulfillment of the parents.

To be sure, parents do and must try to form and mold their children in various ways as they inure them to the demands of family life, prepare them for adulthood, and initiate them into the human community. But, even then, it is only our sense that these children are not our possessions that makes such parental nurture—which always threatens not to nourish but to stifle the child—safe.

This concern can be expressed not only in language about the relation between the generations but also in the language of equality. The things we make are not just like ourselves; they are the products of our wills, and their point and purpose are ours to determine. But a begotten child comes into the world just as its parents once did, and is therefore their equal in dignity and humanity.

The character of sexual procreation shapes the lives of children as well as parents. By giving rise to genetically new individuals, sexual reproduction imbues all human beings with a sense of individual identity and of occupying a place in this world that has

never belonged to another. Our novel genetic identity symbolizes and foreshadows the unique, never-to-be-repeated character of each human life. At the same time, our emergence from the union of two individuals, themselves conceived and generated as we were, locates us immediately in a network of relation and natural affection.

Social identity, like genetic identity, is in significant measure tied to these biological facts. Societies around the world have structured social and economic responsibilities around the relationship between the generations established through sexual procreation, and have developed modes of child-rearing, family responsibility, and kinship behavior that revolve around the natural facts of begetting.

There is much more to be said about these matters, and they are vastly more complicated than we have indicated. There are, in addition, cultural differences in the way societies around the world regard the human significance of procreation or the way children are to be regarded and cared for. Yet we have said enough to indicate that the character and nature of human procreation matter deeply. They affect human life in endless subtle ways, and they shape families and communities. A proper regard for the profundity of human procreation (including child-rearing and parent-child relations) is, in our view, indispensable for a full assessment of the ethical implications of cloning-to-produce-children.

C. Identity, Manufacture, Eugenics, Family, and Society

Beyond the matter of procreation itself, we think it important to examine the possible psychological and emotional state of individuals produced by cloning, the well-being of their families, and the likely effects on society of permitting human cloning. These concerns would apply even if cloning-to-produce-children were conducted on a small scale; and they would apply in even the more innocent-seeming cloning scenarios, such as efforts to overcome infertility or to avoid the risk of genetic disease. Ad-

mittedly, these matters are necessarily speculative, for empirical evidence is lacking. Nevertheless, the importance of the various goods at stake justifies trying to think matters through in advance.

Keeping in mind our general observations about procreation, we proceed to examine a series of specific ethical issues and objections to cloning human children: (1) problems of identity and individuality; (2) concerns regarding manufacture; (3) the prospect of a new eugenics; (4) troubled family relations; and (5) effects on society.

1. Problems of Identity and Individuality

Cloning-to-produce-children could create serious problems of identity and individuality. This would be especially true if it were used to produce multiple "copies" of any single individual, as in one or another of the seemingly far-fetched futuristic scenarios in which cloning is often presented to the popular imagination. Yet questions of identity and individuality could arise even in small-scale cloning, even in the (supposedly) most innocent of cases, such as the production of a single cloned child within an intact family. Personal identity is, we would emphasize, a complex and subtle psychological phenomenon, shaped ultimately by the interaction of many diverse factors. But it does seem reasonably clear that cloning would at the very least present a unique and possibly disabling challenge to the formation of individual identity.

Cloned children may experience concerns about their distinctive identity not only because each will be genetically essentially identical to another human being, but also because they may resemble in appearance younger versions of the person who is their "father" or "mother." Of course, our genetic makeup does not by itself determine our identities. But our genetic uniqueness is an important source of our sense of who we are and how we regard ourselves. It is an emblem of independence and individuality. It endows us with a sense of life as a never-before-enacted possibility. Knowing and feeling that nobody has previously pos-

sessed our particular gift of natural characteristics, we go forward as genetically unique individuals into relatively indeterminate futures.

These new and unique genetic identities are rooted in the natural procreative process. A cloned child, by contrast, is at risk of living out a life overshadowed in important ways by the life of the "original"—general appearance being only the most obvious. Indeed, one of the reasons some people are interested in cloning is that the technique promises to produce in each case a particular individual whose traits and characteristics are already known. And however much or little one's genotype *actually* shapes one's natural capacities, it could mean a great deal to an individual's *experience* of life and the expectations that those who cloned him or her might have. The cloned child may be constantly compared to "the original," and may consciously or unconsciously hold himself or herself up to the genetic twin that came before. If the two individuals turned out to lead similar lives, the cloned person's achievements may be seen as derivative. If, as is perhaps more likely, the cloned person departed from the life of his or her progenitor, this very fact could be a source of constant scrutiny, especially in circumstances in which parents produced their cloned child to become something in particular. Living up to parental hopes and expectations is frequently a burden for children; it could be a far greater burden for a cloned individual. The shadow of the cloned child's "original" might be hard for the child to escape, as would parental attitudes that sought in the child's very existence to replicate, imitate, or replace the "original."

It may reasonably be argued that genetic individuality is not an indispensable human good, since identical twins share a common genotype and seem not to be harmed by it. But this argument misses the context and environment into which even a single human clone would be born. Identical twins have as progenitors two biological parents and are born together, before either one has developed and shown what his or her potential—natural or otherwise—may be. Each is largely free of the burden of measuring up to or even knowing in advance the genetic traits of

the other, because both begin life together and neither is yet known to the world. But a clone is a genetic near-copy of a person who is already living or has already lived. This might constrain the clone's sense of self in ways that differ in kind from the experience of identical twins. Everything about the predecessor—from physical height and facial appearance, balding patterns and inherited diseases, to temperament and native talents, to shape of life and length of days, and even cause of death—will appear before the expectant eyes of the cloned person, always with at least the nagging concern that there, notwithstanding the grace of God, go I. The crucial matter, again, is not simply the truth regarding the extent to which genetic identity actually shapes us—though it surely does shape us to some extent. What matters is the cloned individual's *perception* of the significance of the "precedent life" and the way that perception cramps and limits a sense of self and independence.

2. Concerns regarding Manufacture

The likely impact of cloning on identity suggests an additional moral and social concern: the transformation of human procreation into human manufacture, of begetting into making. By using the terms "making" and "manufacture" we are not claiming that cloned children would be artifacts made altogether "by hand" or produced in factories. Rather, we are suggesting that they would, like other human "products," be brought into being in accordance with some pre-selected genetic pattern or design, and therefore in some sense "made to order" by their producers or progenitors.

Unlike natural procreation—or even most forms of assisted reproduction—cloning-to-produce-children would set out to create a child with a very particular genotype: namely, that of the somatic cell donor. Cloned children would thus be the first human beings whose entire genetic makeup is selected in advance. True, selection from among existing genotypes is not yet design of new ones. But the principle that would be established by human cloning is both far-reaching and completely novel: parents, with the help of science and technology, may determine in ad-

vance the genetic endowment of their children. To this point, parents have the right and the power to decide *whether* to have a child. With cloning, parents acquire the power, and presumably the right, to decide *what kind* of a child to have. Cloning would thus extend the power of one generation over the next—and the power of parents over their offspring—in ways that open the door, unintentionally or not, to a future project of genetic manipulation and genetic control.

Of course, there is no denying that we have already taken steps in the direction of such control. Preimplantation genetic diagnosis of embryos and prenatal diagnosis of fetuses—both now used to prevent the birth of individuals carrying genes for genetic diseases—reflect an only conditional acceptance of the next generation. With regard to *positive* selection for desired traits, some people already engage in the practice of sex selection, another example of conditional acceptance of offspring. But these precedents pale in comparison to the degree of control provided by cloning and, in any case, do not thereby provide a license to proceed with cloning. It is far from clear that it would be wise to proceed still farther in our attempts at control.

The problem with cloning-to-produce-children is not that artificial technique is used to assist reproduction. Neither is it that genes are being manipulated. We raise no objection to the use of the coming genetic technologies to treat individuals with genetic diseases, even in utero—though there would be issues regarding the protection of human subjects in research and the need to find boundaries between therapy and so-called enhancement (of this, more below). The problem has to do with the control of the entire genotype and the production of children to selected specifications.

Why does this matter? It matters because human dignity is at stake. In natural procreation, two individuals give life to a new human being whose endowments are not shaped deliberately by human will, whose being remains mysterious, and the open-endedness of whose future is ratified and embraced. Parents beget a child who enters the world exactly as they did—as an un-

made gift, not as a product. Children born of this process stand equally beside their progenitors as fellow human beings, not beneath them as made objects. In this way, the uncontrolled beginnings of human procreation endow each new generation and each new individual with the dignity and freedom enjoyed by all who came before.

Most present forms of assisted reproduction imitate this natural process. While they do begin to introduce characteristics of manufacture and industrial technique, placing nascent human life for the first time in human hands, they do not control the final outcome. The end served by IVF is still the same as natural reproduction—the birth of a child from the union of gametes from two progenitors. Reproduction with the aid of such techniques still implicitly expresses a willingness to accept as a gift the product of a process we do not control. In IVF children emerge out of the same mysterious process from which their parents came, and are therefore not mere creatures of their parents.

By contrast, cloning-to-produce-children—and the forms of human manufacture it might make more possible in the future—seems quite different. Here, the process begins with a very specific final product in mind and would be tailored to produce that product. Even were cloning to be used solely to remedy infertility, the decision to clone the (sterile) father would be a decision, willy-nilly, that the child-to-be should be the near-twin of his "father." Anyone who would clone merely to ensure a "biologically related child" would be dictating a very specific form of biological relation: genetic virtual identity. In every case of cloning-to-produce-children, scientists or parents would set out to produce specific individuals for particular reasons. The procreative process could come to be seen increasingly as a means of meeting specific ends, and the resulting children would be products of a designed manufacturing process, products over whom we might think it proper to exercise "quality control." Even if, in any given case, we were to continue to think of the cloned child as a gift, *the act itself teaches a different lesson*, as the child becomes the continuation of a parental project. We would learn to receive

the next generation less with gratitude and surprise than with control and mastery.

One possible result would be the industrialization and commercialization of human reproduction. Manufactured objects become commodities in the marketplace, and their manufacture comes to be guided by market principles and financial concerns. When the "products" are human beings, the "market" could become a profoundly dehumanizing force. Already there is commerce in egg donation for IVF, with ads offering large sums of money for egg donors with high SAT scores and particular physical features.

The concerns expressed here do not depend on cloning becoming a widespread practice. The introduction of the terms and ideas of production into the realm of human procreation would be troubling regardless of the scale involved; and the adoption of a market mentality in these matters could blind us to the deep moral character of bringing forth new life. Even were cloning children to be rare, the moral harms to a society that accepted it could be serious.

3. Prospect of a New Eugenics

For some of us, cloning-to-produce-children also raises concerns about the prospect of eugenics or, more modestly, about genetic "enhancement." We recognize that the term "eugenics" generally refers to attempts to improve the genetic constitution of a particular political community or of the human race through general policies such as population control, forced sterilization, directed mating, or the like. It does not ordinarily refer to actions of particular individuals attempting to improve the genetic endowment of their own descendants. Yet, although cloning does not in itself point to public policies by which the state would become involved in directing the development of the human gene pool, this might happen in illiberal regimes, like China, where the gov-

ernment already regulates procreation.* And, in liberal societies, cloning-to-produce-children could come to be used privately for individualized eugenic or "enhancement" purposes: in attempts to alter (with the aim of improving) the genetic constitution of one's own descendants—and, indirectly, of future generations.

Some people, in fact, see enhancement as the major purpose of cloning-to-produce-children. Those who favor eugenics and genetic enhancement were once far more open regarding their intentions to enable future generations to enjoy more advantageous genotypes. Toward these ends, they promoted the benefits of cloning: escape from the uncertain lottery of sex, controlled and humanly directed reproduction. In the present debate about cloning-to-produce-children, the case for eugenics and enhancement is not made openly, but it nonetheless remains an important motivation for some advocates. Should cloning-to-produce-children be introduced successfully, and should it turn out that the cloned humans do in fact inherit many of the natural talents of the "originals," some people may become interested in the prospects of using it to produce "enhanced children"—especially if other people's children were receiving comparable advantages.

Cloning can serve the ends of individualized enhancement either by avoiding the genetic defects that may arise when human reproduction is left to chance or by preserving and perpetuating outstanding genetic traits. In the future, if techniques of genetic enhancement through more precise genetic engineering became available, cloning could be useful for perpetuating the enhanced traits and for keeping any "superior" manmade genotype free of the flaws that sexual reproduction might otherwise introduce.

---

* According to official Chinese census figures for 2000, more than 116 male births were recorded for every 100 female births. It is generally believed that this is the result of the widespread use of prenatal sex selection and China's one-child policy, though it should be noted that even in a country such as South Korea, which has no such policy, the use of prenatal sex selection has skewed the sex ratio in favor of males.

"Private eugenics" does not carry with it the dark implications of state despotism or political control of the gene pool that characterized earlier eugenic proposals and the racist eugenic practices of the twentieth century. Nonetheless, it could prove dangerous to our humanity. Besides the dehumanizing prospects of the turn toward manufacture that such programs of enhancement would require, there is the further difficulty of the lack of standards to guide the choices for "improvement." To this point, biomedical technology has been applied to treating diseases in patients and has been governed, on the whole, by a commonsense view of health and disease. To be sure, there are differing views about how to define "health." And certain cosmetic, performance-enhancing, or hedonistic uses of biomedical techniques have already crossed any plausible boundary between therapy and enhancement, between healing the sick and "improving" our powers.* Yet, for the most part, it is by some commonsense views of health that we judge who is in need of medical treatment and what sort of treatment might be most appropriate. Even today's practice of a kind of "negative" eugenics—through prenatal genetic diagnosis and abortion of fetuses with certain genetic abnormalities—is informed by the desire to promote health.

The "positive" eugenics that could receive a great boost from human cloning, especially were it to be coupled with techniques of precise genetic modification, would not seek to restore sick human beings to natural health. Instead, it would seek to alter humanity, based upon subjective or arbitrary ideas of excellence. The effort may be guided by apparently good intentions: to improve the next generation and to enhance the quality of life of our descendants. But in the process of altering human nature, we would be abandoning the standard by which to judge the goodness or the wisdom of the particular aims. We would stand to lose the sense of what is and is not human.

The fear of a new eugenics is not, as is sometimes alleged, a concern born of some irrational fear of the future or the unknown.

---

* One thinks of certain forms of plastic surgery or recreational uses of euphoriant drugs, and the uses in athletics and schools of performance-enhancing drugs, such as anabolic steroids, erythropoietin, and Ritalin.

Neither is it born of hostility to technology or nostalgia for some premodern pseudo-golden age of superior naturalness. It is rather born of the rational recognition that once we move beyond therapy into efforts at enhancement, we are in uncharted waters without a map, without a compass, and without a clear destination that can tell us whether we are making improvements or the reverse. The time-honored and time-tested goods of human life, which we know to be good, would be put in jeopardy for the alleged and unknowable goods of a post-human future.

4. Troubled Family Relations

Cloning-to-produce-children could also prove damaging to family relations, despite the best of intentions. We do not assume that cloned children, once produced, would not be accepted, loved, or nurtured by their parents and relatives. On the contrary, we freely admit that, like any child, they might be welcomed into the cloning family. Nevertheless, the cloned child's place in the scheme of family relations might well be uncertain and confused. The usually clear designations of father and brother, mother and sister, would be confounded. A mother could give birth to her own genetic twin, and a father could be genetically virtually identical to his son. The cloned child's relation to his or her grandparents would span one and two generations at once. Every other family relation would be similarly confused. There is, of course, the valid counter-argument that holds that the "mother" could easily be defined as the person who gives birth to the child, regardless of the child's genetic origins, and for social purposes that may serve to eliminate some problems. But because of the special nature of cloning-to-produce-children, difficulties may be expected.

The crucial point is not the *absence* of the natural biological connections between parents and children. The crucial point is, on the contrary, the *presence* of a unique, one-sided, and replicative biological connection to only *one* progenitor. As a result, family relations involving cloning would differ from all existing family arrangements, including those formed through adoption or with the aid of IVF. A great many children, after all, are adopted, and

live happy lives in loving families, in the absence of any biological connections with their parents. Children conceived by artificial insemination using donor sperm and by various IVF techniques may have unusual relationships with their genetic parents, or no genetic relationships at all. But all of these existing arrangements attempt in important ways to emulate the model of the natural family (at least in its arrangement of the generations), while cloning runs contrary to that model.

What the exact effects of cloning-to-produce-children might be for families is highly speculative, to be sure, but it is still worth flagging certain troubling possibilities and risks. The fact that the cloned child bears a special tie to only one parent may complicate family dynamics. As the child developed, it could not help but be regarded as specially akin to only one of his or her parents. The sins or failings of the father (or mother), if reappearing in the cloned child, might be blamed on the progenitor, adding to the chances of domestic turmoil. The problems of being and rearing an adolescent could become complicated should the teenage clone of the mother "reappear" as the double of the woman the father once fell in love with. Risks of competition, rivalry, jealousy, and parental tension could become heightened.[*]

Even if the child were cloned from someone who is not a member of the family in which the child is raised, the fact would remain that he or she has been produced in the nearly precise genetic image of another and for some particular reason, with some particular design in mind. Should this become known to the child, as most likely it would, a desire to seek out connection to the "original" could complicate his or her relation to the rearing family, as would living consciously "under the *reason*" for this extra-familial choice of progenitor. Though many people make

---

[*] And there might be special complications in the event of divorce. Does the child rightfully or more naturally belong to the "genetic parent"? How would a single parent deal with a child who shares none of her genes but carries 100 percent of the genes of the person she chose to divorce? Whether such foreseeable complications would in fact emerge is, of course, an empirical question that cannot be answered in advance. But knowledge of the complexities of family life lead us not to want to dismiss them.

light of the importance of biological kinship (compared to the bonds formed through rearing and experienced family life), many adopted children and children conceived by artificial insemination or IVF using donor sperm show by their actions that they do not agree. They make great efforts to locate their "biological parents," even where paternity consists in nothing more than the donation of sperm. Where the progenitor is a genetic near-twin, surely the urge of the cloned child to connect with the unknown "parent" would be still greater.

For all these reasons, the cloning family differs from the "natural family" or the "adoptive family." By breaking through the natural boundaries between generations, cloning could strain the social ties between them.

5. Effects on Society

The hazards and costs of cloning-to-produce-children may not be confined to the direct participants. The rest of society may also be at risk. The impact of human cloning on society at large may be the least appreciated, but among the most important, factors to consider in contemplating the morality of this activity.

Cloning is a human activity affecting not only those who are cloned or those who are clones, but also the entire society that allows or supports such activity. For insofar as the society *accepts* cloning-to-produce-children, to that extent the society may be said to *engage* in it. A society that allows dehumanizing practices—especially when given an opportunity to try to prevent them—risks becoming an accomplice in those practices. (The same could be said of a society that allowed even a few of its members to practice incest or polygamy.) Thus the question before us is whether cloning-to-produce-children is an activity that we, *as a society*, should engage in. In addressing this question, we must reach well beyond the rights of individuals and the difficulties or benefits that cloned children or their families might encounter. We must consider what kind of a society we wish to be, and, in particular, what forms of bringing children into the world

we want to encourage and what sorts of relations between the generations we want to preserve.

Cloning-to-produce children could distort the way we raise and view children, by carrying to full expression many regrettable tendencies already present in our culture. We are already liable to regard children largely as vehicles for our own fulfillment and ambitions. The impulse to create "designer children" is present today—as temptation and social practice. The notion of life as a gift, mysterious and limited, is under siege. Cloning-to-produce-children would carry these tendencies and temptations to an extreme expression. It advances the notion that the child is but an object of our sovereign mastery.

A society that clones human beings thinks about human beings (and especially children) differently than does a society that refuses to do so. It could easily be argued that we have already in myriad ways begun to show signs of regarding our children as projects on which we may work our wills. Further, it could be argued that we have been so desensitized by our earlier steps in this direction that we do not recognize this tendency as a corruption. While some people contend that cloning-to-produce-children would not take us much further down a path we have already been traveling, we would emphasize that the precedent of treating children as projects cuts two ways in the moral argument. Instead of using this precedent to justify taking the next step of cloning, the next step might rather serve as a warning and a mirror in which we may discover reasons to reconsider what we are already doing. Precisely because the stakes are so high, precisely because the new biotechnologies touch not only our bodies and minds but also the very idea of our humanity, we should ask ourselves how we as a society want to approach questions of human dignity and flourishing.

D. Conclusion

Cloning-to-produce-children may represent a forerunner of what will be a growing number of capacities to intervene in and alter the human genetic endowment. No doubt, earlier human actions

have produced changes in the human gene pool: to take only one example, the use of insulin to treat diabetics who otherwise would have died before reproducing has increased the genes for diabetes in the population. But different responsibilities accrue when one sets out to make such changes prospectively, directly, and deliberately. To do so without regard for the likelihood of serious unintended and unanticipated consequences would be the height of hubris. Systems of great complexity do not respond well to blunt human intervention, and one can hardly think of a more complex system—both natural and social—than that which surrounds human reproduction and the human genome. Given the enormous importance of what is at stake, we believe that the so-called "precautionary principle" should be our guide in this arena. This principle would suggest that scientists, technologists, and, indeed, all of us should be modest in claiming to understand the many possible consequences of any profound alteration of human procreation, especially where there are not compelling reasons to proceed. Lacking such understanding, no one should take action so drastic as the cloning of a human child. In the absence of the necessary human wisdom, prudence calls upon us to set limits on efforts to control and remake the character of human procreation and human life.

It is not only a matter of prudence. Cloning-to-produce-children would also be an *injustice* to the cloned child—from the imposition of the chromosomes of someone else, to the intentional deprivation of biological parents, to all of the possible bodily and psychological harms that we have enumerated in this chapter. It is ultimately the claim that the cloned child would be seriously wronged—and not only harmed in body—that would justify government intervention. It is to this question—the public policy question of what the government should and can do to prevent such injustice—that we will turn in Chapter Seven. But, regarding the ethical assessment, Members of the Council are in unanimous agreement that cloning-to-produce-children is not

only unsafe but also morally unacceptable and ought not to be attempted.*

ENDNOTES

[1] National Bioethics Advisory Commission, *Cloning Human Beings* Bethesda, MD, 1997.

[2] National Academy of Sciences (NAS) *Scientific and Medical Aspects of Human Reproductive Cloning*, Washington, DC: National Academy Press, 2002. (Referred to in subsequent citations as NAS Report.)

[3] NAS Report, pp. 6-7.

[4] Lederberg, J. "Experimental Genetics and Human Evolution" *The American Naturalist*, September-October 1966.

[5] Supreme Court of the United States. *Eisenstadt v. Baird,* 405 US 438, 1972.

[6] Tribe, L. "On Not Banning Cloning for the Wrong Reasons" in Nussbaum, M., and C. R. Sunstein. *Clones and Clones: Facts and Fantasies about Human Cloning*. New York: Norton, 1998, p. 321.

[7] Nuremberg Report. *Trials of War Criminals before the Nuremberg Military Tribunals under Control Council Law No. 10, Vol. 2, pp. 181-182*. Washington, DC: Government Printing Office, 1949.

[8] Helsinki Declaration. 18th World Medical Association General Assembly *Ethical Principles for Medical Research Involving Human Subjects*, adopted in Helsinki, Finland, June 1964, and amended in October 1975, October 1983, September 1989, October 1996, and October 2000.

[9] Belmont Report. The National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research. *The Belmont Report: Ethical Principles and Guidelines for the Protection of Human Subjects of Research*. Bethesda, MD: Government Printing Office, 1978.

[10] See, for instance, Chapter Four of the present report, as well as Chapter 3 of the NAS Report.

---

* Not surprisingly, some of us feel more strongly than others about this conclusion. One or two of us might someday be willing to see cloning-to-produce-children occur in the rare defensible case, but then only if means were available to confine its use to such cases.

[11] These issues are discussed in the NAS Report (3-2) as well as in Wilmut, I., Roslin Institute, Scotland. "Application of animal cloning data to human cloning," paper presented at *Workshop: Scientific and Medical Aspects of Human Cloning,* National Academy of Sciences, Washington, DC, August 7, 2001; and Hill, J., Cornell University. "Placental defects in nuclear transfer (cloned) animals," paper presented at *Workshop: Scientific and Medical Aspects of Human Cloning,* National Academy of Sciences, Washington, DC August 7, 2001.

[12] See, for instance, Chapter 3 of the NAS Report, and Kolata, G. "In Cloning, Failure Far Exceeds Success" *New York Times,* December 11, 2001, p. D1.

[13] See, for instance, Rimington, M., et al. "Counseling patients undergoing ovarian stimulation about the risks of ovarian hyper-stimulation syndrome." *Human Reproduction,* 14: 2921-2922, 1999; and Wakeley, K., and E. Grendys. "Reproductive technologies and risk of ovarian cancer." *Current Opinion in Obstetrics and Gynecology*, 12: 43-47, 2000.

[14] These issues are discussed in greater detail in Chapter 3 of the NAS Report.

[15] Hill J.R., et al. "Clinical and pathologic features of cloned transgenic calves and fetuses (13 case studies)" *Theriogenology* 8: 1451-1465, 1999.

[16] NAS Report, p. 3-2.

[17] NAS Report, Figure 3.

[18] See for instance the NAS Report, Appendix B, tables 1, 3, and 4.