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Cloning is the process of creating a genetically identical copy of an organism. It has been done for some years with micro-organisms and plants; in recent years, it has also been successful with some species of animals – sheep, cattle, mice, and others. While these uses of cloning have their own ethical issues, they will not be discussed here, except as they also impact the question of human cloning. In addition, related questions such as cloning tissues or organs are not discussed at length here, though more can be found in discussions on stem cell research.

Cloning essentially is the use of scientific techniques to recreate artificially what happens naturally in the splitting of an embryo early in cell division to create identical twins. The difference is that while natural identical twins originate from the union of the same egg and sperm cell and are of identical genetic age, clones originate from the union of an adult cell nucleus and an enucleated egg cell, and are “twins” at least one generation apart in origin. (There is a further issue about the mitochondrial DNA in the egg cell, DNA that does not come from the donor nucleus, which means that clones are not *exactly* identical copies.)

Cloning has been discussed in science fiction literature and movies for a long time; however, it entered public consciousness most especially with the birth of Dolly, the sheep in 1997. She was the first successfully cloned mammal (although some researchers have questioned whether Dolly was a true clone or whether there were other unknown tissues involved in her reproduction; however, other clones have been created successfully since Dolly). Dolly was created through somatic cell nuclear transfer (SCNT). In SCNT, a single cell is removed from an organism and its nucleus containing the DNA is extracted from the cell. An ovum (egg cell) is also obtained, and its nucleus is also removed. The adult cell nucleus with its full complement of adult DNA is then transplanted into the ovum, which ideally develops into a complete organism. However, the clone does not have a mixture of DNA from a sperm cell and an egg cell, but the same DNA as the adult cell from which it received the nucleus. SCNT is only one type of cloning technique, but so far has been the most successful.

Cloning of human beings is advocated for two purposes, usually labeled “reproductive” and “therapeutic.” “Reproductive” cloning is fairly straightforward – cloning as an alternative to normal sexual procreation in order to create a child to be brought to birth and, presumably, raised in a family. Advocates of reproductive cloning see it as a way for otherwise infertile couples to have a child when other reproductive technologies are not successful; it will also

create a controlled set of chromosomes that could allow a cloned child to be a tissue donor for the person who is the source of the DNA. Some have suggested cloning as a way to eventually “replace” a person who is terminally ill. Less likely to be pursued are proposals to create a class of persons with a particular set of genetic traits that suit them for specific social tasks – not necessarily “subhuman automatons” who are a lower social class, but nonetheless programmed towards a certain role.

Therapeutic cloning involves the creation of a new human life, not for the purposes of procreation to bring a child to birth, but to create a genetically controlled embryo as a source for stem cells. Therapeutic cloning intends for the clone to be destroyed within the first days or at most weeks of its existence, and its cells used to benefit others.

Interestingly, advocates of reproductive cloning have spoken against therapeutic cloning as unethical, since it directly destroys a newly created life. And, advocates of therapeutic cloning have spoken against reproductive cloning as an aberration of human procreation. While cloning has been banned in most European nations and in other scientifically-advanced countries, the United States continues to wrestle with appropriate legislation. As of this writing, many legislators wish to ban reproductive cloning, but are more likely to favor therapeutic cloning for its potential biomedical benefits.

The release of the first successful map of the human genome in 2000 makes cloning far more likely as a biomedical tool. The idea is that the ability to identify and modify an individual’s genetic makeup will allow us to tailor-make medicines and therapies for that person, and perhaps enhance certain desirable traits. Once a genetically improved version of the human genome is developed, it seems to make sense to copy that version to benefit future generations.

Cloning presents a number of difficult ethical issues. They can only be briefly discussed in what follows.

**Safety:** Dolly was created only after 274 failed attempts. This great loss of life is unacceptable in the process of developing cloning techniques for humans. The problem may even be worse if some of the clones survive but with severe abnormalities. Further, evidence is mounting that the use of DNA of a more advanced age than the egg’s DNA leads to earlier aging and its consequences; Dolly has arthritis at half the age of a normal sheep. We simply do not know enough about the human genome or the long-term consequences to safely pursue cloning at

this point.

Human and Family Identity: some have questioned whether a clone would have a soul, be a normal individual, or have severe identity issues. As mentioned above, cloning essentially recreates artificially what happens naturally in the creation of identical twins. Twins each have their own soul, their own identity, and their own unique personality. Thus, there is no real concern that clones will be identical psychological or even physiological copies of one another – because human identity is not wholly determined by our genetics. Diet, education, relationships, culture, life experiences, and a host of other environmental factors heavily influence our sense of identity. The reduction of human identity to merely one's genetic complement is one of the most critical concerns about this whole area of genetic discoveries.

However, a clone's sense of identity may be affected by just such environmental factors. Will cloned humans be viewed as "products" or commodities, of lesser value than those born in the normal way? How society views clones, expectations of the clone that led to his or her birth, and the person's own view of his/her status as a "copy" of someone else are unpredictable psychosocial factors.

Cloning also complicates family relationships. An infertile couple may wish to have a child with one or the other spouse's DNA, but the ovum may come from another woman. Who is the "mother" of the cloned child? Is it ethical to create a cloned child as a source for organ and tissue transplantation or stem cells for treating another family member? What might be the impact on the natural bonding that takes place between parents and child (especially with the mother) if the child is created asexually? There is no established moral tradition or jurisprudence for specific guidance in such difficult questions.

At the same time, it must be stressed that, if cloning is successful, a cloned individual would possess the same human personhood, dignity, and rights as any other member of the human community, regardless of biological or technological origin.

Biodiversity: we know that the constant process of copying DNA in the trillions of cells in the human body is not without error. Many of these errors have no apparent effect on health or functioning; others are life-threatening or even fatal. However, some of the variations or mutations in a species can be helpful when environmental factors change. Resistance to bacteria, flexibility in adapting to biosphere changes, and gradual improvements across time in a species may all be compromised with cloning the same genotype.

Further, cloning is properly viewed as a part of the eugenics project prevalent in Europe and the U.S. in the earlier decades of the twentieth century. Eugenics seeks to create the perfect human race through the interventions of science, selective breeding, forced sterilization, immigration limits, and other methods. Margaret Sanger, the founder of Planned Parenthood, was an outspoken eugenicist, and that organization continues her legacy. The logic of eugenics became most tragically evident in the Nazi regime in the 1930s and 1940s with the mass exterminations of Jewish persons, homosexuals, clergy, the disabled, and other groups who were considered “lives not worth living” (“Lebens nicht lebenswert”). The project of modern cloning advocates, although motivated by very different reasons, is nonetheless related to eugenics, which has been amply demonstrated as discriminatory and unjust.

Human Sexuality: our culture is confused about the meaning and purpose of human sexuality in many ways. The separation of the unitive and procreative meanings of sexual intercourse introduced by contraceptive methods undermines the fully human significance of our sexual identity and the “nuptial meaning of the body,” as Pope John Paul II has put it. Cloning and other artificial reproductive technologies extend this separation by dividing the procreation of new life from the embrace of love and total self-giving that is sexual intimacy in the context of marriage. Cloning is in fact asexual reproduction. However, both ova and wombs must still be employed for cloning to succeed; this clearly removes these aspects of sexual procreation from their natural context and manipulates them scientifically. The clone is not accepted as a gift from God but a product of science, not the visible and living fruit of conjugal love between the spouses but the accomplishment of technicians.

For these reasons, the Catholic Church is opposed to cloning for reproductive, therapeutic, or experimental reasons. Any attempt to create life apart from sexual intercourse within marriage remains an affront to the plan of God the Creator. This teaching is expressed most fully by the Congregation of the Doctrine of the Faith in *Donum vitae* (March 10, 1987) and repeated by its update to *Donum Vitae*, entitled *Dignitas Personae* (September 8, 2008). It is also discussed by the Pontifical Academy for Life in *Reflections on Cloning* (September 30, 1997). This latter document states:

To enable biomedical science to maintain and strengthen its relationship with the true welfare of man and society, it is necessary to foster, as the Holy Father recalls in the Encyclical *Evangelium vitae*,  
a  
"contemplative outlook" on man himself and the world, with a vision of reality as God's creation and in a context of solidarity between science, the good of the person and of society.

“It is the outlook of those who see life in its deeper meaning, who grasp its utter gratuitousness, its beauty and its invitation to freedom and responsibility. It is the outlook of those who do not presume to take possession of reality but instead accept it as a gift, discovering in all things the reflection of the Creator and seeing in every person his living image” (*Evangelium vitae*, n. 83).

While no one of these arguments on its own may be convincing to our culture, the accumulation of them must give us pause. Cloning is an eminent example of what has been called “the technological imperative,” the idea that because something may be technologically possible, it ought to be done. The Church always measures technological progress not merely on grounds of scientific success or desirable outcomes, but by the impact technology has on the human person in community. Of any given intervention, the Church would ask: “does this foster the physical, psychological, relational, and spiritual well-being of the person as a member of the human community?” Cloning seems to fail this test, as discussed above. It is a line that we need not cross, and would do well not to cross. There is much to lose, and nothing to gain, by pursuing human cloning.