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Cloning and Its Ethical Queries

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Abstract:

The concept of cloning has broken the traditional concept of heredity including biological and cultural. Cultural heredity leads to cultural evolution, the prevailing mode of human adaptation. The human genetic endowment by genetic cloning of eminent individuals is not warranted. Genomes can be cloned; individuals cannot. In the future, therapeutic cloning will bring enhanced possibilities for organ transplantation, nerve cells and tissue healing, and other health benefits. Humans have symbolic language, elaborate social and political institutions, codes of law, literature and art, ethics, and religion; humans build roads and cities, travel by motorcars, ships, and airplanes, and communicate by means of telephones, computers, and televisions. Cloning is morally right for the cases of increasing food production, surviving of species, healing fatal injured patients, providing child to couple who are incapable to produce by sex and so on. But on the other hand, it also morally wrong in the cases of the springs lack genetic uniqueness, harmful clone of terrorist, miscreants, militants.

Introduction: The term "cloning" describes a number of different processes that can be used to produce genetically identical copies of a biological entity. The copied entity, which has the same genetic makeup as the original, is referred to as a clone. Recently scholars have cloned a wide range of biological materials, including genes, cells, tissues and even entire organisms, such as a sheep. In nature, some plants and single-celled organisms like bacteria produce genetically identical offspring through a process called asexual reproduction. In asexual reproduction, a new individual is generated from a copy of a single cell from the parent organism. Natural clones, also known as identical twins, occur in humans and other mammals. These twins are produced when a fertilized egg splits, creating two or more embryos that carry almost identical DNA. Identical twins have nearly the same genetic makeup as each other, but they are genetically different from their parent. There is also artificial cloning as well as natural cloning,

and three types of artificial cloning are there ---- gene cloning, reproductive cloning and therapeutic cloning. Gene cloning produces copies of genes or segments of DNA.

Reproductive cloning produces copies of whole animals. Therapeutic cloning produces embryonic stem cells for experiments aimed at creating tissues to replace injured or diseased tissues. Gene cloning, also known as DNA cloning, is a very different process from reproductive and therapeutic cloning. Reproductive and Therapeutic cloning have many of the same techniques, but are done for different purposes. In reproductive cloning, researchers remove a mature somatic cell from an animal that they wish to copy. They then transfer the DNA of the donor animal's somatic

cell into an egg cell that has had its own DNA-containing nucleus removed. Researchers can add the DNA from the somatic cell to the empty egg in two different ways. In the first method, they remove the DNA-containing nucleus of the somatic cell with a needle and inject it into the empty egg. In the second approach, they use an electrical current to fuse the entire somatic cell with the empty egg. In both processes, the egg is allowed to develop into an early-stage embryo in the test-tube and then is implanted into the womb of an adult female animal. Ultimately, the adult female gives birth to an animal that has the same genetic makeup as the animal that donated the somatic cell. This young animal is referred to as a clone. Reproductive cloning may require the use of a surrogate mother to allow development of the cloned embryo, as was the case for the most famous cloned organism, Dolly the sheep.

Kinds of heredity: There are two kinds of heredity--- the biological and the cultural. Biological inheritance in humans is very much like that in any other sexually reproducing organism; it is based on the transmission of genetic information from one generation to the next by means of the sex cells. But cultural inheritance is based on transmission of information by a teaching-learning process, which is in principle independent of biological parentage. Culture is transmitted by instruction and learning, by example and imitation, through books, newspapers, radio, television, and motion pictures, through works of art, and through any other means of communication. It is acquired by every person from parents, relatives, and neighbors and from the whole human environment. Acquired cultural traits may be beneficial but also toxic; for example, racial prejudice or religious bigotry. Biological heredity is transmitted from parents to their children, and only inherited traits can be transmitted to the children. Cultural heredity is acquired characters transmitted to the progeny. However, cultural heredity goes beyond Lamarckian heredity, because it is horizontal and oblique and not only vertical. Traits can be acquired from and transmitted to other members of the same generation, whether or not they are relatives, and also from and to all other individuals with whom a person has contact, whether they are from the same or from any previous or ensuing generation.

Animal Clone: Over the last 50 years, scientists have conducted cloning experiments in a wide range of animals using a variety of techniques. In 1979, researchers produced the first genetically identical mice by splitting mouse embryos in the test tube and then implanting the resulting embryos into the wombs of adult female mice. Shortly after that, researchers produced the first genetically identical cows, sheep and chickens by transferring the nucleus of a cell taken from an early embryo into an egg that had been emptied of its nucleus. It was not until 1996, however, that researchers succeeded in cloning the first mammal from a mature (somatic) cell taken from an adult animal. After 276 attempts, Scottish researchers finally produced Dolly, the lamb from the udder cell of a 6-year-old sheep. Two years later, researchers in Japan cloned eight calves from a single cow, but only four survived. Besides cattle and sheep, other mammals that have been cloned from somatic cells include: cat, deer, dog, horse, mule, ox, rabbit and rat. In addition, a rhesus monkey has been cloned by embryo splitting. Animal clones are not always identical. . Although clones share the same genetic material, the environment also plays a big role in how an organism turns out. The first cat to be cloned, named Cc, is a female calico cat that looks very different from her mother. The explanation for the difference is that the color and pattern of the coats of cats cannot be attributed exclusively genes.

Approach to human clone: In the second half of the 20th century, as dramatic advances were taking place in genetic knowledge, as well as in the genetic technology often referred to as "genetic engineering," some utopian proposals were advanced, at least as suggestions that should be explored and considered as possibilities, once the technologies had sufficiently progressed. Some proposals suggested that persons of great intellectual or artistic achievement or of great virtue be cloned. If this was accomplished in large numbers, the genetic constitution of mankind would, it was argued, considerably improve. Human cloning may refer to "therapeutic cloning," particularly the cloning of embryonic cells to obtain organs for transplantation or for treating injured nerve cells and other health purposes. Human cloning more typically refers to "reproductive cloning," the use of somatic cell nuclear transfer to obtain eggs that could develop into adult individuals. Human cloning has occasionally been suggested as a way to improve the genetic endowment of mankind, by cloning individuals of great achievement, for example, in sports, music, the arts, science, literature, politics, and the like, or of acknowledged virtue. These suggestions seemingly have never been taken seriously. However, some individuals have expressed a wish, however unrealistic, to be cloned, and some physicians have on occasion advertised that they were ready to carry out the cloning. The obstacles and drawbacks are many and insuperable, at least at the present state of knowledge. Biologists use the term cloning with variable meanings, although all uses imply obtaining copies more or less precise of a biological entity. Three common uses refer to cloning genes, cloning cells, and cloning individuals. Cloning an individual, particularly in the case of a multi cellular organism, such as a plant or an animal, is not strictly possible. The genes of an individual, the genome, can be cloned, but the individual itself cannot be cloned, as it will be made clear below. Cloning genes or, more generally, cloning DNA segments are routinely done in many genetics and pharmaceutical laboratories throughout the world. Technologies for cloning cells in the laboratory are seven decades old and are used for reproducing a particular type of cell, for example a skin or a liver cell, in order to investigate its characteristics. Individual human cloning occurs naturally in the case of identical twins, when two individuals develop from a single fertilized egg. These twins are called identical, precisely because they are genetically identical to each other. The sheep Dolly, cloned in July 1996, was the first mammal artificially cloned using an adult cell as the source of the genotype. Frogs and other amphibians were obtained by artificial cloning as early as 50 years. Despite several highly publicized claims, human cloning still appears to be fiction. There currently is no solid scientific evidence that anyone has cloned human embryos. In 1998, scientists in South Korea claimed to have successfully cloned a human embryo, but said the experiment was interrupted very early when the clone was just a group of four cells. In 2002, Clonaid, part of a religious group that believes humans were created by extraterrestrials, held a news conference to announce the birth of what it claimed to be the first cloned human, a girl named Eve. However, despite repeated requests by the research community and the news media, Clonaid never provided any evidence to confirm the existence of this clone or the other human clones it purportedly created. . Seeking to multiply great benefactors of humankind, such as persons of great intelligence or character, we might obtain the likes of Stalin, Hitler, or Bin Laden. As the Nobel Laureate geneticist George W. Beadle asserted many years ago: ***"Few of us would have advocated preferential multiplication of Hitler's genes. Yet who can say that in a different cultural context Hitler might not have been one of the truly great***

leaders of men or that Einstein might not have been a political villain". There is no reason whatsoever to expect that the genomes of individuals with excellent attributes would, when cloned, produce individuals similarly endowed with virtue or intelligence. Identical genomes yield, in different environments, individuals who may be quite different. Environments cannot be reproduced, particularly several decades apart, which would be the case when the genotype of the persons selected because of their eminent achievement might be cloned. Are there circumstances that would justify cloning a person, because he or she wants it? One might think of a couple unable to have children, or a man or woman who does not want to marry, or of two lesbian lovers who want to have a child with the genotype of one in an ovum of the other, or of other special cases that might come to mind. It must be, first, pointed out that the cloning technology has not yet been developed to an extent that would make possible to produce a healthy human individual by cloning. Second, and most important, the individual produced by cloning would be a very different person from the one whose genotype is cloned, as belabored above.

Ethical, social, and religious values will come into play when seeking to decide whether a person might be allowed to be cloned. Most people are likely to disapprove. Indeed, many countries have prohibited human cloning. In 2004, the issue of cloning was raised in several countries where legislatures were also considering whether research on embryonic stem cells should be supported or allowed. The Canadian Parliament on March 12, 2004 passed legislation permitting research with stem cells from embryos under specific conditions, but human cloning was banned, and the sale of sperm and payments to egg donors and surrogate mothers were prohibited. The French Parliament on July 9, 2004 adopted a new bioethics law that allows embryonic stem cell research but considers human cloning a "crime against the human species." Reproductive cloning experiments would be punishable by up to 20 y in prison. Japan's Cabinet Council for Science and Technology Policy voted on July 23, 2004 to adopt policy recommendations that would permit the limited cloning of human embryos for scientific research but not the cloning of individuals. On January 14, 2001, the British government amended the Human Fertilization and Embryology Act of 1990 by allowing embryo research on stem cells and allowing therapeutic cloning.

Cloned animal and its problem: Reproductive cloning may enable researchers to make copies of animals with the potential benefits for the fields of medicine and agriculture. For instance, the same Scottish researchers who cloned Dolly have cloned other sheep that have been genetically modified to produce milk that contains a human protein essential for blood clotting. The hope is that someday this protein can be purified from the milk and given to humans whose blood does not clot properly. Another possible use of cloned animals is for testing new drugs and treatment strategies. The great advantage of using cloned animals for drug testing is that they are all genetically identical, which means their responses to the drugs should be uniform rather than variable as seen in animals with different genetic make-ups. Cloning is still very expensive, it will likely take many years until food products from cloned animals actually appear in supermarkets. Another application is to create clones to build populations of endangered, or possibly even extinct, species of animals. In 2001, researchers produced the first clone of an endangered species: a type of Asian ox known as a guar; sadly, the baby guar, which had developed inside a surrogate cow mother, died just a few days after its birth. In 2003, another endangered

type of ox, called the Banteg, was successfully cloned. Soon after, three African wildcats were cloned using frozen embryos as a source of DNA. Although some experts think cloning can save many species that would otherwise disappear, others argue that cloning produces a population of genetically identical individuals that lack the genetic variability necessary for species survival. Some have expressed interest in having their deceased pets cloned in the hope of getting a similar animal to replace the dead one. But as shown by Cc the cloned cat, a clone may not turn out exactly like the original pet whose DNA was used to make the clone. In the case of reproductive cloning is a very inefficient technique and most cloned animal embryos cannot develop into healthy individuals. For instance, Dolly was the only clone to be born live out of a total of 277 cloned embryos. This very low efficiency, combined with safety concerns, presents a serious obstacle to the application of reproductive cloning. Bio-Scientists have observed some adverse health effects in sheep and other mammals that have been cloned. These include an increase in birth size and a variety of defects in vital organs, such as the liver, brain and heart. Other consequences include premature aging problems with the immune system. Another potential problem centers on the relative age of the cloned cell's chromosomes. As cells go through their normal rounds of division, the tips of the chromosomes, called telomeres, shrink. Over time, the telomeres become so short that the cell can no longer divide and, consequently, the cell dies. This is part of the natural aging process that seems to happen in all cell types. As a consequence, clones created from a cell taken from an adult might have chromosomes that are already shorter than normal, which may condemn the clones' cells to a shorter life span. Indeed, Dolly, who was cloned from the cell of a 6-year-old sheep, had chromosomes that were shorter than those of other sheep her age. Dolly died when she was six years old, about half the average sheep's 12-year lifespan.

Therapeutic cloning and its problems:

Therapeutic cloning involves creating a cloned embryo for the sole purpose of producing embryonic stem cells with the same DNA as the donor cell. These stem cells can be used in experiments aimed at understanding disease and developing new treatments for disease. Till now there is no evidence that human embryos have been produced for therapeutic cloning. It is expected to use embryonic stem cells, which have the unique ability to generate virtually all types of cells in an organism, to grow healthy tissues in the laboratory that can be used replace injured or diseased tissues. In addition, it may be possible to learn more about the molecular causes of disease by studying embryonic stem cell lines from cloned embryos derived from the cells of animals or humans with different diseases. Finally, differentiated tissues derived from ES cells are excellent tools to test new therapeutic drugs. It is worthwhile to explore the use of embryonic stem cells as a path for treating human diseases. However, some experts are concerned about the striking similarities between stem cells and cancer cells. Both cell types have the ability to proliferate indefinitely and some studies show that after 60 cycles of cell division, stem cells can accumulate mutations that could lead to cancer. Therefore, the relationship between stem cells and cancer cells needs to be more clearly understood if stem cells are to be used to treat human disease.

Advantages:

i) It helps infertile couples to bear children -- One big advantage of cloning is that it allows infertile couples to reproduce, and the child would be genetically modified to fit what the

parents want to appeal to other people. During the process, somatic cells are acquired from the male's sperm and are injected into the female's egg for fertilization. By the time the embryo has developed, it is then implanted to a surrogate mother, who will carry it for 9 months until birth. This means cloning can potentially ease fertility problems. What's more, the children produced will have the DNAs and qualities of both parents, instead of just one of them.

ii) It has great contribution to organ replacement --

Genetic cloning allows scientists to take small amounts of cells from a certain organ and use them to generate and harvest new organs that are entirely functioning. Considering the huge number of people on organ donation waiting lists, this is extremely beneficial.

iii) It allows for growing eminent individuals--

Historical and very influential people can be possibly re-created. Theoretically, someone like Martin Luther King Jr. or Albert Einstein can be brought back to life by cloning. This means we will be able to have such knowledgeable individuals to educate and help people in today's world.

iv) Cure for Diseases--

Starting with the same procedure as adult DNA cloning, therapeutic cloning allows a resultant embryo to grow for days, where the stem cells would then be extracted and encouraged to grow into human tissue or complete human organs that will be used for transplants or treatments of certain diseases. The end result would not be a human being, but rather a piece of nerve tissue, replacement organ or quantity of skin.

v) It does not need to involve making a whole new person---

It would be an easy way to solve the organ scarcity issue that currently exists. The process of cloning could also be used to repair or grow new cells to replace damaged or missing ones, which could treat illnesses and genetic disorders.

vi) Children can be born to same-gender couples----

Instead of using sperm or egg banks to create an embryo that could be brought to term, cloning would allow same-gender couples to have a child that was biologically their own. For women, a direct implantation of adult somatic cells wouldn't even require a male donor at all except for the initial fertilization process to create the embryo. For men, the same would be true regarding the egg requiring fertilization.

vii) Removes the grief of loss of child----

One of the greatest tragedies that occurs in life is the loss of a child anyhow. Cloning offers a process where parents could effectively balance their grief by creating another child. Although the new life would be different, it would also be similar, and that could temper some of the grief that is experienced.

viii) It can prevent extinction of species--------

As many organisms in the planet approach endangerment and extinction, cloning appears to be a possible solution to restore populations. By utilizing the genetic material of already dead organisms, cloning can even contribute to expanding the diversity of gene pools.

ix) Increases food production----

Another major advantage of cloning is that it can serve as a means to increase agricultural production, particularly livestock and fresh produce. By manipulating their biological processes, existing traits of interest are ensured with the absence of the genetic gamble and random arrangements in the genes during meiosis. During cloning the gene of interest is replicated faster than natural process.

Disadvantages:

i) Leads to uncertainty---- There is still a lot of repercussions and effects of cloning that remain unknown to date. After all, it is a new world of science that is still continually being discovered, and there is no convincing way to tell what the mental, social and medical consequences may be endured due to it. Also, the research and testing that are needed before embarking on something as insane as cloning humans still does not exist. Considering the problems that already exist with animal cloning, we can safely presume that the procedure will be a very large obstacle to begin with.

ii) Fear of new diseases----- One of the real possibilities of cloning is cell mutation, which is known to result in new and more aggressive genetic diseases to begin within humans, creating a lot of problems. In fact, many people believe that such an event will be the demise of civilization.

iii) Organ rejection----- As stated above, cloning can cause cell mutation, which is still highly possible even if the technique uses the cells of the recipient's organ. This can result to a substantial difference in the cell make-up between the original and replicated organ.

iv) Gene diversity---- The ability of humans to live greatly relies on the diversity of genes, which comes from parents who have different sets of genes. One big disadvantage of identical genes is that they will weaken our adaptations and power, which can make us subjected to certain diseases easily. Moreover, we should remember that the beauty of humanity lies in the differences among individuals, and cloning ruins this.

v) Inbreeding- problem------ One of the most unfavorable consequences of cloning is in-breeding, where everyone will be having the same genotypes, which can keep reproducing among themselves. This means this procedure would lead us to extinction. As what Richard Nicholson of the British Bulletin of Medical Ethics said, research on cloning may well be "sowing the seeds of our own destruction."

vi) Disruption of parenting and family life------ The basic concept of family is couples falling in love and determining to care for each other. Then, they may decide to have children whom they will love dearly. But with cloning, parents involved will tend to only value their children according to how much they look like themselves.

vii) Feeling of separation--- These days, there is already a bit of divide among people, whether it is due to race, language or social status—discrimination and prejudice certainly exist. Now, for cloned humans, they would feel as if they are not as "human" as other people who are not born out of cloning.

viii) Misapplication---- There is always a risk of cloning technology being abused, so scientists should do their best to keep the technology closely monitored. For instance, you can just imagine what a corrupt dictator could do with cloning. Truth be told, there will always be someone looking to use such technology for his own advantage, and many feel that the best way to prevent this scenario is not pursuing cloning at all.

ix) The poor cannot survive----- A society where genetic selection is possible would place a higher emphasis on the socioeconomic means of each person or household. Those who could afford cloning would essentially create their own class, while those who could not afford the process would likely be shunned or disregarded by the rest of society.

x) Hates to cloned people----- If a clone is an exact replica of the host, then embryos could be implanted with the sole purpose of helping with the health of the host instead of treating the clone with equal rights as a human being. Embryonic stem cells might be harvested from a clone. Clones might be used as automatic organ donors. They might be placed into forced labor. The levels of abuse that could occur with this type of technology are immense.

Ethical issues related to cloning:

Gene cloning is a carefully regulated technique that is largely accepted today and used routinely in many labs worldwide. However, both reproductive and therapeutic cloning raised important ethical issues, especially as related to the potential use of these techniques in humans. Reproductive cloning would present the potential of creating a human that is genetically identical to another person who has previously existed or who still exists. This may conflict with long-standing religious and societal values about human dignity, possibly infringing upon principles of individual freedom, identity and autonomy. Reproductive cloning could help sterile couples fulfill their dream of parenthood. Others see human cloning as a way to avoid passing on a harmful gene that runs in the family without having to undergo embryo screening or embryo selection. Therapeutic cloning, while offering the potential for treating humans suffering from disease or injury, would require the destruction of human embryos in the test tube. Consequently, opponents argue that using this technique to collect embryonic stem cells is wrong, regardless of whether such cells are used to benefit the injured people.

Savior of siblings: It is claimed that cloning is the savior of siblings.

"*Savior sibling*," means a child that is deliberately conceived so that she could provide a means to save an older sibling from illness or death. Cloning would ensure that the new child is an appropriate match for the existing ailing person, since they would be genetically identical. Permitting cloning, therefore, would allow for a more expedient means of creating a savior sibling, since the alternatives are more involved and more time consuming. But it is ethically wrong while it violates Kant's principle of respect for person.

Cloning would facilitate viewing the resulting children as objects of manufacture, rather than as individuals with value and dignity of their own. The prospect of creating a child, solely to meet the needs of another child and not for her own sake, reduces the created child to a mere

means to achieve the ends of the parents and the sick child. While it is admirable that the parents wish to save their existing child, it is not ethically permissible to create another child solely as an instrument to save the life of her sibling. Besides this, cloning violates Immanuel Kant's second principle formulation of the categorical imperative. Kant proscribes treating persons as a mere means, rather than as ends in themselves, maintaining that persons should "act in such a way that always at the same time as an end and never simply as a means". Creating a child for the sole purpose of saving another child violates the formula of humanity because the child is created specifically for this end.

This helpful research is used to create embryos for therapeutic cloning; there is no intent to implant them in order to create children. Rather, the intent is to use the cells of the embryo in order to further research that may ultimately lead to treatments or cures for certain afflictions. Hence it should be allowed. But it is also morally wrong. Because, the embryo is also a bearer of dignity, moral status and moral rights; so it is unethical to experiment on an embryo for the same reason it is unethical to experiment on any human being.

Open future----

According to some ethicists who oppose human cloning, a cloned child's identity and individuality will be compromised given that she will be "saddled with a genotype that has already lived". Because of the expectations that the cloned child will re-live the life of her genetic predecessor, the child would necessarily be deprived of her right to an open future. Because all children deserve to have a life and a future that is completely open to them in terms of its prospects, and because being the product of cloning would necessarily deprive the resulting child of these prospects, hence cloning is seriously immoral. In a sense, this objection maintains that a cloned child would either lack the free will to live her life according to her own desire and goals or that, at the very least; her free will would be severely restricted by her parents or the society that has certain expectations of her given her genetic lineage.

God's authority--- Another common concern is that cloning is morally wrong because it oversteps the boundaries of humans' role in scientific research and development. These boundaries are set by either God or nature. Any method of procreation that does not implement traditional modes of conception, i.e., not involving the union of sperm and ova, is guilty of one of these infractions.

In response of this argument it is claimed that this objection purports to know what God's will is in regards to technological advancements such as cloning. However, since key religious texts like The Bible, The Torah, or the Qu'ran make no mention of such advancements, it is presumably impossible to determine what God would have to say about them.

Conclusion: So, the developments of scientific research seem to go faster than the actual and real needs of humans, who are the ultimate recipients of such progress. Because of that, there is a pressing need to determine whether such practical applications are timely or are indeed necessary for human survival. To date, many people still believe that the process of cloning itself is not ethical. In fact, many countries have prohibited all research and actual cloning processes, making it. Nevertheless, the process of cloning is still up for further studies.

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