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Cloning: Ethical or Immoral

On July 5, 1996 a momentous event occurred which could change the path of mankind (Kolata, 1) Most people were not even aware that such an important occasion had arisen. The actual announcement of this historic event was not made public until February 24, 1997 (Pence, 1). One might wonder why if this was such an important time in the history of mankind, did it take nearly six months to inform the public? The answer is that the declaration would bring about much public consternation about the ethicity of the event. The occurrence was so unprecedented that it needed to be patented before the public was made aware of its occurrence (Kolata 1).

Dolly, the lamb was born on this very important day. The technique in which Dolly was conceived was the moral issue being pondered. Dolly was not conceived by the mingling of an egg and sperm. She was conceived in a scientific lab. Dolly was actually created from the genetic material of an udder cell of a six-year-old sheep. In other words, Dolly was a clone. And herein lies the ethical issue to be scrutinized.

What is cloning:? What is the history of cloning? What are the are the social and religious moral issues of cloning? Can society create regulations and guidelines, which

would prevent the misuse or exploitation of the science of cloning? These are the questions I hope to answer in this paper.

According to the National Bioethics Advisory Commission, cloning "refers to a precise genetic copy of a molecule, cell, plant, animal, or human being. In some of these contexts, cloning refers to established technologies that have been part of agricultural practice for a very long time and currently form an important part of the foundations of modern biological research" (NBAC, 29).

Cloning is achieved through the cell process of mitosis. It is considered asexual reproduction. In mitosis, which is also called clonal reproduction, cell division produces two daughter cells with identical chromosomal compliments. In the case of cloning, whether the nucleus of a cell is taken from the brain or a muscle, the clone will be identical to the donor. Cloning is different than cell differentiation, which occurs in sexual reproduction. This process is called meiosis. Meiosis generates sex cells. In the process of cell differentiation, cell division divides the chromosomes numbers by half. One of each pair of homologous chromosomes enters the sperm or egg. This is the process, which takes place in the natural form of conception. (Watson, 599)

There are many types of cloning. In molecular cloning strings of genes containing DNA are replicated in a host bacterium. Cellular cloning is the process in which copies of a cell are made. which ultimately results in a cell line. a group of copied cells. This process is very repeatable and the resulting cell lines can be grown indefinitely. Embryo twinning is the process in which a sexually developed embryo is divided into two identical halves. This process is an accepted method of cloning, which has been employed for many years in the livestock sector. The twinning process is not really what we would consider as today's term

of cloning since the process uses a sexually developed embryo. Somatic cell nuclear transfer (SCNT) is the process, which best describes what we currently refer to as cloning. SCNT is the process of implanting an adult human cell into an egg cell in which the nucleus has been removed (Pence, ix). This is the process, which was used to produce Dolly. This is also the process, which could ultimately produce a cloned human child.

Somatic cells are cells found in the body as opposed to sex cells, which are found in the ;peen or egg generating cells (Drlica, 234). The science of somatic nuclear transfer is based on the knowledge that any somatic cells found in muscle, skin or any other parts of an animal will all contain the same exact nuclei in their somatic cell. Because of this trait, every somatic cell contains all the genetic material needed to copy an organism. This is the reason cloning is possible. A cell could be used to start an embryo. The resulting embryo would be implanted into a surrogate mother and the resulting clone would be an identical replica of the original cell donor. (Davis, 594)

Thus far, cloning has been successfully attempted with animals. Animals are cloned in order to do research in the science of genetic manipulation. Genetic manipulation can be used in medical research for the treatment of Human diseases. Cloning is used in the field of agriculture. In these studies. animals are produced which are genetically identical. Cloning can also be used to quickly produce desirable animal stock.

In his testimony before the National Bioethics Advisory Commission, the Lutheran theologian, Gilbert Meilaender stated that "cloning entails the production, rather than the creation, of a child" (qtd. in Kolata, 7). With this view in mind let us explore exactly how the process of cloning evolved.

Cloning is not altogether an unnatural process. If you have ever noticed how ground cover replicates itself. you have seen how Mother Nature produces clones. A ground cover such as pachysandra will actually send out a runner, which will eventually be the start of a new plant. This runner is a form of a stem which will root itself causing the ground cover to creep with the birth of new plants which will cover the ground. These plants continue to replicate themselves ultimately covering more ground with the new vegetation.

If I took a cutting of a stem from the pachysandra and forced it to root itself into a new plant I would be cloning a new plant by the process of vegetative propagation. This process, well known to amateur gardeners works well because the end of the cutting will form a ball of nonspecialized cells. This ball of non-specialized cells is known as a callus. The callus will grow, divide and eventually form specialized cells, which results in the creation of a new plant. (Freudenrich, 1) These plants are clones of the original plant because genetically, the plants are exactly the same.

Horticulturists have been able to take this process of natural vegetative propagation and develop the procedure known as tissue culture propagation. Scientists have taken parts of specialized roots and have broken them into root cells. The root cells are grown in a nutrient rich culture. The specialized cells become unspecialized or dedifferentiated into calluses. Using plant hormones the calluses are stimulated into growing into new plants. (Freudnerich, 1) Horticulturists use this technique to produce very specialized plants.

Cloning is the production of an exact genetic replication of a primary cell, organism or animal. If we take this definition and apply it to the study of biology we would see that there are animals that are capable of cloning themselves. Frogs produce offspring, which are exact genetic duplicates of the egg laying females. This process is known as parthenogenesis

(Freudenich, 2). Humans have the capability of producing clones when the ovum splits into two separate eggs creating identical twins. The twins are exact genetic replicas of each other.

Scientists over the years have attempted to create clones of animals. The first attempts to clone a tadpole happened in 1952. Robert Briggs and Thomas J. King experimented in cloning frog embryos from frog skin cells. These first attempts in cloning never got past the embryo stage. The embryos would die before they got to the tadpole stage (Kolata, 29). The success of the procedure lies in the fact that Briggs and King were the first scientists to produce a clone by nuclear transfer. Rather than splitting an embryo, they had successfully transferred cell nuclei from frog blastula cells and transferred it into an enucleated frog egg. Their intention was to prove that cell nuclei had the ability to retain totipotency. In proving totipotency, the scientists needed to prove that cells had the ability to give rise to offshoot cells that could change in capacity and form to produce any of the kinds of cells of the organism. (Wilmut & Campbell, 76,77)

Progress in cloning frog cells was made in the 1970's. John Gurdon successfully cloned tadpoles by transplanting the nucleus from a specialized cell of one frog into the enucleated egg of another frog. The nucleus had been destroyed by ultra violet light. Through his experiments, Gurdon discovered that success in nuclear transfer was greater when using less specialized cells as opposed to using more mature, specialized cells. He was successful in producing clones, which grew into frogs when he used less specialized cells. When he attempted the same procedure with highly specialized cells found in adult frogs, he was never able to get past the tadpole stage of development. (Wilmut & Campbell, 77)

Experimentation continued on, and eventually the same procedure performed in cloning frogs was tried in the mammal world. This was an especially important endeavor

because humans are mammals, and if mammals could be cloned, it could be assumed that eventually man could be cloned. Because the gene structure of mice is very similar to the gene structure of humans. cloning was first attempted on mice with the hopes, in due time, of transferring the technique to cloning humans

The 1980's were a time mixed with emotions about the possibility of successfully cloning any mammal. Experiments were fraught with failure. Successes could not be replicated. Scientists began to wonder if cloning would ever become a reality. In 1995, Keith Campbell and Ian Wilmut discovered that by using quiescence cells, cells that have stopped dividing, they could successfully clone a lamb by using the somatic nuclear transfer method. (Love, 2)

Earlier in this discussion, it was noted that one of the reasons scientists set out to clone animals was for the purpose of producing animals which were genetically identical. If an animal could be genetically manipulated to carry genes of human diseases, or be genetically manipulated to produce antibodies against human diseases, it would be possible to do research on human diseases such as Parkinson's or Alzheimer's Disease. If the transgenic animal, an animal that carries a deliberately inserted foreign gene, could be cloned, then it would do away with the long arduous hours of repeating the gene manipulation. Transgenic animals would be replicated rather than being created time after time, after time.

It was with this knowledge that Keith Campbell and Ian Wilmut set out to produce lambs using the somatic gene transfer technique. At the time Roslin Institute and Pharmaceutical Proteins Limited were attempting to produce transgenic sheep with the genes of polycystic disease. Their intent was to attempt to clone a lamb from a transgenic sheep.

The problem with cloning sheep from embryo cells was that the procedure did not allow them to clone transgenic sheep. They needed to be able to use an adult cell from the transgenic lamb in order to be successful. Wilmut & Campbell set out to clone a lamb from adult cells so that in the future the lab would have the capacity to replicate transgenic animals.

Dolly was produced in 1996 from a mammary cell of an adult ewe. The mammary cell was taken from a culture of cells started from an adult ewe, which at the time of the procedure was long dead. The cultured cell was fused with an egg of another ewe in order to develop an embryo that was eventually transferred into the womb of a surrogate mother. This developing embryo grew into what we know as Dolly. (Wilmut & Campbell p. 3)

Although Dally was famous because she was cloned, the scientists who were involved in the cloning of Dolly were more intent on gaining success in genetic engineering. Their interests lie in the genetic transformation of human tissues and cells, animals and animal cells, which could be used for many purposes, such as agricultural, medical, pure scientific and conservational purposes. Their intent never was to clone humans (Wiltnut & Campbell, 5).

Roslin Institute and P.P.L., for which Campbell and Wilmut were employed, successfully cloned mammals from cultured adult cells. Dolly was evidence of this success. The Institute has since then, also successfully cloned mammals from cultured fetal cells and cultured embryo cells. The cloning procedures achieved the goals that Campbell and Wiltnut had set out to accomplish. These scientific experiments produced historic events. However, in 1997 the labs accomplished greater achievements. Polly was born. She was a lamb that was

both cloned and genetically transformed. Polly more closely exhibited the desired results that Roslin Labs and Pharmaceutical Proteins Limited Therapeutics were striving for.

We all watched the movie or read the book, Jurassic Park, with fascination. How awesome was the thought that it could be possible to bring back prehistoric animals. We found it fascinating to watch the development of an amusement park, which would in fact, house dinosaurs. However, as the movie progressed we found that achieving the scientific technique to clone the prehistoric animals should not have been the only concern of scientists. We watch with horror, as the scientist's dream becomes a nightmare. The scientists did not analyze how their discovery would fit into the real world. They neglected to take into account that the world of the prehistoric animal was very different from the world of today. They soon found out that even though they had the capabilities of cloning prehistoric animals from fossils, they did not have the capabilities of creating an environment conducive to the animals, yet safe to other inhabitants of the island. Jurassic Park is the science fiction story of how a scientific experience can go terribly wrong.

Many people have tile same concern about cloning. When the news that Dolly, the lamb had been born through the cloning process. tile immediate thought was that if lambs could be cloned, so could humans. Dolly was born, and with her birth came the birth of anxieties about the possibility of cloning humans. Science fiction now becomes reality, or soon to be reality. In the case of Jurassic Park, science fiction has definitely become reality. Zoologists have cloned animals from cultured cells of animals, which were in danger of becoming extinct, or had already become extinct. Despite scientific advances there are, and still continue to be many "what ifs" to be answered about human cloning.

Nancy Gibbs in her Times magazine article asks some interesting questions which could arise if cloning became a reality. "What if… a child dies and one parent wants to clone but the other doesn't. Who owns the rights to a dead person's DNA?" (Gibbs. 5). "What if... cloning becomes popular and supplants natural selection? Will that skew the course of human evolution'?" (Gibbs. 54). "What if... a clone develops unforeseen abnormalities? Could he sue his parents--or the cloners--for wrongful birth'?" (Gibbs, 56). The ethical issues of human cloning are an endless list of concerns.

Gregory Pence states that there are two ways to view the moral issues of human cloning. One view concerns the rightness of the act of producing a child by the process of human cloning. The second view concerns settling disputes about whether or not the act of human cloning is right. Objections to the rightness of human cloning can be broken down into two categories. One objection is based on the belief that human cloning is inherently wrong. An ethical concern is that human cloning is an act, which goes against natural reproduction. There is the concern that human cloning is the act of playing God. There are those ethicists that believe that only God can create life.

The second view is based on the rightness of human cloning. This is the consequentialist argument, which basically asks what are the consequences to humanity if human cloning is allowed. One needs to consider what the consequences of cloning would be to the child, to the family and to society as a whole. Safety is a concern for both the physical and psychological welfare of the child. Physically, there is a question of whether there would be genetic damage clone to the child in the process of cloning. Psychologically, there is a question of whether there would be an identity crisis for the child due the unusual circumstances of the child's conception. We will pursue these issues later in this discussion.

Mr. Pence feels that if the safety issue is eventually resolved, arguments about cloning will be based solely on the psychological safety of human cloning. (Pence, Flesh of my Flesh xii)

The issues about human cloning are not just about cloning a child. In discussing the entire scope of human cloning, the moral issue of cloning a child, while a complex issue, is a small part of the argument. There are many scientific techniques other than cloning a child, which fall under the category of human cloning. In the medical field, cloning of embryos, which could ultimately advance medical science, are of greater issue than the issue of cloning babies. Let's explore the benefits to mankind that human cloning of embryos could reap. In the field of stem cell transplants, rather than taking stem cells from discarded in-vitro fertilization embryos, cells from a patient could be cultured, changed into undifferentiated cells and used to manufacture an organ for transplantation. This method would diminish the concern about organ transplant rejection. Perhaps skin could be grown in a lab to be used as a graft on a burn victim. There is the theory that cloning could be used to introduce human genes into pigs. This would cause the organs of the pigs to be coated with human protein. The process could conceivably allow pig organs to be transplanted into human recipients without the fear of rejection. In the field of genetic engineering, one cell of an embryo could be removed to determine if the embryo is carrying a genetic disease. This process could eliminate the passing of genetic diseases from one generation to the next.

Michael West, president of Advanced Cell Technology, clearly states the scientist's fascination with cloning. "Cloning allows you to make a genetically identical copy of animal,
yes, but in the eyes of the biologist, the real miracle is seeing a skin cell being put back
into the egg cell, taking it back in time to when it was an undifferentiated cell, which then

can turn into any cell in the body" (Gibbs, 56). This concept alone could allow endless medical advances in the treatment of disease.

Presently, federal funding for research of the experimental use of embryos has been banned. This severely limits the amount of research, using human embryo cloning, which can be done in search of medical cures. Genetic engineers have theories about treating genetically related diseases, but cannot test their theories because of the federal funding ban. Embryo cloning could make research more efficient. By cloning identical embryos, some of the embryos could be used as controls for the experiment and some could be used for the actual experiment. Results would more quickly be achieved. Cancer research would advance, since cancer is the uncontrolled growth of cells. Cloning is the study of controlling cell development. Studies could be done to determine how to stop cancer cell growth. Cloning could reduce the number of animals used in scientific research, thereby diminishing the moral argument of using animals for the benefits of mankind. (Pence, Who's Afraid of Human Cloning 85-87)

The moral issue, which arises from the biotechnology of human cloning, is the respect for life issue. When does life begin? How many cells are required before the cell group is considered an embryo? If a cell is used to create an embryo in the laboratory, is that embryo the beginning of life? In arguing against using embryos for research, ethicists use the same slippery slope argument for embryo experimentation as they do for the abortion argument. If we allow scientists to kill embryos in the name of scientific advancement, then how soon will it be before we find ourselves experimenting with fetuses and ultimately babies in the name of science?

Gregory Pence, in his book Who's Afraid of Human Cloning?, uses Joseph Fletcher's cognitive criterion of personhood to determine that embryos are not persons. Mr. Fletcher says, "a person needs to he able to think, to remember one's life, and be capable of cognition" (qtd. in Pence 88). Obviously, embryos do not meet this criterion. There will be those, however, who counterpoint this statement by reminding us that destroying an embryo destroys the possibility of a person (88).

Mr. Pence believes that as time progresses, in the course of gestation, the embryo becomes more of a person. A five week old embryo would not be as much of a person as an eight month old fetus. Along with determining the personhood of the embryo, we must also weigh the benefits gained in curing diseases by allowing the experimental use of embryos. (89) On the other side of the coin, Leon Klass strongly opposes all forms of human cloning, stating, "And yet as a matter of policy and prudence, any opponent of the manufacture of cloned humans must, I think, in the end oppose also the creating of cloned human embryos" (qtd. in Pence. Who's Afraid of Cloning? 95). The Roman Catholic Church has similar views. The Church believes all embryos, no matter what their origins. or how early the stage of development is, are a form of life. It is the Church's concern that the respect for life will be lost in the experimental use of embryos. The Church is concerned that any new scientific technique takes many attempts before it is successful. Even when attempting to use cloning for the advancement of medicine, it is known that vast quantities of embryos would be destroyed. Will we ultimately lose our respect for life if we are killing embryos in the name of medical advancement? (Gibbs 56)

Just as proponents to human embryo cloning see many positive aspects to the procedure, proponents to human cloning see many positives to cloning children. Cloning

would be a benefit to infertile couples. Dan W. Brock, states that all humans have the right to reproductive freedom. As long as humans choose to use methods of reproductions, which do not cause significant harm to others, they should have the choice of pursuing cloning a child. He also believes that the couple should have the choice to decide what kind of child they will have, by using cloning. He states that while we all have the right to choose the method of reproduction, the right does not answer the moral issue of cloning. (145)

Cloning could help couples to conceive children without the fear of passing on a genetic trait. Presently, if a couple knows they carry a potentially dangerous genetic trait, which they fear their child could inherit they may choose to remain childless, adopt a child, or conceive a child through the use of a donor egg or sperm, in an attempt to do away with the risk of passing on a "bad" gene. Cloning would allow the couple to use one of the couple's cells to produce an offspring.

Futuristic supporters of cloning envision cloning to be a means of producing twins in an attempt to harvest organs for transplantation. We could question whether this vision would violate the clones right to life, since we would be using the clone to benefit the first twins life. Proponents also visualize using cloning to replace dead relatives. An argument against this goal is that clones do not replace people. A person is who he is, by merit of the combination of genes and the environment in which he lives. Cloning a person from genes of a dead person is not going to produce the exact same person from which he was cloned. The clone could help to alleviate the loss of a child, but wouldn't the couple's natural conception of another child produce the same results? The same argument pertains to duplicating talented individuals. Genes and environment make a person; cloning a talented musician would not necessarily result in the producing of another musician. (Brock, 146-151)

Proponents of cloning believe that cloning of humans could help advance scientific research. We must question what the end results of the experimentation would be. Would we be left with genetic mistakes? Would we be introducing unwanted genetic tendencies in an attempt to adjust gene strains? Would we be violating the rights of clones by experimenting on them without their consent, for the benefit of others? We would need to address the question of whether or not we could achieve the same scientific advancements by using methods other than cloning for experimental purposes. (Brock 151, 161)

Opponents of cloning question whether there would be psychological harm to the clone as a result of his unusual conception. Opponents state that cloning goes against the right to a unique identity. This argument could be countered by the previously mentioned fact that genes, as well as environment determine the personality of a person. It would be conceivable that a clone would be different from his twin. Opponents suggest that the clone would be psychologically stressed because he would feel that he needed to live in the footsteps of his twin Mr. Brock suggests that we would not know the answer to this dilemma because human cloning has not yet occurred. If this were an occurrence, Mr. Brock feels that human cloning would be unethical. (157-158)

Cloning is believed, by opponents, to lessen the worth of individuals and lower the level of respect for human life. They fear that we will begin to believe that people are replaceable. The issue of playing God again comes to issue. If we feel we have the power to produce a child, then that would prevent us from designing the perfect child? Uniqueness of the individual would be destroyed. With less respect for human life, we could look upon clones as subservient individuals. Clones could be used for government or business purposes

in unethical ways. Clones could be produced, merely to perform menial tasks. This action would violate the right to equal moral respect, (Brock 159-161)

Different religions have varying views about the morality of cloning, As previously stated, Catholics are adamantly opposed to any type of cloning. Protestants feel cloning goes against the notions of personhood. Cloning would cause rise to questions about the value of life. The procedure would go against what Protestants perceive as the image of God. However, some Protestant scholars, and Jewish and Islamic leaders have a more conservative view about cloning embryos, These conservative leaders agree that cloning could be a bonus to medical research. (NBAC 166-167)

In general, all religions have a concern about the sanctity of life issue. They believe that clones have to have the same rights as humans. The Catholic Church feels cloning goes against the natural law of procreation. The Church believes that just the use of the cloning procedure to produce human beings goes against human dignity (NBAC 175). More moderate religions feel that cloning a child could be considered morally acceptable, depending on the circumstances and conditions (NBAC 175). In the Jewish tradition, it may be considered morally acceptable to clone a child if there are no descendants to carry on the family line.

Religious views about the issue of cloning vary according to the traditions relevant to the religion. The Jewish tradition would approve of cloning to carry on the family gene line. because the Jewish religion looks upon infertility as a disease, Jews have the responsibility to provide healing, Islams could conceivably approve of cloning if the procedure does not change the family lineage, "Their concern about cloning is what effect would it have on natural kinship. They would not approve of using a donors egg or sperm because this

process would change the natural order of things, Without ancestry, there comes a lack of identity. (NBAC 173-174)

Disputes about the rightness of cloning will be settled by developing guidelines. regulations and restrictions for human cloning, When creating limits and regulations for cloning we must take into account individuals rights, John Stuart Mill, author of On Liberty, states that a society has the responsibility to promote goodness and discourage harm. This should be done through public policy while granting freedom to the individual in respect to their private life. Government should not have the right to meddle in one's private life. Similarly, private citizens do not have the right to impose their own personal beliefs on the public. Mr. Mill used his *harm principle* to delineate the line between public and private sectors. The harm principle states the adult actions, which are purely personal and cause no harm to the public, are considered private. The public should not control these actions. When other people are affected by the action, the action becomes a moral issue. Actions become a matter of public policy when society attempts to promote positive attitudes, while tolerating personal discord about the values. When we consider the issue of cloning in an attempt to create limitations on the procedure, we must do so in a way, which protects the public from harm, while protecting the rights of the private sector. (Pence Who's Afraid of Cloning?, 61-62)

When discussing rights for and against cloning, Mr. Brock feels that both the proponent and the opponent's rights to liberty can be violated. Proponents say that restrictions would violate fundamental moral rights. Opponents say that restrictions would violate the same fundamental moral rights. A more individualized right, which would be violated, is the right to procreate, (143, 143) We can see that if cloning were restricted, the

regulations would affect the right of a childless couple to conceive. If cloning were allowed, the moral values of those opposing the process would be violated.

When creating guidelines for cloning humans we do so in such a way that personal rights are not violated. In his paper, "Troubled Dawn for Genetic Engineering", Robert Sensheimer states that controlling cloning impedes on the absolute right of freedom of inquiry. However, he states that no right can be absolute. There must be limits, especially in the case of cloning. (611) Mr. Sensheimer further states that, "...rights are not found in nature. Rights are conferred within a human society and for each there is expected a corresponding responsibility." (610), Maturity is needed in determining limits,

When setting limitations for cloning, we must set limits, which will bring about the most good for all. We must protect the rights of humans, as well as the clones. On the issue of cloning of embryos we must consider which procedure will bring about the most good: restricting the procedure, or permitting scientists to continue on with their quest. These are difficult decisions to make.

Mr. Pence offers a compelling argument in regards to the right to life of an embryo. It is true that an embryo's right to life increases as the embryo develops (Pence, Who's Afraid of Human Cloning 89). If for this reason, embryonic research were allowed to continue, guidelines would need to be developed dictating at what age of the embryo experimentation must be prohibited. Determining the proper age to disallow experimentation could be an insurmountable task. How do we decide at what age an embryo has a right to life? Mr. Fletcher's cognitive criterion of personhood would not provide us an answer because the criterion states that a person is not a person until he has cognitive skills (Pence, 88). Using Mr. Fletcher's criteria we could assume that not even babies have a right to life because they

do not have the ability to remember, or the ability to think. There is also the question of whether an embryo has a right to life based on its potential for life.

If cloning human embryos were permitted, regulations governing what types of human embryonic experimentation would need to be considered. In determining the regulations, motives for the experimentation would need to be scrutinized. The motives would have to prove that the experimentation could ultimately bring about good, while causing little harm for mankind. We must be careful that ulterior motives do not determine the purpose of the procedure.

Rules regulating human cloning should be considered a separate entity, I believe that the question we need to answer is whether human cloning should be allowed. We are treading unknown waters. We don't know what harm the procedure can cause. We do know that harm came, in the form of genetic and physicals defects, to animals, which were cloned. When deciding whether or not to restrict human cloning we must be prepared to take on the responsibility for the harm, which could occur as a result of human cloning, We must decide whether the end truly justifies the means. We also need to determine if we are going down a path of failure. A recent Chicago Sun Times article questions whether human cloning is possible (Neergaard, 31). Perhaps scientists need to determine if there are safer ways to achieve their goals other than through the process of human cloning.

In C.K. William's story, "My Clone", Oedipus's clone commits suicide because he feels he can not live up to the vision of perfection that Oedipus had for him. Oedipus asks the memory of his clone:

> But what will be your legacy to us?
>
> Self-love. Self-loathing

> And what of us will you take with you?
>
> Loathing. Love. (337)

Before we set up regulations for human cloning, we must first examine our motives for wanting the procedure. Are we attempting to clone ourselves in the hope of creating a perfect world? The story of "`My Clone" tells us we must be prepared to accept the good with the bad. I believe the story is telling us to proceed with caution in moving on with and setting regulations for the science of human cloning,

Works Cited

Beauchamp, T, & Walters, L, Contemporary Issues in Bioethics California: Dickenson Publishing Co.. Inc., 1978.

Brock, Dan W. "Cloning Human Beings: An Assessment of the Ethical **ISSLICS** Pro and Con." Nussbaum and Sunstein 141-167,

Davis, B. "Contemporary Issues in Bioethics." Beauchamp & Walters 592-598.

Drlica. Karl. Understanding DNA and Gene Cloning: A Guide for the Curious. 2nd ed., U.S.A.: John Wiley & Sons, 1992.

Gibbs, Nancy. "Wanting a Clone," Time 19 February 2001: 47-55.

Freudenrich, C. "How Cloning Works.", n.d., retrieved 4 April 2003 http://science.howstuffworks.com/cloning.htm/prinatable

Kolata, Gina. The Road to Dolly and the Path Ahead: Clone, New York: William Morrow and Company, 1998

Love, Jamie. "The Cloning of Dolly." 27 November 1997: 1-3. http://science.howstuffworks.com/framed.htm?parent=cloning.htm&url=http://www.ri bbsrc.ac.uk/library/research/cloning/http://science.howstuffworks.com/index.htm

Neergaard, Lauran. "Is cloning humans impossible'?" Chicago Sun-Times 1 1 April 2003: 31.

National Bioethics Advisory Commission, "The Science and Application of Cloning." Nussbaum & Sunstein 29-40.

Nussbaum, Martha & Sunstein. Cass. Clones & Clones: Facts and Fantasies About Human Cloning, New York: V.W. Norton & Co., 1998.

Pence, Gregory, Who's Afraid of Human Cloning? Maryland: Rowan & Littlefield Publishers, Inc. 1998.

Pence, Gregory. Flesh of My Flesh: The Ethics of Cloning Humans: A Reader, Maryland: Rowan & Littlefield Publishers, 1998.

Sensheimer, Robert. "Troubled Dawn for Genetic Engineering," Beauchamp & Walters 607-612.

Watson. J. "The Future of Asexual Reproduction." Beauchamp & Walters 599-606.

Williams, C.K. "My Clone." Nussbaum & Sunstein 332-337.

Wilmut, I., Campbell, K., Tudge, C. The Second Generation: Dolly and the Age of Biological Control. New York: Farrar Straus & Giroux, 2000.