Cloning inhabit the world. today, the only

Cloning The first thing that must be cleared up is what is cloning, and what is a clone. A clone is an organism derived asexually from a single individual by cuttings, bulbs, tubers, fission, or parthenogenesis reproduction (“ Cloning”, 1997). Pathogenesis reproduction is the development of an organism from an unfertilized ovum, seed or spore (“ Pathogenesis”, 1997).

So cloning, biologically speaking, is any process in which production of a clone is successful. Therefore, the biological term cloning is the production of a genetically identical duplicate of an organism. However, people can use the word cloning to intend other meanings. For instance, we generalize many older and new techniques as cloning. This is not a good practice because these techniques are different and impose unique concerns and issues. In the world of scientific technology, cloning is the artificial production of organisms with the same genetic material.

Scientists actually call the transferring of a nucleus from the cell of one organism to an enucleated egg cell, nuclear transfer (Wilmut 811). This will produce an organism that has the exact genetic material as that of the donor cell. Scientists are using current techniques exceedingly more, and with a variety of species.

Astonishingly, more clones are present in the world than one would think. In nature, and even in the lives of humans, clones are present. As stated earlier, a clone is an organism that has the same genetic information as another organism. From this we can say that cloning occurs with all plants, some insects, algae, unicellular organisms that conduct mitosis or binary fission, and occasionally by all multi-cellular organisms, including humans.

Monozygotic twins, or identical twins, are clones of each other. They have the same exact genetic information due to the division of an embryo early in development, which produces two identical embryos.

About eight million identical twins are alive in the world; thus, already eight million human clones inhabit the world. Today, the only cloning research is occurring in scientific model organisms. These are organisms that research scientists from around the globe have collected abundant amounts of data.

All this data is necessary so that advancements in research can continue more efficiently. The most common scientific models are E. coli, mice, fruit flies, and frogs. The first organisms that were cloned using nuclear transfer were frogs. This is because they have large egg cells and scientists can obtain up to two thousand of them from one ovulation. (McKinnel 79) Successful cloning has occurred with livestock. The drive toward success is not because livestock like cows and sheep are model organisms.

Instead, the farming industry has made and continues to make a big effort toward finding a way to implement the technique of nuclear transfer for livestock. Research in cloning is also occurring in primates. The reason for studying primates is the similarities with humans. This leads us to the most talked about aspects of cloning, the use of the techniques with human cells and eggs. Cloning of humans in a biological sense already has and is occurring.

Scientists are researching by splitting embryos to execute experiments to find data relating to cell differentiation, the use of stem cells, and genetic screening. Amazingly, genetic screening is occurring in Britain quite often.

Fertility clinics aim this service toward couples where the mother or father has a genetic disorder. A fertility clinic will clone an embryo, and then test it for genetic disorders.

If the embryo tests negative for genetic disorders, then the fertility clinic implants a clone of that embryo. This should guarantee that the child would not have any genetic disorders. (Benoit 2) Amazingly, the first attempts at artificial cloning were as early as the beginning of this century. Adolph Eduard Driesch allowed the eggs of a sea urchin develop into the two-blastomere stage. Then he separated it by shaking it in a flask and allowing them to grow. The cells developed into dwarf sea urchins.

Driesch could not explain his experiments and gave up embryology for philosophy (McKinnel 19). During the late seventies and early eighties, there were few scientists still studying cloning. Many had predicted that it was impossible to clone embryonic mammal cells. Few continued with research. Many gave up and went into other fields.

However, some persisted and were rewarded for their efforts. In 1984, Dr. Steene Willadsen announced that he had successfully transferred nuclei from embryos of sheep to produce clones (Kolata 1). He also was successful with cows and even monkeys.

He advanced his methods, and began cloning embryos that were in the 64-128 cell-stage. This suggested that perhaps nuclear transfer was possible with differentiated cells. More exciting was when Dr. Neal First produced cows by nuclear transfer from more developed embryos in 1994 (Kolata 3). Dr.

First produced four calves. Two years later, Dr. Ian Wilmut and Dr. Keith Campbell, of the Roslin Institute in Edinburgh, Scotland, produced for the world Megan and Morag, the first cloned sheep from embryo cells. Their new technique involved the starving of the donor embryo. This would put the cell in the right moment in the cell cycle, thus allowing the genetic material to integrate more successfully with the egg cell. This was the integral step of nuclear transfer. Dr.

First had executed the same step, but a laboratory staff member did it accidentally, and First did not realize the significance of his staff member’s blooper (Kolata 3). Dr. Wilmut and Dr. Campbell became world famous.

Their fame was not finished yet however. On July 5 at 4: 00 P. M. lamb number 6LL3 (Campbell 812), or Dolly, was born in a shed down the road from the Institute. She weighed in at 14 pounds and was healthy. Scientists accomplished this by using frozen mammary cells taken from a six-year-old pregnant ewe and fusing them with an enucleated egg.

The trick to fusing the cells is giving a small electric current to the petri dish on which the egg cell is. This stimulates the egg much like a sperm would, and usually takes the genetic material from the cell and becomes a zygote. They let this zygote grow into an embryo, and then transplanted the embryo in a recipient ewe, acting as a surrogate mother. This procedure occurred late in January of 1996. This was the day of fusion date for Dolly, which is the natural equivalent to a conception date.

An interesting note is that three different sheep were involved in producing Dolly, versus the usual two or one (in-vitro fertilization). Furthermore, the

Roslin scientists used three different breeds for each sheep to prove that the experiment was a success. (Kolata 3) The reporter who described Wilmut as " Dolly's laboratory father," could have very well shined a light on a modern day Frankenstein. Mary Shelley's Frankenstein was also his creature's father and god; the creature told him, " I ought to be thy Adam." As in the case of Dolly, the " spark of life" was infused into the creature by an electric current. Shelley's great novel explores virtually all the noncommercial elements of today's debate of whether to allow human cloning. The naming of the world's first cloned mammal has great significance. The sole survivor of 277 cloned embryos, the clone could have been named after its sequence in that group, C-137, but this would only have given the sheep another similarity to Frankenstein.

Instead, the first cloned mammal was given a name to suggest the sheep's uniqueness as an individual rather than a number. Victor Frankenstein never named his creature; this was his way of disregarding his duties as a parent. The creature evolved into a monster when he was rejected not only by his creator, but also by society in general. Naming the world's first mammal clone Dolly was done to remove all possibilities of similarity between her and the Frankenstein myth, by making her seem like a doll and by accepting parental responsibility for her.

After Dolly came other sheep, cows and even rhesus monkeys cloned using similar techniques, but with slight variations. These cloned animals came from Roslin and many universities from across America. They even produced clones, which had genes that would produce certain proteins. For instance, at Roslin, scientists are trying to produce sheep that produce milk with

beneficial proteins for Cystic Fibrosis patients.(Kolata 24) The goals and purposes for researching cloning range from making copies of those that have deceased to better engineering the offspring in humans and animals. Cloning could also directly offer a means of curing diseases or a technique that could extend means to acquiring new data for embryology and development of organisms as a whole. Scientists foresee the cloning of pigs to produce organs that humans will not reject (Wills 22).

Also, as mentioned earlier, livestock can produce biological proteins helping people who have diseases including diabetes, Parkinson’s, and Cystic Fibrosis (Kolata 2). Cloning also provides better research capabilities for finding cures to many diseases. There are also possibilities that nuclear transfer could provide benefits to those who would like children.

For instance, couples that are infertile, or have genetic disorders, could use cloning to produce a child. Equally important, women who are single could have a child using cloning instead of in-vitro fertilization. Nuclear transfer could also provide children who need organ transplants to have a clone born to donate organs. Cloning could also provide a copy of a child for a couple whose child had died.

Cloning does offer some negative affects it could have to life. The biggest problem with asexual reproduction is that genetic diversity becomes limited. If a population of organisms has the same genetic information, then the disease would wipe out the population. This is because not one organism has an advantage of fighting the disease over the other.

The technique of nuclear transfer is also early in its developmental stages. Thus, errors are occurring when scientists carry out the procedure. For instance, it took 277 tries to produce Dolly, and Roslin scientists produced many lambs with abnormalities (Wilmut 811). This is the main reason science is holding out on cloning humans. I also believe we should not attempt nuclear transfer to produce an adult human until the technique is perfected. Other arguments for cloning include if we are taking nature into our own hands by cloning. Religious organizations consider nuclear transfer to cause men to be reproductively obsolete (Post 19).

Religious groups claim that cloning defies the rule or their belief that humans have souls. They also consider cloning unnatural, and say we are taking the work of God into our own hands. People question when we will draw the line for getting involved in natural events (Bruce 1). There is also a debate as to the moral rights of clones.

Some say this will occur because there is no birth of newness (Post 19). We would not receive clones with such excitement as a child of a couple that conceived naturally. If natural reproduction were to occur, genetic variation would occur. They say cloning would deprive someone to have any perception of uniqueness. They argue that identical twins are not unique from each other. However, they are new in genetic variation and unique from anything that came before them. People also wonder what mental and emotional problems would result if a clone were to find out that he or she was cloned. So anyone who argues that cloning disregards the laws of God and the souls of humans, they should reconsider their views.

Cloning does not artificially produce copies of adult humans. Nuclear transfer is the artificial making of an embryo that will develop into an identical twin. No machine that can produce carbon-copy humans when performing nuclear transfer is involved.

At this point, I believe we should not use cloning. However, if we are to venture into cloning we must make many precautions. I think the best way to do this is to research the consequences.

Yet, I do not believe cloning of animals is acceptable. Thus, I do not think we should conduct cloning experiment on animals. In summary, cloning is ethical, unless there is lack of respect for the lives of animals and humans, and for the ongoing inhabitation of life on earth.

Bibliography Works Cited Kluger, Jeffery. “ Will we Follow the Sheep?” Time Magazine. March 10, 1997 Vol. 149 No.

10 “ The Cloning Controversy.” Online Available http://www. sican. com/explorations.

September 23, 1998. “ Ethics on Cloning: The issue at hand.” Online Available http://www.

time. com/cloning. September 24, 1998.

National Bioethics Advisory Commission. “ Cloning Human Beings.” Online Available http://bioethics. gov/pubs. html.

September 24, 1998. Price, Joyce. “ Before There was Dolly, There Were Disasters: Scientists failed to disclose abnormalities.” The Washington Times.

March 11, 1997. Words/ Pages : 2, 159 / 24