

Paper Title: Human Cloning: Bioethical & Theological Perspectives

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Abstract:

The term clone means identical copies of something. Therefore, to clone literally means to make replicas of any object. In genetics, the term ‘cloning’ has several meanings – the creation of a colony of identical cells by the division of a single cell or the creation of an entire organism from a somatic cell. The success of the creation of Dolly, the cloned sheep, in 1997 at the Roslin Institute has given rise to the possibility of human cloning. There have been several reports of cloning human embryo across the world. In animal cloning, the nucleus of the haploid cell-ova is replaced by the nucleus of the diploid cell. It involves transplantation of a nucleus from the body cells or embryonic cells into an enucleated unfertilized egg in the lab, thereby bypassing the usual process of fertilization of egg by sperm. Scientist in the field of cloning human embryos think that reproductive cloning is not difficult today. If cloned embryos are transferred into the uterus of a woman as in the case of IVF, then they may grow into human beings (reproductive cloning).

Scientists from different parts of the world claimed that they had succeeded in cloning human embryos with the intention of developing embryonic stem cells from them (therapeutic cloning). Stem cells are totipotent cells found inside embryos during the first two weeks of their development. They have the potential to develop into any kind of cell in the human body. After two weeks, stem cells differentiate into specialized tissues. Tissues created from stem cells could be used to treat many diseases such as diabetes, Parkinson’s disease and other inborn errors of metabolism. Stem cells could also be used to generate organs such as heart, kidney or liver, which can subsequently be used, for transplantations into patients with injured or defective organs. So human cloning is an issue of universal importance and is perhaps the greatest ethical challenge of the new millennium. Among the questions which arise before trying human cloning are: will cloning, even if it provides certain short-term remedies or advantages, actually improve the overall quality of human life? What are the bioethical issues relating to the person whose cells are being cloned? What are the theological perspectives when human beings bypass the natural method of sexual reproduction by cloning?

With regard to conducting cloning experiments on humans, it is to be observed that cloning causes disrespect towards the individuality of humans and undermines the great values of showing deep respect for human life from the zygotic stage onwards. It shatters the value of family life, which is founded on the warmth of loving relationship between parents and children. Human cloning seems to challenge the Christian teaching that the procreation of a new human being should be inseparably linked with marital love as the

physical result and embodiment of that interpersonal union. The church upholds the institutions of marriage and the family as morally indispensable in society – two institutions that are best for society.

Author Biography:

Joselet Mathew is a biologist, at present working as a senior faculty in the Department of Zoology, Nirmalagiri College/Kannur University, Kerala, India. Mathew earned a M.Sc. in Zoology with a specialization in environmental biology from St. Joseph's College, Calicut University with high first class honors in 1984. He obtained Ph.D. in aquaculture from Cochin University of Science and Technology with an ICAR / UNDP / FAO Senior research fellowship in 1991. He worked as Research Associate in the Department of Ocean Development for one year. Mathew has 17 years of teaching experience in undergraduate and postgraduate levels, and as an examiner for B.Sc. degree examinations in Kannur University. He has attended many national seminars of scientific and religious interest and presented papers. He is a member of AIACHE (All India Association for Christian Higher education) and of the marine Biological Association of India; a trained H.R.D Trainer; and an IMG (Institute of Management in Government) recognized resource person in personality development, value education, leadership training, career guidance, and scientific programs. His other official responsibilities include: Secretary, Pastoral Council, Archdiocese of Thalassery; Director board member Thalassery Social Service Society; and member of Centre for Religion and Science (CRS) functioning under the auspices of Institute for Research in Social Sciences and Humanities. (IRISH) Nirmalagiri College, Nirmalagiri, a program of the Metanexus Local Societies Initiative. He has participated in the following National Seminars Organized by CRS – 'Modern Human Reproductive Technology its bio-ethical dimensions' on 18.12.2004 and 'Challenges to life in the New Millennium-Bioethical Perspectives' on 28-30 October 2005.

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Paper Text:

INTRODUCTION

The term clone means identical copies of anything. Therefore cloning literally means making replicas of any object. In other words clone cannot be considered as an offspring, but simply the copy of a given individual. Thus cloning is a biotechnique for copying individuals by manipulations at cellular level. Basically there two kinds of cloning, gene cloning at molecular level and cloning of organisms. Gene cloning is done in three stages- the targeted gene in a cell is first isolated, then the isolated gene (biochemically a fragment of DNA) is introduced in different living organisms, and lastly, it is ensured that the recipient accepts the donor gene and inherits its properties.

While cloning of organisms is of slightly different kind, as we know the cell of any animal is diploid in character, and bears characters of both male and female individuals. In organisms cloning, the nucleus of the haploid cell- ova is replaced by the diploid cell.

This is then made to undergo the normal process of growth within the mother's uterus. Thus mother delivers a clone of itself at the end of pregnancy. Thus organism cloning generally involves transplantation of nucleus from the body cells or embryonic cells into an enucleated (egg cell from which the nucleus had been removed) unfertilized egg in the lab, thereby bypassing the usual process of fertilization of egg by sperm.

HISTORY OF CLONING:

In 1955, Robert Briggs and Tom King (American embryologists) for the first time carried out nuclear transplantation experiments on embryonic cells of frog. In 1960 J. B. Gurdon (an embryologist from Oxford University) transplanted nuclei from embryonic cells into zygotes whose nuclei were killed with UV radiations and this developed into tadpoles. He showed the possibility of using nuclei from the embryos to grow generations of similar embryos. In 1970 Illmense developed the technique of in vitro fertilization and embryonic culture. In 1984, Mc Grath and Solter, carried out the work of nuclear transplant in mouse. Some mice born, but none live to be adults. In 1986, Steen Willandsen (UK) split fertilized sheep egg into two portions (one with nucleus and one without nucleus). He fused cells from 8-16 cell stage of embryo with egg without nucleus. Zygote was developed. Thus embryos were obtained with identical genetic make up. These when implanted in surrogate sheep, gave birth to identical lambs. In 1988, Neal First performed similar fusion between cells from cattle embryos and enucleated cattle eggs. In 1993, Hall and Stillman, in experiment on man they artificially split an embryo into identical twins. These were the first artificially twinned human embryos and turned out to be abnormal.

Above efforts showed that embryos could be easily cloned. However, genetic make up of clones is not predictable. In 1996, February Nuclear transplant from udder cell to egg. Dolly was born normal, Ian Wilmut's success score on this point over others. In 1997, March Don Wolf and others made nuclear transplantation from embryo to egg in monkeys and normal monkeys were born.

CLONING OF DOLLY SHEEP:

The birth of Dolly, a clone of an adult sheep was a turning point in the realm of biotechnology. In 1996, Dr. Ian Wilmut and his team of researchers at Roslin institute in Edinburg (Scotland) took udder cells from a 6 year old female sheep- a Fin Dorset Ewe, and placed it in a special solution that controlled its division or cell cycle. The cell was deprived of certain nutrients. At the same time, an unfertilized egg was obtained from another adult sheep. Its nucleus was carefully removed leaving the cytoplasm intact. The nucleus of udder cell was taken out and transformed into the enucleated egg. The actual fusion was encouraged by a small electric shock, and cells were then allowed to grow and divide in the test tube. Subsequently the transplanted nucleus became functional according to the new surroundings (egg cytoplasm) in which it had been artificially placed. This viable combination underwent cleavage like that of a normal zygote. The resulting embryo was then transplanted into the uterus of the third adult sheep (surrogate mother) for its further development. Subsequently, a normal healthy little lamb- Dolly was born in February 1996. The new born sheep was genetically similar to the 'clone mother' from which nuclear DNA was taken for transplantation. However, it does not have any genetic similarity with the sheep from which the egg was taken or the 'surrogate

mother', because they did not contribute any nuclear DNA in the process. Another unique feature of Wilmut's experiment is that a carbon copy of the adult sheep was produced without involvement of the male genetic material, indicating thereby that sperms are not necessary for the pregnancy. The natural reproduction process can thus be short circuited by the cloning technique.

Till that time it was believed that a mammal could not be reproduced asexually from an adult animal. Dolly was the first fully developed mammal to be born using genetic material taken from a mature animal through the technique of 'Somatic Cell Nuclear Transfer' or nuclear replacement. In contrast with clones produced through artificial twinning of embryos, Dolly contained the genetic material of only one parent. Her creation marked the apparent ability to replace sexual procreation with asexual replication. Dolly was a living proof that an adult cell can revert to embryonic stage and produce a fully new being. The scientists of Roslin institute engaged in 277 such attempts and they succeeded in producing 29 embryos. Those embryos were transferred to the uteri of the surrogate mothers. Only 13 of the surrogate mothers became pregnant and just one gave birth to a baby, which was genetically identical with the original donor. The rest of the embryos perished in the womb. The researchers had spent \$.750, 000 on Dolly.

In 1998, Japanese scientists reported cloning eight copies of a single cow, with a far higher success rate than Dolly's creation. This is an indication that somatic cell Nuclear Transfer might be as efficacious for animal husbandry as invitro fertilization. In 1998, February researchers at the University of Massachusetts announced the birth of two healthy calves created by combing cloning techniques with genetic engineering. The calves named Charlie and George were born at a ranch in Texas following four years of research by James Robl and Steven Stice, of the Advanced Cell Technology (ACT) institute. The male calves are the first to be produced from genetically altered somatic (body) cells. The animals are genetically identical to one another and were created through a combination of cloning and genetic engineering (Transgenics) developed by Robl and Stice. The scientists have developed a reliable way to introduce new traits into live stock cells and produce an unlimited number of exact copies –clones. The new born cloned transgenic calves have a specific gene which serves as a marker to confirm that they are the products of genetic engineering. The calves are notable because they lead the way to the production of similar animals that can produce very large quantities of therapeutic human proteins, in their milk. These portions can either be extracted and purified and taken in the form of a pill or injection. This new field, a combination of pharmaceuticals and farming is called 'pharming'.

POSSIBLE BENEFITS OF SUCCESSFUL CLONING:

This experiment is revolutionary as the discovery of atomic energy. Basically these experiments are aimed towards getting better animals having desirable traits and for producing ample and less costly pharmaceutical protein in milk. This may be also useful for analysis and develop therapy for genetic disorders. This success may also create the possibility of producing human organs which can be implanted to a person and will serve like spare parts in case of old age or accidents. The cloning technique may be useful even for check on cancer or to produce insulin by introduction of necessary genes in an individual tissue. The same tool can also be used for cloning species of animals which are otherwise going to be extinct.

In the experiment of Dolly, one more revolutionary achievement has been made which is by and large neglected. Scientists have succeeded in reversing the biological clock. During the embryonic development, as the growth occurs some cells become specialized, some cells differentiate. This gives rise to various organs. Further, the extent to which these organs will grow, when they will become functional is all decided by the effects of hormones which themselves are produced at different time of growth by certain genes. All this is as if a biological clock works to decide what development has to occur at what time. Thus silencing of genes or activating genes to express is at the base of this biological clock. In this experiment of Dolly, the cells used for supply of genes were from mammary glands; where only genes specific for expression of function of mammary gland are active and all other genes are silent. But Dr. Wilmut succeeded in converting these specialized mammary gland cells into cells with reproductive capacity, thus awakening the silent genes or say reversing the biological clock. The practical advantage of this fact is that silent cells of brain in Parkinson's diseases or blood cells in case of genetically determined anemia may be activated and brought to normal functioning.

Besides, cloning also facilitate the insertion of new genes into the genome of an offspring. Polly, Wilmut's second lamb cloned with embryo splitting was genetically engineered to include a human gene. Dr. Wilmut says that their work completes the biotechnological trio: genetic engineering, genomics and cloning.

HUMAN CLONING

There have been several reports of cloning human embryos across the world. Scientists in the field of cloning human embryos, think that reproductive cloning is not difficult today. If cloned embryos are transferred in to the uterus of a women as in the case of IVF, then they may grow in to human beings. Within one or two years a team of scientists somewhere in the world will probably announce the birth of the first cloned human body. Like Louise Brown, the first child born as the result of invitro fertilization, the cloned infant will be showered with media attention. But within a few years it will be just one of hundreds or thousands of such children around the world. The technique used by Wilmut and his co-workers – a technology called somatic cell nuclear transfer- will probably be the way in which the first human clone will be created. Scientists of Advanced cell Technology, USA, claimed that they had succeeded in cloning human embryos using SCNT technology with the intention of developing embryonic system cells from them. However these embryonic system cells from them. However these embryos did not survive long.

Cloning experiment can be viewed under two categories. They are reproductive cloning and therapeutic cloning.

REPRODUCTIVE CLONING

In reproductive cloning which human tissue to use is perhaps a very important question? Each our cells have undergone development and differentiation since we were first conceived. Each different cell type likely has a different set of changes that prevent it from reverting to its original state, as a fertilized egg cell. Quiescence of a cell is when it is so deprived of nutrients that it will no longer divide, but it is not so starved that it dies. Including quiescence may cause the cell to begin scavenging its own proteins more rapidly than they can regenerate themselves. Steps of differentiation may

have turned on certain cell functions and turned off others, but this starvation the cell must reverse these steps of differentiation if cloning is going to work.

Procedure for human cloning will be as follows;

- Grow the human cells to be cloned until you have a good supply
- Transfer the cells to minimal media. This should allow the cell to live, but they should stop dividing and enter quiescence. This is likely the step in which the cells lose their differentiation, and revert to a more totipotent state.
- When the cultured cells are in the quiescent state, get an unfertilized human egg cell. Remove the nucleus from this egg cell. Try to minimize damage done to this cell and discard the nucleus.
- Take one of the quiescent cells in its entirety, and implant inside the coat around the egg (known as the zona pellucida) next to the egg itself.
- Electric impulse to the egg. The electric impulse induces the fusion of the two cells; The rebooting of the human genetic program is believed to be initiated by the replacement of donor cell protein signals, but the electric impulse might assist in moving those protein signals across the nuclear membrane as well.
- Repeat the last three steps as necessary until you have enough clones. Expect a lot of them not to survive because of cellular damage. Allow the embryos to grow and divide a few times in Human egg cell growth media.
- Implant the embryos in human mothers where they can be born normally.

One must understand that cloning does not produce an exact copy of the person being cloned. What cloning does is that it copies the DNA/ genes of the person and creates a duplicate genetically. The person will not be a Xerox copy. He or she will grow up in a different environment than the clone, with different experience and different opportunities. Genetics does not wholly define a person and the personality. Human cloning, however, brings up many new ethical questions that will need to be addressed by the scientific community and the public before these advances can reach their full potential. Scientific advances bring social changes that many people will not be able to accept. As with any scientific or technological advance, the most important question that needs to be asked is whether or not the gains outweigh the potential losses. Will human cloning become a brave new step in fighting diseases and improving the quality of life, or will it lead to dehumanization and a new genetic underclass?

There are people who think that cloning can be an effective means of treating infertility. Using cloning couples can have a child of their own genetic identity. A husband who does not have sperm can use his body cell for cloning an embryo or a woman who lacks ovulation can think of using her body cell for cloning. Parents facing genetic disorders also can think of avoiding normal reproduction, which may pass on the hereditary defects to the child and opt for cloning. According to those who are working in the field of reproductive science, human cloning will lead to huge benefits for childless couples. Reproductive cloning should be considered for couples who have exhausted all other forms of infertility treatment. James Watson, who won Nobel Prize for unraveling the structure of DNA, argues that there is nothing inherently wrong with cloning. Once the technology of human cloning is at hand, even scientists think about only its immediate result, heedless of the inherent ethical issues.

THERAPEUTIC CLONING.

There have been several reports of cloning human embryos across the world. Many of these experiments are aimed for therapeutic purpose, i.e. to harvest stem cells from embryos. Stem cells are totipotent cells found inside the embryos during the first two weeks of their development. They have the potential to develop into any kind of cell of the human body. After two weeks, stem cells differentiate into more specialized tissues. Tissues created from stem cells could be used to treat congenital diseases such as Parkinson's disease, diabetes, and other inborn errors of metabolism. Stem cells could also be used to generate organs such as heart, kidney or liver which can subsequently be used for transplantation into patients with injured or defective organs. Since human cloning has become a possibility the general trend today is to condemn reproductive cloning and condone therapeutic cloning. As research in embryonic stem cell is progressing, many feel that cloning can be a very good source of human embryos for stem cell research and through these method stem cells, having the same genetic quality of the patient himself, can be produced. Scientists are now in a position to clone embryos even from the patients themselves from which they can develop the most suitable stem cells for treating such patients effectively through transplanting those stem cells, which are genetically very suitable to them.

A potentially even more interesting application could involve prompting cloned stem cells to differentiate into cells of the blood and bone marrow. Autoimmune disorder such as multiple sclerosis and rheumatoid arthritis arise when white blood cells of the immune system, which arise from the bone marrow, attack the body's own tissues. Preliminary studies have shown that cancer patients who also had autoimmune diseases gained relief from autoimmune symptoms after they had received from bone marrow transplants to replace their own marrow that had been killed by high dose chemotherapy to treat the cancer. Infusions of blood-forming or hematopoietic, cloned stem cells might reboot the immune systems of people with autoimmune diseases.

There for stem cells can be effectively used in order to repair the damage of different organs and provide adequate cure for certain serious diseases for which there are no effective treatment today. Even though stem cell research is only in its beginning, it has attracted international attention. Stem cells can be adult stem cells obtained from bone marrow, umbilical cord, blood etc. or embryonic stem cells derived from embryos in the blastocyst stage. Stem cells that can be obtained from adults are very few and it is very difficult to convert them for the needed tissue for transplantation. There for the embryos are considered as the most important source of stem cells.

The embryos needed for developing embryonic stem cell can come from IVF Clinics or human embryos cloned for this purpose. In the field of embryonic stem cell research, the highest demand is for stem cell produced from embryos cloned with the cell of the patients themselves. The most serious difficulty we face in organ transplantation is the rejection tendency of the body. At the same time if we succeed to clone embryos from the body of the patient himself and convert them to stem cells, then those cells can be accepted by the body of the patient as its own part because the tissue transplant will be very successful. This is the reason why even those who object reproductive cloning support the idea of therapeutic cloning. But at the same time much scientific work has to precede any clinical application of stem cell therapy. We are still long away from that stage. Those who are enthusiastic about therapeutic use of human cloning are least

bothered the serious moral issues involved in the above said process. So that therapeutic cloning remains totally unacceptable to some people because it involve the deliberate creation of what they deem to be a human being in order to destroy it.

The need to obtain a supply of human eggs leads to one of the most sensible ethical issue in therapeutic cloning research .In each of her monthly cycles, a woman usually produces only one or two mature eggs. To increase that to a number that can be used in research, she must be given simultaneously medications such as those used in reproductive IVF procedures. In rare case, these drugs can provoke a so called hyper stimulation syndrome that can lead to liver damage. Kidney failure or stroke. According to some studies, ovulation stimulating drugs have also been associated with a high risk of ovarian cancer. The surgery to retrieve the eggs also carries risks, such as the dangers of general anesthesia and bleeding. Is it ethical to subject a woman to these risks for research purpose? If women are offered payment to under go these risks might that cause human reproductive material to become viewed as a commodity that can be commercialized? We do not permit the sale of human organs or babies. Are eggs any different?

It may seem that individuals are provide the cells (usually skin fibroblasts) that are fused with enucleated eggs in therapeutic cloning research face no risk apart from the remote possibility of an infection as the site of the skin biopsy. But cloning is a controversial issue that exposes all research participants to novel risks. Cell donors might find themselves at the centre of a media storm if they are identified as having allowed themselves to be cloned.

A major question raised by this cloning research is whether it will hasten the day when people undertake human reproductive cloning. This concern presumes that reproductive cloning is and always will be ethically wrong. Many who hold this view cite the incidence of deaths and birth defects in cloned animals. Others worry about more remote dangers. They point to possible psychological risks to children produced in families in which a parent may also be a child's genetic twin. They fear that cloned children may face unrealistic expectation to live up to the achievements of their genetic predecessor, and they worry about possible social risks of cloning. If societies decide to replicate a limited number of desired genomes on a large scale for military or other purposes. In opposition to this, some people hail the prospect of cloning. They see it as a new way to provide biologically related offspring for some infertile couples or as a means of reducing the risks of some inherited genetic diseases. Whatever one thinks about the ethics of reproductive cloning, placing a ban on therapeutic cloning will not make reproductive cloning less likely. Although the therapeutic cloning could help scientist perfect techniques for reproductive cloning, it could also make much clear the dangers of trying to produce a human being in this way. There is already evidence some cloned animals can experience improper gene expression and disruption in imprinting, the normal pattern of silencing genes not needed in particular tissues. Such problems could discourage prospective parents from using this technology to have a baby. Thus, therapeutic cloning research could actually reduce the likelihood that cloning would be seen as a viable reproductive option. A ban on therapeutic cloning also would not prevent unsupervised researchers from going ahead with reproductive cloning efforts on their own. Groups such as religious cults, Scientist such as Richard G. Seed, a Physicist, who has also been involved in embryology, have announced their intent to clone a human being and

presumably will try to do so regardless of whether therapeutic cloning research is banned. A ban on therapeutic cloning will block useful research while allowing less responsible people to try reproductive cloning where ever they can find a permissive legal environment. By shutting down responsible research on the cell biology of human cloning, such a ban would also guarantee that the first efforts at cloning a human being would be based on scanty scientific information.

SOCIO –ETHICAL IMPACT OF HUMAN CLONING.

The cloning experiments have created an anxiety, fear in everybody's mind. Because although benefits are possible out of this technique the potential for misuse is real. The history of the eugenic movement has repeatedly shown that the economic and social stress can lower our sensitivity to each other and to moral and ethical values. The creative antidote to this lies not in mind numbing uniformity, but in life enhancing diversity which Dolly and identilit sisters threaten to undermine. Aldous Huxley, a visionary had foretold the possibilities of potential powers of such cloning experiments "photocopier" technique, which when applied to humans, can banish sex and flood the world with mass produced clones of a single master image. So far God was supposed to be the creator of life but this success puts human being in God's position. Belief of existence of super power indirectly gives strength and confidence but now if man becomes a creator of human being, the world will be of limited meaning. Capacity to produce such human will change the very meaning of being a human being. Cloning of human is inherently evil. The act is overwhelmingly self-centered. There are many moral, ethical questions related to such experiments and their success. Man's effort to become immortal or to be in controlling seat will create a lot of confusion. This is considered to be leading towards end of everything. Creation was considered to be a right of God almighty but this kind of scientific effort converts it into narcissism. When man will be produced without mating of a man and a woman what will be the relations between the two? What will be the future of family concept? Long term implications of use of cloning can be a cause of worry. Children will be only regarded as products. We are separating reproduction from human relationships. In this issue no one is bothered about the status of woman, and a woman is brought down to the level of an incubator available on rent to accept and grow anybody's clone. Why assume that, is this acceptable to women? This is only a beginning to women? This is only a beginning of deterioration of humanity.

Any way this fear is too early and it will not be so easy to produce a man as it was possible in case of sheep or monkey. Dr. Willmut had done experiment on 300 embryos, out of which 299 failed to give a healthy product. In case of man, experiments show that out of 100 embryos only 5 are able to take up foreign DNA and only one out of these may develop successfully. Thus it is a time taking and costly experiment. Clone will have molecular signature same, But further development may not occur the same way, as it much depends on external factors. Even if an identical clone is made its further development so much depends on the upbringing by parents influence of friends, teachers, that whatever be the source of a clone; may be even if 'Einstein', but there is no guarantee that it would turn out to be the scientist .we will not be able to do cloning of same experiences and memories. Thus perhaps an identical body may be made but not the complete human. We may be able to produce a human which looks very much like some cricketer or singer but when grown there is no guarantee that he or she will have

those skills of a game or singing. Thus intention of producing similar human will become a meaningless and will be injustice on new identical one.

The ill effects of cloning are otherwise also important as explained by biotechnologists. Since the original cell used for cloning experiment is old (as in the case of Dolly it was six year old parent). It might have accumulated many mutations in these years and also we do not know whether the animal born will have life which shorter than the parent, because it started from a parent cell which was already six year old. Human being will try to produce a clone of most powerful human which ultimately will have same defects when considered from point of view of survival, making it indirectly weak and vulnerable and leading to ultimate end. Potential threat to diversity is one of the most concerning issue. Today crops and live stocks have already lost diversity to a considerable extent. The intense economic pressure has already damaged the large varieties of crops and livestock's as uniform varieties with certain good traits are the only one which are mass produced. Same thing may happen to man. Today's human is formed by various mixtures of a man and a women and this has created a huge repository of human genes which has diversity and is a product of evolution. Natural selection process has worked on it and hence it is most fit from survival point of view. If this diversity is lost and if only genes of particular type become ample, after a time it can vanish as there will be no scope for natural selection. According to one jew prophet "We believe in soul which has morality and which loves other human being and if man can make such a soul by its technology, then no one will oppose it, not even the God".

TOWARDS BIOETHICS OF CLONING

It is generally held that the word 'ethics' derives from the Greek ethos which refers to the customs, manners, practices and traditions of a society/culture. If ethics is important in every field, it is all the more important in the area of bio-science and technology, because it directly deals with fundamental human value, namely, human life and the issues closely associated with it like health, reproduction etc. Today the situation has become more complex and pressing because the rapid strides in the biological sciences have made in recent times have enabled researchers to cross the traditional frontiers of biological science and explore various factors and processes involved in human reproduction, genetic influences, foetal development, quality of life etc. and consequent venture into finding solutions for several hitherto intractable problems. While all these seem to hold great promises for the good of humanity, it can also be easily misused and abused, causing serious harm and detriment to human life, including that of future generations. The universal Declaration on the Human genome and Human Rights adopted by the UN in December 1998, Stipulates the following in its article 10: "No research applications concerning the human genome, in particular in the fields of biology, genetics and medicine, should prevail over respect for the human rights, fundamental freedoms and human dignity of individuals or, where applicable, of groups of people" – This is a key bio-ethical statement, applicable not only to the human genome project and cloning but to all endeavors of bioscience and technology. It affects the task and concerns of bioethics which may be described as an interdisciplinary science dealing with the moral aspect and ethical issues involved in the research and application of the life sciences, particularly in relation to human life, reproduction, growth and health. It is where the life sciences and ethics meet with mutual appreciation and collaborate with

mutual respect so that the painstaking efforts of the sciences for allaying human suffering and improving the condition of humans may be carried out with due respect for the dignity of human persons and their rights.

Some opponents of embryonic stem cell research argue that research on stem cells obtained from adults is just as promising and renders stem cell research unnecessary. Most scientists, however, dispute this claim, citing great potential in the field of adult stem cells but several drawbacks as compared with embryonic stem cells. Proponents of embryonic stem cell research advocate funding for both fields.

ETHICAL IMPLICATIONS OF REPRODUCTIVE CLONING:

The deliberations of international, national and state regulatory bodies in most cases favored the prohibition of reproductive cloning in which a cloned human embryo is created with the intent that a human clone will be borne. But they differ considerably over what has been termed research cloning. The latter involves the creation of a cloned human embryo for the purpose of scientific investigation of early human development or for medical research aimed at developing treatment for diseases. Some researchers contend that human cloning should not permit whether for research or reproductive purposes. Though the importance has to be given for medical research and healing of people, yet the harms human cloning would bring to medicine would exceed the anticipated benefits. Reproductive human cloning is hazardous to the gestating clone and the surrogate mother. The status of human cloning technology is still rudimentary. There have been high occurrences of severe physical and genetic defects and premature aging in cloned offspring. Embryologists estimate that a single successful human cloning might come at the cost of hundreds of failed attempts. Even if issues of safety were overcome, which is unlikely, ethical objections remain. Human cloning would signify an egregious disrespect for personal autonomy and limit permanently, and encounter with profound emotional problems. The cloned individual would not be born with the special privilege of having a unique genetic identity, but would live in the shadow of the other person whom the person was intended to duplicate genetically. There would be stigma of being known as a clone, with a confused parentage and expectations to measure up to level of genetic original of replacing a deceased person. All these could result in unforeseen psychological turmoil.

Public opinion justifiably regards human cloning to be a hazardous departure from the intimate and richly meaningful process of natural procreation. It is not technology that is resented upon but its misuse that enables some people to wield nearly absolute control over the genetic make up of others. This substitution of human genetic replication for procreation would amount to a perilous affront to human dignity. Human cloning whether practiced occasionally or otherwise would be a grave devaluation of humanity and would create a shift in societal attitudes away from appreciating people as distinct individuals but seeing people as useful or attractive products of technology. Proposals to ban human cloning for purposes of reproduction have received broad support. However, enacting a ban solely on reproductive cloning, while simultaneously permitting research cloning would lead to several unforeseeable consequences and hence this is undesirable. A ban on human cloning for both research and reproductive purposes would be the most effective and ethically responsible safeguard against the births of human beings by cloning.

ETHICS OF THERAPEUTIC CLONING:

Scientists prefer the use of embryonic stem cells by using somatic cell nuclear transfer. This involves enucleating a cell and replacing it with a donor nucleus. This raises two basic ethical dilemmas. In enucleating the cell, an important value is destroyed, since an individual lies in genetic materials and it is directly linked with the identity of the person. Besides the importance and the centrality of reproduction in the life of an individual or couple is undermined. Human life is sacred from the beginning and so genetic lineage and ancestral relationship are cherished values which are thwarted by this approach. The Pontifical academy of life states that this extreme form of manipulation would destroy the complementary and personalist nature of human reproduction, violate human right of equal dignity by selective reproduction, exploit women to a mere biological function, destroy natural family relationships and create a psychological suffering for the cloned subject as a copy of somebody else.

In replacing the cell with a donor nucleus the mitochondria of one cell is used by the donor nucleus to grow. Mitochondria provide four essential pathways for energy transformation. Damage to any of them accelerates aging in children and adults. Judging from the range of problems that cloned animals have, there are indications that somatic cell nuclear transfer damages mitochondrial genes in the egg. It must be concluded that the present process of therapeutic cloning presents serious risks and can be only described as experimental. Such non-beneficial experimentation cannot be justified ethically. The basic ethical rules of respect, the consent, avoidance of risks, absence of harm either to the subject of research or to those who use this research will hardly be adhered to by this process. Infact there is harm done both personally and to society because it lessens the respect of life in society. Destroying blastocyst to remove its stem cells is a more serious act than enucleating a cell, since the cell is now organized by its DNA and its biological potentiality is clear. This step could be immoral. Declaration of the Pontifical academy of life on the production and use of embryonic stem cells for scientific or therapeutic research argues that this is clear from the encyclical *Evangelium vitae* and the instruction *Donum vitae* which hold that the fruits of human generation must be respected from the very first movement of its existence. Pope John Paul II declared that therapeutic cloning is not morally acceptable since it involves the manipulation and destruction of human embryos.

From the above analysis of reproductive and therapeutic cloning two broad and somewhat opposing themes emerge. There is a moral commitment to healing and to relieving suffering caused through injury and illness. On the other hand, we need to be cautious in pursuing the promise of stem cell research which includes direct harm to the donors of tissues and embryos from which stem cells are derived. There are possibilities of long term harms to society such as damage to our respect for sanctity of human life and inequities from the appropriation or privatization of stem cell resources. Other issues of contention are the status of the foetus and the embryo, complicity on the part of the researcher and the alternative of concentrating on the stem cells found in adults. Some scientists are in the opinion that foetuses and embryo have moral status, as individuals and so must not be treated as instruments.

THEOLOGICAL ASPECTS OF HUMAN CLONING:

Any scientific technology is a human made enterprise. It is developed by Scientists for the healthy growth and betterment of humans. Any decision about the use of technology will have to keep this point in mind. Science and technology are valuable resources for man when placed at his service and when they promote his integral development for the benefit of all. But they can not of themselves show the meaning of human existence and his integral process. They should draw from the person and his moral values the indication of their purpose and the awareness of their limits. According to the directives given by the congregation for the doctrine of faith, science and technology require an unconditioned respect for the fundamental criteria of the moral law. That reasons they must be at the service of the human person, of his inalienable rights and his true and integral good according to the design and will of God. Science without conscience can only lead to man's ruin. The rapid development of technological discoveries gives greater urgency to this need to repeat these criteria. The discoveries made by man are to be further humanized. Therefore scientific technology can never be allowed to become tools of dehumanization. If not it can turn into a monster, which can destroy its own inventers. In this perspective, the technology of cloning human persons can help only to dehumanize him.

The Catholic Church holds very firmly that human cloning is immoral. Reflexions on Human Cloning published by the pontifical Academy for life considered seriously many important arguments to reject human cloning. The Pontifical Academy states that the most urgent need of the time is to reestablish the harmony between the demands of the scientific research and indispensable human values. The dignity of scientific research should be revealed by making research one of the richest resources for humanity's welfare. It means that technology should be transformed into a tool of liberation that human persons should not become the slave of Technology. Some of the adverse consequences of human Cloning are the following. Cloning would render the male unnecessary as far as the procreation is concerned. The male sperm becomes unnecessary for producing the new being. The donor nucleus can come from a cell of the woman herself; the egg-cell obviously comes from the woman. So the man has absolutely no role to the play. Human clone will undermine seriously the preciousness of life. If human life can be mass produced, then the life becomes cheap. In such as society killing and getting killed will not matter much. People will not be afraid to die because an exact duplicate of theirs can be produced easily, and so death will involve no serious loss. Human cloning will affect family relationship too. The family is built on close interpersonal relationship based on deep and genuine love. Sexual interaction and consequent bringing forth of children are fundamental for knitting the family together in mutual love and respect. The bond between spouses is kept alive by love, sexual union and the generation of children. With cloning destabilization of the family will be the natural consequence. A widening of the class disparity is another alarming consequence of the spread of human cloning. Employing technology at its best this procedure will be forbiddingly expensive for the ordinary, rendering it a monopoly of the superrich. The superrich may be able to selectively produce off springs with the best and most desirable qualities. The new law of nature will be not the survival of the fittest, but the richest. Already studies show that the gap between the haves and havenotes is widening. With

availability of human cloning it will widen much further leading to greatest social destabilization.

World religious leaders are definitely against the idea of human cloning. The Catholic Church rejects the human cloning mainly because it denies the dignity of person subjected to cloning and the dignity of human procreation. Another important argument considered is that in human cloning the basic relationship of the person are prevented which would affect negatively the right of the person. Every human person has a right to receive life as a gift of love and not as an industrial product. Similarly, women are radically exploited and harmed in cloning, and are reduced to mere means to provide ova and womb. This is against the dignity of motherhood. The document *Reflexions on cloning* warns that the denial of human creaturely status in fact creates new forms of slavery, discrimination and profound suffering. According to the understanding of this document, the possibility of human cloning violates two fundamental principles, namely the principle of equality among human beings and the principle of non-discrimination, on which all human rights are based.

Any child born through the conjugal union of the parents will have a unique genotype even though he or she has received 50% of genes from father and another 50% from the mother. This is the source of the most important uniqueness of any person. However a person born through the cloning technique will not have this uniqueness. He is only the exact copy of the person who donated the cell. A clone will not have parents but only its original. Cloning is the negation of the unity and unrepeatability of the human persons, for genetically he is only the copy of another person. Human beings are all unique and unrepeatable and that is the source of human dignity. Cloning would be an offence against their fundamental dignity. The human person is endowed with a unique dignity and enjoys the pride of place in the whole visible creation cannot be denied. As a corporeal Spiritual entity, enjoying rational knowledge, free choice, moral sense, self-conscious subjectivity essentially social and endowed with a sense of transcendence, the human person stands above all other creatures on the earth. The special status is well expressed in the statement that “a human person is the only creature on earth that God has willed for its own sake”. This means first of all that humans are not ends in themselves. Their worth and value come not from their being useful for something or somebody else, but from what they are by their make-up; from the personal nature and destiny bestowed upon them by the creator.

CONCLUSION

Cloning seems to challenge the continually reiterated Christian teaching that the procreation of a new human being should be inseparably linked with marital love as the physical result and embodiment of that interpersonal union. The new human being should be the product of love and should be brought to maturity within a loving environment. To date, the only way in which these conditions have been capable of being generally fulfilled has been through the institution of marriage and the institution of family. It is worth bearing in mind that when the Church upholds the institutions of marriage and the family as morally indispensable in society it does so in terms of marriage and the family at their best. According to Catholic perspective cloning is a technology, which manipulate human genetic material so easily and is a serious threat to human dignity. At

the same time this technology if used properly can be very advantageous for humanity, especially in the field of agriculture and animal husbandry.

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