

REVIEW ARTICLE

BIOTECHNOLOGY

HUMAN CLONING: PERSPECTIVES, ETHICAL ISSUES AND LEGAL IMPLICATIONS.



Corresponding Author

SACHDEV YADAV

**Assistant Professor, Department of Pharmacy ,Banasthali University,
Banasthali Vidyapith ,Rajasthan – 304022**

Co Authors

DR. VEENA SHARMA

**Associate Professor, Department of Biosciences and Biotechnology, Banasthali University,
Banasthali Vidyapith ,Rajasthan – 304022**

ABSTRACT

The prospect of cloning animals and Homo sapiens and the ethical and legal implication of such astounding development remained remote and unexplored until recently. Understandably, the mental pictures of identical babies being manufactured in a biological factory offend the natural sentiments of any human being. The ethical aspects of cloning depend upon our perspectives about its process. The development of law in this regard might be a mere speculation now, but those who promote human cloning, have to show and establish with evidence how they are going to deal with different situations, which pose a problem as a consequence of human cloning.



KEYWORDS

Human Cloning, Perspectives, Ethical Issues, Legal Implications.

The announcement of the birth of the sheep named Dolly by an Englishmen, Ian Wilmut and his fellow scientists was news of scientific and technological breakthrough. Dolly shared the softest clothing and white wool of her donor. Dolly was not the handy work of the nature or god but the creation of man. Dolly not only entered this world asexually but also as a genetically identical copy (and the perfect incarnation of the form or the blueprint) of a mature eve.

When Dolly was created the announcement, fired the imagination of the people. It was perceived and speculated that the process of human cloning was not far away. The Los Angeles Times opined that such a discovery “opens the door to a ‘Blade Runner’ world of human replicates”.

James D. Watson and Francis Crick discovered the double-helical structure of DNA, and predicted that human cloning would be possible one day in future and asked that “as many people as be informed about the new ways for human reproduction and their potential consequences, both good and bad.”¹ In 1971, Watson’s prediction and imagination appeared far-fetched and his caution to humanity was ignored and interpreted as of a dream. Later knowledge management in biological sector supported by tangible research and improvements in medical and biotechnological fields and practices paved the way for a series of ethical and legal policy debates in the field of human cloning.

Cloning

Cloning is the process of producing genetically identical organisms, through the division of a

single embryo or through nuclear transfer (replacement of a nucleus in egg by a foreign nucleus). It is a method of reproduction involving the copying of a cell or an individual (producing a clone) from its DNA. Simply stated a clone is a duplicate or a copy.

In the field of molecular genetics, cloning refers to a process whereby individual genes are asexually replicated in microbial culture. When it comes to animals, the aim of cloning is to develop genetically identical individuals. This can be achieved by embryonic cloning e.g. where a fertilized egg at a very early stage of embryonic phase is divided into two or more parts, resulting into two or more identical individuals. Somatic cloning is a new technique whereby identical copies of individuals are created from cells of adult animals. The sheep Dolly was created using this technique.²

The Concept of Human Cloning

The genetic manipulation that produced Dolly is colloquially called “Cloning”. Cloning is a general term explaining any procedure that produces a precise genetic replica of a biological object, including a DNA sequence, a cell or an organism.

Three decade ago, cloning attracted public attention in England. The scientists used the technique of nuclear transplantation after successful asexual production to produce a clutch of tadpole clones. Joshua Lederberg, a Noble Laureate geneticist and a man of large vision is responsible for bringing the chances and promise of human cloning to public attention.

Generally we believe that the children must be wanted children; we expect them to fulfill our



wants and wishes. Through the process of cloning parents can workout their wants and wills on the identity of their children, and they can exercise their control as never before. In this modern age, we are asserting ourselves as independent individuals and are reluctant to acknowledge our links with ancestors whose lives were controlled by traditions. We are advocating the principle of our own-self creation, not only as a self-made man but also as a man-made slave. Self-cloning is an extension of such baseless and senseless recreation. Though indebted to our own ancestors we shy away from acknowledging them. We are not ready to embrace the uncertainties, limitations and challenges of our future involved in the process of human cloning. We have developed a false picture of both the past and the future. The process of human cloning personifies man's desire and wish to control the future fully, and he participates in this process without controlling himself. Inspired, enchanted, enslaved and overpowered by the glamour of technology, we are trying to unravel the mysteries of nature and human life. In this manner, we are happily talking our beginnings into our hands and are ready to play the role of creator.

The State of the Art

We should not underestimate the significance of human cloning and we should neither exaggerate or glorify its importance nor misunderstand the process involved. The process is very simple. The nucleus of a mature, unfertilized egg is removed and replaced with a nucleus obtained from a specialized cell of an adult organism. The nucleus of a cell contains all the hereditary material so the re-nucleated egg and individuals into which the egg develops are genetically identical to the organism that was the source of transferred nucleus. Because of nucleus transfer, an unlimited number of clones will be produced. It is possible to clone the dead

because of laboratory cultivation and storage of tissues, with cells outliving their sources.

Wilmot and his colleague were able to overcome the technical stumbling block to find a means of reprogramming the state of the DNA in the donor cells, reversing its differentiated expression and restoring its full totipotency (the ability of a cell, such as an egg, to give rise to unlike cells and thus to develop into or generate a new organism or a part), so that it could again direct the entire process of producing a mature organism.

Types of Cloning

There are basically three types of cloning.

1. Reproductive Cloning
2. DNA Cloning (Recombinant DNA Technology)
3. Therapeutic cloning.

Reproductive Cloning

The cloning technology involved in generating a living being that has the same nuclear DNA as another already existing organism is called as reproductive cloning. This type of cloning uses the process called somatic cell transfer. This process makes the process of genetic material from the nucleus of a donor cell to an egg cell possible. The process, in fact, removes the nucleus from the egg cell so that all the genetic material present in that egg is separated. After that the genetic material present in the donor cell is inserted into it. After the stimulation and once the cell division starts, the clone embryo is placed in the uterus of a female.

DNA Cloning (Recombinant DNA Technology)

DNA Cloning can be done by two techniques.

Cell-based

Under this type of cloning the DNA fragment is cut off from the chromosomal DNA by using



restriction enzymes and it is attached to a plasmid that has been cut using the same restriction enzymes (this allows for the easy attachment of the foreign gene). Once the gene of interest is joined with its vector (vector is an agent that can carry a DNA fragment into a host cell) it is called a recombination DNA molecule. The type of vector differs in each situation and it can be in the form of bacterial plasmids, viruses, bacteria, artificial chromosomes etc.

Polymerase Chain Reaction

The polymerase chain reaction technique is used in research laboratories and doctor's offices. This is widely used because of the ability of DNA-copying enzymes to remain stable at high temperature. In this technique when all cells divides, enzymes called polymerases make a copy of the entire DNA in each chromosome. The first step in this process is to "unzip" the two DNA chains of the double helix. As the two strands separate, DNA polymers make a copy using each strand as a template.³ the major advantage of this technique is that it is faster than cell based technique and a very small amount of target DNA is used.

Therapeutic cloning

This is also known as somatic cell nuclear transfer, cell nuclear replacement, research cloning and embryo cloning. It is also known as cloning for biomedical research. It is a method by which the nucleus is removed from the egg and is replaced by the DNA from the cell of another organism. The end result is an embryo with DNA almost identical to the organism. Sperm never fertilizes the egg cell, and the genetic material within the cell is virtually identical to the genetic material extracted from the skin or the other cell. This type of cloning is permitted under the law and is used for research purpose in the United Kingdom. It has been incorporated in Human Fertilization and Embryology Act in 2001.

Therapeutic cloning is used as a therapy for inherited mitochondrial diseases.

Human Cloning

Scientists have been cloning elementary substances such as genes and cells for so many years. Today, more routine biological research and many important pharmaceutical applications depend on that sort of cloning, which involves many ethical dilemmas presented by the cloning of human beings.

The creation of human life by human has led to the continuing erosion of respect for the mystery of procreation of human beings. The men or women on the street and the intellectuals, theist and atheist, humanists and scientists all consider human cloning to be "offensive, grotesque, revolting, repugnant and repulsive."

The ethical aspects involved in the process of human cloning make people develop a repulsive attitude towards it. A large number of look alike clones, compromised in their individuality and the combination of father-son or mother-daughter twins and a woman being able to give birth to and rearing a genetic copy of her self, her spouse or her deceased father, disturbs the whole fabric of the society. In view of the recent developments in biotechnology and genetic research, there seems probably nothing to prevent the process of human cloning from happening and this makes people more revolting and rethinking.

Ethical values seem the only voice left that speaks up to defend the central core of our humanity. More so, when every thing is held to be permissible so long it is freely done, in which our given human nature no longer commands respect, in which our bodies are regarded as mere instruments of our autonomous rational wills.

Ethical view of human cloning should be evaluated by how people criticize it



descriptively, through the situation into which we place it.

Perspectives

There are three perspectives of cloning

Technological perspective

This perspective of cloning is an extension of the existing technique of promoting reproduction and identifying the genetic capabilities of children. According to the people who support it, cloning is a neutral exercise with no hidden meaning of good or bad elements. The ethical aspect of cloning exactly depends upon the intentions of the cloners. One of the scientists commented that, "the ethics must be judged (only) by the way the parents nurture and rear their resulting child and whether they bestow the same love and affection on a child brought into existence by a technique of assisted reproduction as they would on a child born in the usual way".

Liberal Perspective

This cloning sees cloning from the point of view of rights, freedoms, and personal empowerment. It is a process through which an individual has the option to reproduce or to have the kind of child that he wants. It seemingly extends supports to women from the restraints of their biological condition. The ethical issue here is no one should be cloned without the consent, and if the clonant is not physically damaged, then the liberal conditions for the ethical conduct are met.

Meliorist Perspective

This perspective of human cloning is that cloning is a platform to improve human beings minimally, by selecting healthy individual by narrowing down the risk of genetic inherent diseases and by creating optimum babies by preserving outstanding genetic material and increasing inborn human capacities on many grounds. They justify the mortality of the process of human

cloning by saying that cloning is solely by excellence of the end.

Ethical issues

Cloning of a human being to produce a child is chiefly aimed to provide a 'biologically related child' to an infertile couple. Human cloning can put an end to genetic disease otherwise generally passed on to generations after generations. It also permits reproduction for single individuals and to secure a genetically identical source of organs or tissues perfectly suitable for transplantation.

There are a section of people who welcome the idea of human cloning to produce children. They proclaim that in the modern globalized society each individual is a master of his own mind and has the freedom to decide as to what is right and what is wrong for him. The United State Supreme Court in *Eisenstadt v. Baird*⁴ spelled out a new principle relating to reproductive freedom: "If the right to privacy means anything, it is the right of the individual, married or single, to be free from unwanted governmental intrusion into matters so affecting a person as a decision whether to bear or beget a child." Hence the utilization of a new infertility technique falls under the reproductive freedom. If 'in vitro fertilization' is accepted as a technology to procreate, human cloning for producing children also forms part of the advanced technology. Another moral value argued by this section of people is that through cloning we are able to instill certain basic necessities of the modern society. This includes good health of the child, fulfilling the dreams of a couple to beget a biologically related child. The ultimate goal is to achieve a fit and healthy world.

The reasons offered by the promoters of human cloning in its support are varied and wide. They include :



An infertile couple desperately seeking a child, "replacing a beloved spouse or child who is on the deathbed or is dead, attempting to conquer the genetic or hereditary disease, permitting reproduction of homosexual men and lesbians who want nothing sexual to do with the opposite sex. Getting a child with genotype of one's own choosing, not excluding oneself. Replicating individuals of great talent and genius. Creating large set of genetically identical humans suitable for research. For instance, in the debate over nature versus nurture or for special mission in peace and war in which using identical humans would be an advantage.

Logic of Slippery Slope

Here is the perfect example of the logic of slippery slope, and the way in which it works is also slippery. Few years ago slippery-slope arguments were forwarded to oppose artificial insemination and in vitro fertilization using unrelated sperm donors. Arguments used to support the practices these practices will be used to support the process of human cloning also. Many supporters of human cloning argue that when one is supporting artificial insemination an in vitro fertilization, one has to support the process of human cloning too.

The other section of people argues that cloning for producing children is violative of basic ethical values. The study conducted by National Bioethics Advisory Commission in June 1997, and more recently by the National Academy of Sciences in January 2002, has indicated different ethical and legal problems that are likely to arise in human cloning.

Problem of Safety

It has not yet scientifically proclaimed that cloning in animal is safe. Since humans are more complex living beings, anatomically there is a high factor of risk involved. The child so produced by will be prone to numerous diseases.

Moreover, till date, of experiments done on animals, only a small percentage of implanted clones have resulted in living births, and a considerably large portion of those live-born clones have suffered complications that proved fatal fairly quickly. Another most important factor is that since this is a new technology, the long term effects of such cloned human beings are unknown.

These are the problems related to human being reproduced by cloning. The donor of the egg is also at risk at losing her reproductive capacity since she has to undergo certain hormonal treatment as part of the egg donation for the cloning process. The woman who carries the fetus is equally at risk. National Academy report projects that: "Results of animal studies suggests that reproductive cloning of humans would similarly pose a high risk to the health of both fetus or infant and mother and lead to associated psychological risk for the mother as a consequence of late spontaneous abortions or the birth of a stillborn child or a child with severe health problems". Even a high success rate in animals would not suffice by itself to make human trials ethically acceptable.

Exploitation of Women

Cloning-to-produce-children may lead to the exploitation of woman who would be called upon to donate oocytes. Since a large number of eggs are required for cloning, an equal number of donors are also necessary. Since the process of making the required amount of eggs involves hormonal treatment, it is dangerous to the health of the donor. Another important aspect is that, in developing and under developing countries, in abject poverty, if monetary incentives are offered to the women of this section, they will consent to it, at the risk of their own health.

Misuse of Cloning Technology



Fanatic parents would try to create carbon copies of themselves or certain famous personalities. There is no assurance that human cloning will be used for genuine and moral reasons like providing a biologically related child to an infertile parent. It can also be used for the reproduction of children for with certain peculiar and grotesque characteristics who can become a threat to the world at large. This can also be referred to as following the eugenics i.e. to improve the genetic constitution of a particular political community or of a human race through various methods. Cloning, allows the selection of a desired genetic prototype, which would be replicated in each of the "offspring," at least on the level of the genetic material in the cell nucleus. The technique of cloning is not yet developed to such a stage that it is infallible. The risk involved and the disabilities and diseases that will be suffered by human reproduced by cloning are not apparent at this point of time.

Some of the following Scenarios Show the Complexity of the Subject

Consider the situation of a homosexual who feels frustrated with his incapacity to bear children and wants to be cloned. Consider the couple that wants to have baby, but the husband is sterile. Assuming that cloning is an alternative, the couple decides to clone the husband, and the wife would contribute as a surrogate mother. Would the child's response to education differ though he is genetically identical to his father? Would he have the same tastes and preference as her husband? What if a divorce occurs? How would the mother see her son, who is the copy of the man from whom she is divorced? Would the father have the right to custody of the child because he is genetically related to his father? In another scenario, where a woman gives birth to her own clone, would she be her child's mother or a twin sister with a different age?

Adverse Effects of Human Cloning

Any attempt to clone a human being is an unethical experiment thrust upon the resulting child-to-be. Many experiments of cloning of animals indicate the grave risk of mishaps and deformities. The issue here is not the benefits and the harms, but the doubts about the very independence needed to give proper consent because it is not just the capacity to choose but the disposition and the ability to choose well. It is not evident to what extent a clone will act as a moral agent.

There is a lot of difference between a naturally born child and a cloned child because the naturally born child comes as a surprise gift to his/her parents whereas the cloned child is the designed result of someone's artful project. So there is every chance that the makers of the cloned child may be subverting the cloned child's independence. A clone, produced asexually lacks two natural parents, so it is a single parent child. It is more justifiable to say it is a twin rather than the offspring of its source. It has no parents biologically speaking.

In addition to the above objections, the process of human cloning creates and opens up the problem of identity and individuality. The cloned person may experience the concern about his own distinctive identity because he is a genotype and he is physically identical to another human being. So his nurture, care and his circumstance in life will be different. Psychic troubled identity along with genetic identity will become worse by confusion of social identity and kinship ties.

The procreation of human cloning is dehumanizing into manufacture and is further degraded and dragged into the process of commodification, a virtually inescapable result of allowing baby-making to travel in the path of commercialization. Many genetic and reproductive biotechnology companies are already showing their interests and they are becoming commercial day by day and human Genome Project is nearing its completion.



Supply of cloned human beings will create enormous demand, even before the platform of human cloning arrives, established companies will have invested in the harvesting of eggs from ovaries obtained at autopsy or through ovarian surgery practiced embryonic genetic alteration and initiated the stock piling of prospective donor tissues. Through the rental of surrogate-womb services and through the buying and selling of tissues and embryos, priced according to the merit of the donor, the commodification of nascent human life will be unstoppable.

It is quite natural for parents to have hopes for their children, but parents who resort to cloning will have exceptions. In the process of human cloning, such overbearing parents take at the start a decisive step that contradicts the entire meaning of the open and forward looking nature of parent-child relations. The child is given a genotype that has already lived, with full expectation that the blueprint of a past life ought to be controlling the life that is to come. Cloning is inherently despotic, for it seeks to make ones children after one's own image and their future according to one's will. In some cases, the despotism may be mild and benevolent. In other cases it may be downright and tyrannical.

Philosophical and Utilitarian Objections to Human Cloning

Two philosophical objections exist. The first is that cloning violates God's will by creating an infant. The other philosophical objection is that cloning is contrary to nature in a way that does not depend on natural process of procreation.

It may be true that the cloned child may be put to various harmful uses. The utilitarian creation of embryonic genetic duplicates of oneself, to be frozen away or created when necessary, in case of need for homologous tissues or organs for transplantation, the necessity of those who would clone themselves and the arrogance of others who think they know who deserves to be cloned or which genotype any child-to-be should

be thrilled to receive. In this way man is trying to create human life and increasing trying to control its destiny and play the role of God. Almost all human being wonder about the uses of process of human cloning to create human beings and everybody is anticipating its possible uses and abuses.

Sexual reproduction of generating a new life from two complementary elements, one female and one male is established and welcomed by human's culture or tradition or by nature. It is the natural way of any mammalian reproduction. Because of this aspect of procreation, human societies are shouldering the responsibilities of nurturing and bringing up children based on the facts of the deep natural process of begetting a child. Children are not only just produced but also well cared for and the relationship of meeting, belonging and obligation is being established. Now, we are trying to change these relationships with little human costs and effort. At this juncture, many questions are cropped up and are unanswered. What is the meaning of kinship without its natural grounding? If there is no kinship, what will be the identity of a child? Many people are referring this type of natural reproduction as traditional way of reproduction.

Asexual reproduction reproduces single parent-offspring and is naturally a deviation from the established way of procreation and is a radical departure from the natural kinship bond of father, mother, sibling and grandparent and all moral relations attached to it. It becomes even worse and radical departure when the offspring produced is a clone derived and created not from an embryo, but from a mature adult to whom the clone would be an identical twin. This process does not happen by natural selection but by human manipulation and design. The objection raised here are manifold. Cloning threatens confusion of identity and individuality and it is a giant step towards transforming procreation into a



manufacture leading to increasing depersonalizing of the process of generation and increasingly towards the production of the human children as artifacts, products of human will and design. Cloning represents a blatant violation of the inner meaning of parent-child relations, of what it means to have a child, or what it means to say yes to our own demise and replacement.⁵ Human reproduction in totality is not simply the activity of our own free and rational wills and choices. It is a holistic activity because it overpowers human beings bodily, spiritually as well as rationally. At some time in future, science may discover a way to produce a clone entirely in the laboratory. Without natural birth; the parent's attitude toward the infant will be deeply compromised. Getting a clone from a laboratory will be getting a puppy from a store. Both creatures might be charming, but neither would belong in any meaningful emotional sense to the owner. Moreover, unclaimed clones would be disposed of, the same way as unclaimed puppies are killed. The programmed reproduction of man will, in fact, dehumanize him.

Ethical Aspects Involved in Therapeutical Cloning (Biomedical Cloning)

Therapeutical Cloning helps in putting an end to the genetically transferred diseases from one generation to another. It also offers the possibility of generating individualized, "rejection proofs" replacement cells and tissues to help patients fight disease and restore health. It helps to find out permanent solutions for certain life threatening diseases.

But this type of research also involves the deliberate production, use, and ultimate destruction of cloned human embryos. Apart from that, there is a clear danger that false hopes may be created in the minds of the people. This also pulls down the dignity of human life. And it is highly impossible to accept

the techniques used and the risk involved even if the ultimate goal is virtuous.

Legal Implications

Several countries have expressed the need to take quick legislative actions to ban human cloning. Various countries have taken different viewpoints with reference to reproductive cloning and therapeutic cloning.

The United States of America

In the US, the president, Bill Clinton, responded very quickly to the news of the birth of Dolly and used his executive powers to ban cloning research with federal funding in the US. He also asked the National Bioethics Advisory Commission (NBAC) to evaluate the implications and influence of this new technology. It made the following five recommendations.

1. It recommended a president's moratorium on the use of federal funds to support any attempt to create a child by somatic cell nuclear transfer should be continued, and all firms, clinicians, investigators and professional societies should be requested to comply voluntarily with the intent of the federal moratorium.
2. It recommended a legislation to be enacted to prohibit anyone from attempting, whether in a research or clinical setting, to create a child through somatic cell nuclear transfer.
3. It asked the United States to cooperate with other countries to enforce mutually supported restrictions on human cloning.
4. Any regulatory or legislative action undertaken to effect a prohibition on human cloning should be carefully written so as to interfere with other important areas of research, such as the cloning of human DNA sequences and cells.
5. It is also advocated that the cloning of animals by somatic cell nuclear transfer



should be subject only to existing regulations regarding the human use of animals, since the technique does not raise the same issues implicated in attempting to use it to create a child.

Following the release of the NBAC report, President Clinton endorsed legislation to prohibit for five years the use of somatic cell nuclear transfer cloning to create a human being and to continue the ban on the use of federal funds for research leading to human cloning. In 1997 and 1998, numerous bills to ban human cloning were introduced in the US Congress. Most were similar to the versions endorsed by the president banning human cloning temporarily or indefinitely any effort to use somatic cell nuclear transfer to clone a human being, protecting other forms of genetic research and calling for future study and reports by the NBAC and other bodies.

President's Council on Bioethics (PCB) came to the conclusion that cloning is morally unacceptable and suggested a legislation banning it. In February 1997, a bill, which would give criminal penalty to the persons involved in the process of human cloning, was kept before the senate. No action was taken till now. Later in the house and senate two competent bills were introduced in July 2001. The Human Cloning Prohibition Act of 2001 was introduced in the senate. The bill suggested the banning of reproductive cloning, therapeutic cloning as well as importation of a cloned human embryo as well as its product. It treated the process of human cloning and the steps involved in it as criminal offence, and the Punishment of 10 year jail sentence and a \$1,000,000 fine was announced. The senate passed this historic bill. This bill banned the process of reproductive and therapeutic cloning completely. Another bill banning reproductive cloning and promoting therapeutic cloning was introduced in the house and called as The Cloning Prohibition Act of 2001. The house rejected the bill.

In May 2002, another bill called The Human Cloning Prohibition Act of 2002 was introduced in the senate and it banned reproductive cloning and promoted therapeutic cloning. Again on May 14, 2002, another bill was introduced in the Senate stating, "It shall be unlawful for any person to engage in a human cloning procedure for the purpose of creating a cloned human being." In this way many bills have been introduced in the senate and house with reference to cloning but none of them has been converted into law. Right now, many contemplate that it will be good if they ban cloning altogether.

Apart from the federal legislations, nine states in the US have laws regarding human cloning. The state of California is the first state to address the issue of human cloning, which banned human cloning or cloning to initiate a pregnancy in 1997. Many other states that followed California are Arkansas, Iowa, Michigan, Dakota, Virginia, New Jersey and most recently South Dakota have passed laws prohibiting reproductive cloning and also prohibited the use of public funds for the research in the area of human cloning.

Arkansas¹

The law prohibits both reproductive and therapeutic cloning. It prohibits shipping, transferring or receiving the products of human cloning. It considers cloning a punishable offence categorized as 'Class C felony'² and the fine is \$250,000 or more or twice the amount of monetary gains that is received by the person whichever is greater.

California³

The law prohibits reproductive and permits therapeutic cloning which indirectly involves embryonic stem cell research including the use of cloned embryos. The law prohibits the buying and selling of ovum, zygote, embryo or



fetus leading to cloning of human beings and levies civil penalties.

Iowa⁴

The law prohibits both reproductive and therapeutic cloning. Human cloning for any purpose is totally banned and prohibited. Transfer of receipt of cloned human embryo for any purpose is prohibited. Human cloning is punishable as a Class C felony.

If violation or disobeying of law results in pecuniary gain, the individual is liable for twice the amount of gross gain. A violation of law is enough to revoke licensure or deny or revoke certification for a trade or occupation.

Michigan⁵

The law prohibits both reproductive and therapeutic cloning. The law is also against the use of State funds for human cloning. It establishes both civil and criminal penalties.

Missouri⁶

The law prohibits the use of State funds for the process of reproductive cloning. It permits the use of therapeutic cloning.

New Jersey⁷

A State Policy prohibits reproductive cloning and permits therapeutic cloning. It permits the cloning of stem cell research and reproductive cloning is punishable as a crime in the first degree. The sale or purchase of embryonic or fetal tissue is prohibited but donation of embryonic fetal tissue is not prohibited. The sale or purchase of embryonic or fetal tissue is considered as third degree crime and the fine is up to \$50,000.

North Dakota⁸

The law prohibits both reproductive and therapeutic cloning. Transferring or receiving of the product of human cloning is considered as a crime. The transfer of oocyte, human embryo, human fetus or human somatic cell for the

purpose of human cloning is considered as a crime. Even an attempt to clone and the process of cloning is considered as class C felony. Shipping or receiving the material of human cloning is considered as punishable as class a Misdemeanor.

The present legal position in UK

The condition in UK is uncertain. Right now technically therapeutic cloning is permitted and this process is called "therapeutic use of Cell Nucleus Replacement" (CNR) and reproductive cloning is banned. This aspect has put UK in a technologically and scientifically advanced position and more advantageous situation when compared to the US where the scale of justice is tilting towards banning cloning in any form.

The catch is if cloning is illegal in US but legal in Japan or China, people will go to those countries, which allow cloning techniques.

Human Tissue Act 1961

It gives permission to remove any part from a person's body after his death if he has expressed the consent that his body or any specific part be used after his death for therapeutic purpose, medical education or research. As a result, if the process of human cloning is legalized, it will increase the pressure on person to sign written consent and possibly, an attempt to develop a doctrine of implied consent.

Human Organ transplantation Act 1989

This act created a regulatory and controlling system for dealing in human organs by *inter alia*, making the dealing in organs for transplantation a criminal offence. It also prohibited and banned the transplants between genetically unrelated persons except where the Secretary of the State provided by regulations. Organs are defined by S.7 (2) as 'any part of a human body consisting of a structured



arrangement of tissues which, if removed, can not be replicated by the body'. The act neither applies to human gametes because they are not structurally arranged tissues and are unicellular nor does it apply to human embryos because they are not the part of the human body. The act talks about the transplants where embryos are transplanted. In short, the Act has no application to human cloning.

The Human Fertilization and Embryology Act 1990

This act prohibited the process of cloning even though it is not clearly evident what the act meant by using the word cloning. According to the Act, other activities like creation of embryo *ex utero* or the storage of the embryo need a license and permission from Human Fertilization and Embryology Authority. The important issue to note here is that if any activity is not covered by the said Act, it is not the subject to legal regulation at all and the issue of human cloning comes under this coverage. During the 1990s, human cloning was not something to legislate for. Right now there is an urgent need for such legislation. The question whether human cloning was covered by the Act or not remains a big puzzle.

India's Stand on Human Cloning

In India, government has officially banned cloning of human being. The department of Biotechnology has banned any research towards human cloning. It also lays down specific guidelines permitting research Stem Cell biology with adequate safety measures.

Other legal issues involved

If human cloning is permitted, there will be many legal problems that demand immediate attention for example:

Inheritance of Property

If 'A' makes a will leaving all his property to 'the children' and then a child 'B' is borne because of cloning from 'A'. Is 'B' a child? The answer may be in the positive. If that is the case 'B' also becomes the child of 'A' own parents, who might have made a similar will and their estate and property may by now have been distributed. It is an established fact that if we decide to permit human cloning, we are entering a battlefield with unimaginable complications, competitions and implications.

Civil Liability

A child who is borne alive but is disabled as a result of an occurrence before its birth may have an action in negligence against the person responsible for that occurrence. Many existing acts only deal with situations where a duty of care was attributed to a parent of the child and, in the case of cloning; there is the obvious difficulty of deciding precisely who that parent is. If reproductive cloning is allowed there is every possibility of the child bringing a petition demanding an action for the negligence. The negligence may be in the form of selection of wrong embryo, or in the form of giving advice to the parents of the cloned child, or in allowing a child to be born with a particular genetic inheritance, in allowing a child to be born with a particular genetic inheritance, in allowing a child to be born when the primary sole objective is to provide tissue for another child. In this case, the child to be born had been deprived and robbed of its rightful status as a child by being born, not for its own survival but for the survival for another.

'To Ban' or 'Not To Ban' Human Cloning

The pressure to legalized therapeutic human cloning is coming from international commercial organizations. When it becomes a reality, the organizations will wish to protect their rights to get profits from the process with a patent. The Biotechnology Patents Directive



steadily is prohibiting patenting processes for the cloning of human beings. In November 1997, UNESCO issued the universal declaration of the human genome and Human Rights which provides, in clause 11, that 'practices which are contrary to human dignity, such as reproductive cloning of human beings, shall not be permitted.' An astonishing fact is that this declaration points towards reproductive and not therapeutic cloning.

CONCLUSION

This article has concentrated on present ethical issues involved in the process of human cloning. Nevertheless, human cloning is not possible now. One can not make law in vacuum. The research in this particular area of science can not be stopped. One can ban a risky drug by enacting a law, but the only impact is, one is limiting its use to those who are willing and able to pay the airfare to the place where the drug is available. Then what should we do? If we declare that human cloning is unethical and dangerous in itself we may have the backing of many people. In the next series what we can do is to completely ban the process of cloning of human beings. We could accomplish it with the help of an international ban. But the scientists and researchers may secretly undertake to violate such a law.

A premature ban on any scientific process involved in human cloning could well arrest the useful research on the genetic basis of diseases or say on opportunities for improving agriculture. A great deal of research is going on to modify the genetic structure laboratory animals to study illness and to study human proteins and antibodies. There is no proof that such research holds good. If the process of therapeutic cloning is unrestricted, it

is sure that it will make the production of living human clones much more likely. Once the scientists put the cloned embryos into the bottle, one can not control the way they would proceed, in the absence of necessary legal prohibitions. In spite of many objections, research in this area can not be stopped and the research would continue and keeps the process of cloning as a marginal practice.

There is no need to react and protest to the process of human cloning immediately. The path of travelling from one sheep to many sheep and from sheep to other animals and from animals to human beings is too long and difficult. Dolly was a lone lamb created out of 277 embryos and her life span lasted a mere six years. She passed away in 2003 due to progressive lung disease.

The process of human cloning is not the same as Xeroxing. The success rate is very limited. So there is no immediate worry of mass scale production of human copies. The expenses and the need of repeated surgeries of numerous borrowed wombs for implantation will definitely limit the use of the process of human cloning. Moreover, human beings would continue to prefer to give a natural birth to their young ones unless handicapped otherwise.

Looking at the past and the future of the human beings, there is a vast scope for studies in this field. Policy makers should learn from the legal and ethical concern associated with human cloning and develop coherent policies that recognize and clearly address emerging social controversies related to human cloning. To conclude the controversy over human cloning let us remember the quote of Ian Wilmut, "What is natural" he points out "is not necessarily right, and what is unnatural is not necessarily wrong".



REFERENCES

1. James D Watson "Moving towards the Clonal Man," The Atlantic Monthly, May 1971, at 50-53.
2. 405 US 438 (1972)
3. The Ethics of Human Cloning Leon R Kass and James Q Wilson
4. Ark. Code§20-16-1001 et.seq
5. If any person creates a situation of unreasonable risk and high probability of death or great bodily harm to another it is classified as Class C felony." <http://nsi.org/Library/Compsec/computerlaw/Wisconsi.txt>
6. California. Bus. & Prof. §16004,16105;Cal. Health & Safety§§24185-24187(2003)
7. Iowa Code, Chapter 707b "Human Cloning Prohibition Act"
8. Mich. Comp. Laws§§333.26401-06, 333.16274, 16275, 20197, 750.430a (2003)
9. Mo. Rev.Stat. §1.217(2003)
10. A.2840/S. 1909 (Enacted 2004)
11. ND Cent. Code§§12.1-39-01-02 (2003)

Articles

13. James D Watson "Moving towards the Clonal Man," The Atlantic Monthly, May 1971, at 50-53.
14. *The Ethics of Human Cloning* Leon R Kass and James Q Wilson

Websites

15. wwwprod.novonordisk.com
16. www.accessexcellence.com
17. www.usccb.org
18. www.bioethics.gov
19. www.betterhumans.com
20. www.unitedforlife.org
21. www.ornl.gov
22. www.humancloning.org
23. www.globalchange.com
24. www.cs.virginia.edu