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MEDICAL ETHICS

Playing God?

A UK laboratory clones a sheep, unleashing a worldwide furor over the ethics of genetic research and the specter of duplicating humans

In July 1996 a Blackface ewe gave birth to lamb 6LL3, an outwardly normal baby sheep, at the Roslin Institute's genetic research facility in Edinburgh, Scotland. In the February 27, 1997, issue of Nature magazine, Roslin's chief researcher Dr. Ian Wilmut stunned the world when he announced that 6LL3 (now named Dolly, after American country singer Dolly Parton) was the first successfully cloned mammal. Wilmut was summoned to the British Parliament, and later to the US Senate. He informed alarmed committees on both sides of the Atlantic that he foresaw no particular obstacle to the cloning of humans--the creation of a genetic duplicate of another person. Shocked politicians realized Wilmut's accomplishment coupled with advancements in genetic engineering could alter the future of the human race in a manner not seen since the discovery of atomic energy.

A clone is a genetic duplicate of another organism. Its only natural occurrence in humans is identical twins, in which each share the same DNA and thus develop physically into nearly identical people. Within a few years, predicts Wilmut, cloning humans will be a very real possibility. Why would we do it?

There are many reasons, some wonderful, some unquestionably immoral. A woman whose husband and child died in a car accident could replace the child by cloning. It has been seriously proposed to clone people to serve as a spare parts depot from which to replace failing hearts or kidneys. Cloning may be possible with the long dead, too. We could unwrap mummified Egyptian King Tut and make a new copy of him, or of Einstein, or of the 5,000-year-old Stone Age man found frozen in the Alps--even revive mastodons. We could take a piece of Buddha's molar from the Temple of the Tooth in Kandy, Sri Lanka, and recreate the physical body (though not the enlightened soul) of Gautama Buddha. We could take locks of hair preserved from saints, or dig up samadhi shrines where they are entombed.

The prospects get scary when cloning is combined with genetic engineering (the actual intent of Wilmut's research with sheep). DNA could be taken from a person, customized with genes for disease resistance, intelligence, beauty and then grown into a baby. The perfect musician or the creative genius could be ordered up by calculating parents to be--as could be the perfect unquestioning soldier or murderous sociopath by the less altruistic.

The territory is so new that world leaders are in an ethical void on what to think about it. A host of questions are suddenly being addressed by scientists, politicians, philosophers and religious leaders. After Wilmut's announcement, US President Clinton forbade any federal research on human cloning pending formal review by the US National Bioethics Commission--a significant part of which is to solicit opinions of the world's religions.

Most religious leaders, including Hindu, are opposed to cloning humans. Many consider it "playing God" and therefore wrong. Others question the necessity for another way to make people at a time when we have too many people. Putting these opinions in perspective requires a certain amount of technical background as to exactly what cloning is, how it was accomplished and where genetic engineering fits in.

Every cell a blueprint: It has long been known that each cell contains the complete DNA genetic code, unique to that organism. However, in the growth process, as cells become specialized, parts of the DNA code are "turned off," so that muscle cells make only new muscle cells, brain cells new brain cells and so on. Before this discovery there was no way to make a muscle cell spawn a brain cell, even though the genetic code to do so was present. Many plants are different. Their cells are able to reprogram themselves. That's why we can take a branch cutting from a tree, plant it and have a complete new tree, a clone, develop. The first cloned animals were tadpoles (in 1952), but the results were partial and no adult frogs developed. Scientists thought cloning a mammal would require another half century of research. They reckoned the most likely way was to replace the DNA at the very first stage of growth, in the egg, but had no idea how to accomplish it.

Wilmot's group solved this dilemma with masterful ingenuity. Harvesting and isolating an egg from an adult female sheep had already been done. In fact, the technique is used reliably in humans for in vitro fertilization--"test-tube babies." The second step was removing the DNA-containing nucleus of the egg. Then came the hard part. They took a cell from the

mammary gland of an adult sheep and put it into a dormant state, essentially by starving it. During dormancy, they hoped, the cell would forget its mammary identity and be prepared to generate an entire new organism, something that occurs naturally only when the egg is fertilized by a sperm cell. Wilmut used an electric spark to "fuse" the dormant cell into the egg, and, to the amazement of all, an embryo started to develop. The embryo was placed in a surrogate ewe--a process also perfected in humans--and Dolly was born. Hello!

There are four individuals involved in the cloning: the donor (male or female) of the DNA, the donor of the egg, the surrogate mother and the clone. The clone is an identical DNA copy of the cell donor (and always the same sex), and unrelated to either the egg donor or its own birth mother. It required 277 attempts to create Dolly. Some eggs failed to develop, others died during gestation, some were stillborn and others born alive but deformed. Wilmut himself opposes cloning humans, because at this stage researchers would be faced with one success and 276 abortions, stillbirths and deformed babies.

The discovery came cheap. Wilmut's team of 12 managed it on a research grant of US\$500,000/year. That's far less than what Nissan spends to develop next year's car model, and mere lunch money compared to the multiple billions spent developing the atomic bomb or going to the Moon. Even though the British government has canceled Wilmut's grant, private companies are rushing to supply him money if he wants it.

DNA is but one factor, albeit an important one, in determining the physical characteristics of a human. Studies on identical twins raised separately reveal they will be, on average, within two inches of the same height, ten pounds of the same weight and six points of IQ. Their fingerprints will be similar, but not identical. They'll have a remarkable affinity for the same medical problems, even communicable diseases. For example, if one twin has diabetes the chances are 80% the twin will, too. Similar figures apply for feeble-mindedness, tuberculosis and even criminality. This is vital to the prospect of using cloning for organ transplants, because a clone raised for "spare parts" is likely to have the same weaknesses as the DNA donor--be it heart, kidney or whatever.

Identical twins can be astonishingly similar in even the smallest physical features, and share many personality traits as well. One set of twins separated at birth in the USA was recently reunited. Among a long list of shared traits, both had become firemen, both grew moustaches, both held a beer glass with the same peculiar grip and both had pet dogs--to which they had given the same name! So far there is no precedent for identical twins growing up separated by time as well as space, as would be the case with clones. It is expected the different environment and astrological chart (see page 36) would result in greater distinctions between donor and clone.

Genetically engineered perfection: Wilmut and associates did not develop cloning as an end in itself. Their main goal is to produce genetically altered sheep whose milk contains commercially profitable hormones for humans. Once one such sheep is successfully made--a very difficult process--it can be cloned again and again. Researchers are similarly attempting

to create animals that generate human clotting factor (to treat hemophiliacs) and genetically altered pigs whose organs could be transplanted into humans.

Reproduction by cloning holds the key to genetic alterations to cure certain incurable diseases. Before the donor nucleus is implanted into an enucleated egg, its DNA can be altered. By such "genetic engineering" some 4,000 incurable genetic diseases could theoretically be eliminated. But such cures are not welcomed by all. The large deaf community in the USA has complained that if deafness is eliminated, their distinctive culture, sign language and literature will disappear. If cloning technology were perfected, made-to-order, genetically engineered humans would be the logical next frontier. A superhuman could then be perpetuated by cloning it again and again, just as Wilmut cloned Dolly.

Cloning from the Hindu view: Cloning in India took a wrong turn about 6,000 years ago with the creation of Raktabija ("blood drop"), a mythological demon who appears in the Markandeya Purana. Another of him sprung from every drop of his blood spilled on the battlefield. Only with great effort were he and his clones finally destroyed. More benign results were obtained by dozens of other methods of asexual procreation found in the vast scope of Hindu literature. For example, Lord Ganesha was created from the skin of His Mother and Lord Murugan by a spark from Siva's third eye. Kunti conceived her sons, the Pandavas, by means of mantras (sacred formulas) offered to the Gods.

Even so, there is really no easily found scripture directly

addressing the practice of cloning, just as there was no need for a Federal Aviation Agency before airplanes were invented and started to crash. In Hinduism and the other religions, endorsements or objections to cloning are necessarily based upon induction and extrapolation.

Hindus analyze cloning in Hindu terms--karma, reincarnation, ahimsa, all-pervasive Divinity and soul's evolving nature--along with the benefit or danger to society as a whole. In a survey of seven Hindu leaders conducted by Hinduism Today [sidebar], all called strongly for strict regulation. Acharyas and swamis were unanimous that scientists were in no way creating a soul by cloning, in contrast to the Abrahamic belief that the soul is created at conception. In the Hindu view, the God-created soul inhabits the body, but is not the body. The question arises: what kind of soul would take birth in a body created so uniquely. At a gathering of the American Association of Vedic Astrologers (AAVA) Chakrapani Ullal said religious sanctification of marriage helps insure the birth of high souls. Lacking such sanctification, he warned, "people born through cloning will be fraught with problems." Speaking from the view of ayurveda (India's traditional medicine), Dr. David Frawley (Vamadeva Shastri) pondered, "You are trying to have birth without prana [vital life energy]. What kind of creature is going to be created without direct participation of the pranic force?" Mrs. Ullal asked how a normal being could be born from a "conception" devoid of love. The 2,000-year-old Tirumantiram supports their wisdom, describing how each embodied soul is influenced by the consciousness and energies of the parents before and during coitus. Without these pranas, life would certainly be different, though not all think negatively. Perhaps a highly-evolved soul would choose to take such a passionless birth. Dr. M. M. Sankhdher, ex-professor of political science,

University of Delhi offered: "To a Hindu, a cloned human being, when this reality materializes, would be another manifestation of a new species as an outcome of the Divine Will."

The research itself violates the tenets of ahimsa, noninjuriousness. Several of Wilmut's sheep, for example, were killed and autopsied by the researchers after their fetuses died. In ayurveda, research on animals is allowed only to benefit the animal. If human cloning is permitted, deformed fetuses will certainly be aborted as part of the larger process. Dr. Dennis Harness, of the AAVA, warned of potential long-term problems, "Cloning involves altering energies on a very subtle level where we don't even realize what we are doing."

Bhairava Sundaram Sivacharya, who belongs to an ancient lineage of Saivite priests, said that Hinduism has always welcomed new discoveries. He asks, "A soul is born with a parabdhha karma [the karma it is destined to experience in this life]. When it lives through the parabdhha karma, that body will die. Now if we take a cell from that body and make another man, do the parabdhha karmas of the first man continue in some way? If so, the original soul cannot get released into the next world upon the body's death. It will bring a great confusion."

Several prominent swami leaders questioned the need for cloning in an overpopulated world, where abortion of unwanted children occurs daily. Rev. Swami Satchidananda warned about unanticipated consequences, the problem of "letting the genie out of the bottle" and not being able to get it

back in. Many warned cloning would result in the same havoc to society and the environment as have so many other scientific inventions of the last few centuries.

In a joint statement, Dr. Ajit Ram Verma, ex-director of the National Physical Laboratory of New Delhi and Dr. I. S. Kothari, ex-professor of physics, Delhi University, said, "In an intelligent society, cloning could be used for the betterment of the society. But today decisions may be based on considerations other than society's good. Therefore, research in the field should be carefully controlled." A poll of the US Hindu Students Council concluded, "Hindus believe that man is neither superior or inferior, but simply a part of nature as are the trees, animals, and so on. By manipulating nature, we may be upsetting natural and spiritual balances."

Pramukh Swami Maharaj observes that "Human cloning would mean a parentless society, full of surrogate mothers, careless donors and loveless children." He says a race of clones might develop alongside the human race--with unknown consequences. Clones may be regarded as less than human. Genetic engineering raises other questions, and Pramukh Swami quoted scriptures that warn against introducing animal qualities in man or vice versa. Hindu leaders are divided on whether possible benefits outweigh the risks. Some urge an outright ban; others call for close supervision. Mata Amritanandamayi said, "Historically, it is impossible and unwise to interfere with the advance of science." She and others call for a forum of "spiritually aware and responsible people" to advise industry and governments on cloning. No one polled was willing to leave the regulation to science or business alone, recognizing that the consequences impact all

of humanity.

Other religions react: Jewish Rabbi Gershon Gewirtz said, "I think there are too many things we just don't understand. In my view, the risk is just too great." Roman Catholic Cardinal John O'Connor said, "Contrary to the right of every human person to be conceived and born within marriage and from marriage, the clone is reduced to the level of a product made rather than a person begotten." The Navajo Indians of the Southwest US hold the sheep in particular sacredness, and complained that the scientist desecrated the animal. Muslim scholar Abdulaziz Aachedina, a medical ethicist at the University of Virginia, worries about the long-term implications of separating reproduction from human relationship. "Imagine a world with no need for marriage," he invites.

Governments act: Malaysia and France reacted by banning human cloning . In February the US Senate considered a permanent ban, and the research for this article will be part of future deliberation. Senator Tom Harkin protested any ban, defending the impossibility of limiting human knowledge. "What nonsense. What utter, utter nonsense to think that somehow we are going to hold up our hands and say, 'Stop,' " he told his colleagues.

Cloning will not stop. It has been done for a sheep. In a few years it will be done with humans. Cloning may become as easy as ordinary reproduction, with profound consequences on human society. For this reason, and remembering we represent one-sixth of the human family, all Hindus should take a serious interest in this issue.

Human Cloning

1. A single cell is taken from the donor woman (or man), for cloning.

2. The donor cell is starved into a state of quiescence in which it stops reproducing on its own.

3. An unfertilized egg is taken from a second woman and the genetic nucleus is removed.

4. The enucleated egg is kept alive in a test tube.

5. After 36 hours (for sheep; humans may differ), the donor cell is fused into the egg with an electrical spark which also starts cell division.

According to Hinduism, an incarnating soul enters at this point, drawn by its karma and by the consciousness and karma of those involved in the conception.

6. For six days (in sheep) the developing egg is kept alive in a test tube.

7. If the embryo is growing normally, it is implanted in a surrogate mother who carries it to term and gives birth normally.

8. The offspring is an exact genetic duplicate of the cell donor, and has no genetic relationship to the egg donor or to the surrogate birth mother.

Hindu Leaders on Cloning

Swami Satchidananda (Integral Yoga Institute): What is the need for it? It is simply scientific curiosity, and you know curiosity killed the cat. We may think we are doing something good, but if it turns up bad, then we don't have any control over it.

Tiruchi Mahaswamigal (Founder, Kailash Ashram, India): It is

not new to our cultural history of India. We did not call it cloning, but there were other methods of procreation. Presently we do not require any such alternative methods of procreation for population, so man need not develop them.

Pramukh Swami Maharaj (Head, Swaminarayan Fellowship): Human cloning is not a matter of a few scientists' research, a few nations' decision or a few leaders' preference. The entire humanity should unite to control this crisis; future generations shall hold us responsible.

Swami Omkarananda Saraswati (Founder, Omkarananda Ashram, Europe, India): Imagine, through millions of abortions around the world, how many saints and benefactors of mankind are destroyed! In the face of this, how senseless and damaging to spend money and God-given time trying to produce unfortunate artificial copies of human beings. The aim of Creation is to help the creature not into false channels, but guide it into the world of knowing, loving and being one with the Creator.

Mata Amritanandamayi ("President of Hinduism" at Parliament of the World's Religions, 1993, Hindu of the Year, 1993): The idea of cloning, though implemented only recently through modern science, was in the minds of the ancient saints and sages of India. Man's attempts to change the natural order of things has a long-term potential of unexpected negative results. Forums of spiritually aware and responsible people can advise a prudent course of action.

Paramhans Swami Maheswarananda (Founder, Sri Deep Madhavananda Ashram, Europe, India): This kind of activity is contrary to ethical and moral principles. Our beloved Master Bhagwan Sri Deep Narayan Mahaprabhuji says, "Do not go against the nature, or else it will take revenge, and you will have to suffer the consequences." Manipulating nature is greatly damaging our Holy Mother Earth.

Swami Chidanand Saraswati "Muniji" (Head, Parmath Niketan, India): The egg needs a waiting soul to activate it and to turn on the potentialities in the genes at proper times. It would be unfortunate if all persons looked like one another, God intends a rich variety. A lot of evil can result from human cloning. However the extension of knowledge should not be stopped. Genetic engineering should go on under strict conditions of global regulation with input from the different nations, races and genders.