

FOCUS

Is Human Cloning a Reality?

Dr Rashidul Haque writes from Emory University, Atlanta, USA

THE announcement that a Scottish research team has successfully cloned an adult sheep has electrified the whole world. This achievement made by Dr Ian Wilmut and his co-workers at the Roslin Institute near Edinburgh, Scotland, marks the first time anyone has successfully cloned an adult mammal. Dolly, the name of this startling creature, is not like other mammals that has ever lived. Dolly is exceptional because she has been born not through sexual reproduction or mixing of genetic characters of parent's reproductive cells. The unbelievable part of Dolly's creation is that she is the product of a body cell and an identical copy or clone of an adult.

all embryos (clones) are identical too. Mice, sheep, cows are the examples of this sort of clones produced by this method.

The latest technological development to make a clone has been made by taking a whole nucleus that contain the entire set of chromosomes and injecting into a fertilised egg whose own nucleus has been removed. Before the discovery of a sheep clone made by the Scottish researcher, scientists carried out successfully such experiment in frogs and mice.

History of Animal Cloning

Though plants have been cloned for centuries, the successful cloning in animals was made only 22 years ago. British biologist John B Gordon created some tadpoles from the skin cells of adult forms in 1975. But the survival rate of cloned tadpoles was very low, only one tadpole survived to maturity. JD Bromhall, another British embryologist, produced four rabbit embryos by cloning in the '70s, but he could not complete his experiment due to financial restraints.

The scientists in the University of Oregon made about 875 copies of an adult zebra fish by cloning in 1981. In the '80s, some companies in Canada and USA created cloned copies of a

imals. But this technique has been used successfully for the first time in primates (monkeys) — species close to humans. The US scientists reported in a newspaper just after the Scottish scientists announced they had successfully cloned an adult sheep from the body tissue that they have produced two monkeys from cloned embryos. To produce the monkeys, researchers harvested eggs from an adult female monkey, then fertilised each of them in vitro. After about three days, the embryos divided to the eight-cell stage of development. The DNA collected from each divided embryo cell by teasing the cells apart were inserted into fresh egg stripped of its DNA. Nine such successfully developed embryos were implanted into adult females out of which two live births resulted.

Cloning of Humans — Next Step

In spite of strong objections on religious and moral grounds, many scientists now think that it is only a matter of time before the technique is applied to human beings. The experts say either greed, scientific drive or a misguided desire to play God will guide some researcher somewhere to take the plunge into mankind's

cloning. However, the Belgian Professor Robert Schoyans, head of the team at the Helmont Hospital in Vilvoorde rejected such report and said that his laboratory practices in vitro fertilization and deal with about 800 cases a year. His laboratory uses a different approach called 'hatching technique' where a frozen human embryo is thawed and the surrounding membrane is rubbed so that the chances of egg escaping and its implantation into the mother's uterus are improved. The Professor said that though the embryo can later divide and produce identical twins, but his experiment is nothing related to the cloning.

The first-ever cloning of an adult mammal (a sheep) has raised serious ethical questions about where the experiment will lead. Twenty years ago, when only the tadpole had been cloned, bioethicists raised the possibility that scientists might someday advance the technology to include human beings as well. Now, the cloning of a mammal is done and of a human being is within easy reach. Scientists opinion in the US has been divided on the prospect of human cloning. According to a CNN/Time Poll based on interviews with 1005 adult Americans, most Americans think that it is morally

victimised because this is the only natural way we have to get baby. Who would intentionally bring a deformed, pain wracked child into the world if it could be avoided? The new technology can positively help a couple who have high probability of passing a genetic disease to their children by cloning just one parent, resulting in a disease-free child. This could be a twin son version of a parent.

Couples who are otherwise unable to have children due to such problems as sterility, will now be able to have a child that is still biologically theirs. If such a situation happens that a child died and the parents want another same child, then another cloned embryo (which could be done when the first child was in the embryonic stage) could be implanted in the mother's womb again. Then, she would give birth to another child who could be the exactly same as the child that she just lost.

We cannot bring Rabindranath Tagore, Beethoven, or Albert Einstein back any more in our society. Their bodies and DNA have long been decomposed. But we have other talented people now in our society like scientists, athletes, singers, poets, politicians and others whom we can think about and have their several

Jurassic Park, the scientist created the dinosaurs from the mosquito blood that contained dinosaur DNA. The mosquito was trapped in an amber fossil some 65 million years ago. I watched two movies on human cloning and thought how people's mind could think of possible human cloning in future some 23 years ago. One was a classic comedy of Woody Allen of 1973, *Sleeper*, where he was trying to get their leader back who died in a terrible bomb blast, by cloning from his only remaining tissue of nose. The second movie, *The Boys from Brazil* of Gregory Peck, was a serious one.

Thinking that scientists one day can clone an individual from a single cell, Adolf Hitler offered some cells from his blood and rib muscles which he ordered to freeze for future use. After the World War II was over and Hitler died, a Nazi scientist took Hitler's frozen cells, made 94 clones of Hitler and spreaded all over Europe and North America again to make Hitler of the 1980s, 1990s and 2000. In the movie, they tried to perpetuate evil. Watching two movies I figured out two things. In *Sleeper*, people were desperately trying to have their great leader back, because they were running a leaderless society; and in the second movie, the Nazis were trying to perpetuate the leader of terror all over Europe and America again. It means, people could use this technology in both good and bad purposes. There is no such thing as bad science or technology, only bad applications.

The British scientists has undoubtedly stunned the whole world by cloning an adult sheep from a body cell. This is indeed a very big step forward in the scientific world. The modern genetics and genetic engineering technology started their initial steps only in the '50s, after James Watson and Francis Crick discovered the chemical structure of the DNA molecule. Now, genes from human are already working in microbes, fish, rabbits, mice, pigs, sheep and cows. The human society is getting a lot of outstanding benefits from the gene cloning technology. On the other hand, the scientists always faced a lot of pressures from the society whenever they discovered some novel stuffs beginning from the antibiotics to the creation of Dolly. Antibiotics and other modern medicaments can be said unnaturally prolong human life, and yet not many object to these anymore. We should keep it in our mind that there is no such thing as bad science or technology, only bad application. It is the people who misuse it. The best thing we can do is to proceed slowly and very cautiously. Since we now have the ability to alter life on earth, we had better think hard about the kind of world we want. It is no good simply reacting to today's headlines with dismay and revulsions. I am not advocating spawning an army of clones.

The technology inherent in such a process, however, would have many scientific and medical benefits that would spin off to these areas. We should keep it in our mind that there is no such thing as bad science or technology, only bad application. It is the people who misuse it. The best thing we can do is to proceed slowly and very cautiously. Since we now have the ability to alter life on earth, we had better think hard about the kind of world we want. It is no good simply reacting to today's headlines with dismay and revulsions. I am not advocating spawning an army of clones.

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single embryo, mass-producing identical cattle a few dozen at a time. But these cattle are clones of each other, not any adult animal.

Dr Ian Wilmut, a Scottish researcher, improved a mass-cloning technique in sheep that could create potentially hundreds of animals at a time. In 1997, he produced a healthy baby sheep, named Dolly, from single mammary gland cell of an adult sheep. And this is the first time in the history of animal life.

Technique for Sheep Cloning

Dr Ian Wilmut and his colleagues used the following techniques for successful sheep cloning. They took unfertilised eggs from an adult sheep and mechanically removed the egg nucleus which contains the genetic material (DNA). They then took cells from another sheep's mammary gland, kept them in a test tube and inactivated the cells by limiting their nutrients. The DNA materials from the mammary cells were introduced into the unfertilised egg cells. An electric current was applied to jump-start the egg and stimulate the burst of energy that occurs during fertilization. In Ian Wilmut's experiment, only 29 out of 277 fused egg cells survived for a few days. Eventually, the surviving embryos were surgically implanted into the uterus of 13 ewes one of which became pregnant and gave birth to Dolly.

Cloning in Monkeys

The cloning technology or nuclear transfer technology in this case producing animals from embryos is not new. This technology has already been applied to mice, rabbits, cows, pigs and sheep, among other an-

genepool. Dr Arthur Derse, director of Medical and legal affairs at the Center for the Study of Bioethics in Wisconsin, USA, said: "It's the kind of thing that gets it out of the bag, you are not going to get it back in. There is no theoretical reason why it couldn't be done in human beings right now". The British scientist responsible for Dolly said that human cloning could be possible in two or three years but he also added that there should be international laws to prevent such works. *Nature*, the top ranked scientific journal that published the Dolly's paper (Feb 27, 1997) editorialised: "Cloning humans from adults' tissues is likely to be achievable any time from one to 10 years from now". Dr Phillip Wyatt, Chairman of the Genetics section of the Ontario Medical Association, said: "There are reasonable circumstances in the future where cloning of human material would be quite desirable".

In 1998, Dr Jerry L Hall at George Washington University cloned human embryos. He took cells from 17 human embryos, all two to eight cells in size. He teased apart the cells, grew each one in a lab dish and got a few 32-cell embryos — a size that could be implanted in a woman. This news struck a moral blow around the world the first time any one had dared violate the sanctity of creation since abortion. Dr Hall's idea for the embryonic cloning was one of the promise for people who might have troubles in seminations, low egg counts, infertility and situations of the like. The project has not yet produced any children. Now we know that human clones have already been born in Belgium using the method of embryonic

unacceptable to clone either animals or humans. President Bill Clinton has ordered a special panel to review the ethical implications of this scientific breakthrough. Pope John Paul II called for a ban on cloning of humans and told that this type of dangerous experiment would harm the human dignity.

Some Benefits from Human Cloning

Human research can be simplified by cloning some people and use them in experiments on drugs and other. By doing so, we would rule out the variable that exist now between people who are not identical.

Besides the cloning of entire human being, we could clone different vital organs (liver, heart, lung, pancreas or kidney) of a body separately which would be very valuable. For example, pancreatic cells from a diabetic patient or kidney cells from a person with damaged kidney could create a second pancreas or kidney and put them in sheep or other hosts, and have them regrow. So, people who can use their pancreatic or kidney cells, for example, to have them regrow in other animals as a spare part of their own body organs, can now get them transplanted back in their body. However, to do so enough precautions need to be taken so that the viruses or other organisms that inhabit animals are not transferred to humans.

A lot of people carry very deadly genetic diseases in their gene pools and through marriage and the way of sexual reproduction, parents pass those deleterious genes to next generation affecting their innocent children. The children should not deserve this, but they get

copies. There are several significant factors need to be considered to have the exact copy of qualities in the clones in all respects including personality and character, intelligence and talents of which the family and institutional environments are very important. Some people say that it is impossible to recreate John F Kennedy without also equipping him with a domineering father and a dead older brother whose footsteps he was destined to follow. It is not that necessary to clone yourself while you are alive. It can be done even after your death, because you can freeze some of your cells down for future use, and then you can be resurrected. Would you like to be offered another chance at living?

I do not disagree that some bad outputs may come out of human cloning. We never want to see a civilised society to create more copies of evil characters. If the cloning of individuals is a reality, then the military application, for example, is truly frightening. The possibility of a race with superior militaristic capabilities is terrifying. Applications like these must be banned. We should have very rigid national legislations to control the application of this technology in human being.

Yesterday's Science Fiction is Today's Reality

News of Dr Ian Wilmut's experiment resonated worldwide. It immediately reminded people of science fiction tales involving cloned armies, the resurrection of dictators and various quests for immortality. There are several movies centred on cloning as a science fiction of which the *Jurassic Park* got a huge popularity in the world. In

Dhaka Day by Day

Deprived Movie Buffs Rescued!

by Samia Islam



For the movie buffs, Dhaka can be a disappointment. It doesn't have a single multiplex. Even the concept of a multiplex is new here. When 'cinema halls' are taboo for the middle class people, it is hardly surprising that there is a whole generation of us who have grown up without any idea about the magic of big screen. To us, movies mean a 20-inch TV, a VCR with a quirk for conking out in the middle of climax situations, a video cassette that has been thrown hell on wheels, judging from the way it jumps around the place, presenting the scenes amidst a dense pall of smog, or so it seems. And to think that we sat silently all this while and compromised! This is really a weird city, when you take into account our resignation and complacency in matters like this. It's not like people aren't having fun here. Some have LDS set up to reconstruct their own charisma in the confines of a 20" x 12" luxurious den, the stereophonic acoustics creating an apparently exact reproduction of a theatre interior (I). Then we have the other strata of society who are obsessed with PCs. They think that a VCD run on a 14-inch SVGA monitor, cooped up in a corner of the house, with 30 watt speakers and a 46 bit sound card is the salvation for all who have been deprived of the real thing for this long. How any of these could be a suitable substitute for the real McCoy still eludes me. Imagine how much we have domesticated ourselves today, that we have turned an opportunity to hang out with friends and family, to sip a glass of coke and munch potato chips (since pop corn is yet to emerge from the wings as the ideal movie-time snack here), when you go abroad, unlike tourists from other parts of the world, you have to set some time apart to just catch a flick or two in one of those commercially mega ventures, the cinemaplexes. What a waste of

sight-seeing time! It's not like there are no movie theatres in Dhaka or that they don't screen international movies, it's just when it comes to acclaimed A grade movies that they shy away. Otherwise, they are all too willing to screen third rate, soft porns with suspect titles at all hours of the day, round the year. Their defence is that, people who usually frequent these joints cannot appreciate critically superior cinema. Their attitude reminds me of the aged dilemma: *which came first, the chicken or the egg?* Was it third rate movies that drove us away or has our not showing up resulted in the theatres being obliged to switch to porn for survival? Talk like this only ends up depressing me, so lets just look at the bright side, since there is one.

In the absence of the owners taking steps to alleviate the despicable state of their movie theatres, one or two institutions in town have come up with some positive initiatives. Places like the British Council and Goethe Institut have regular screenings of good movies, English as well as other foreign languages. On March 15th, British Council offered a whole day treat of Disney movies for children (adults were sighted in the audience as well, and why not? Disney movies reach beyond the barriers of age). There are a few film societies in the city who arrange retrospectives of renowned international directors at regular intervals. Thanks to the joint initiative of the film societies and the cultural centres of Russia, Germany and Britain, we get to enjoy timeless classics like *Cranes are Flying*, *Sense and Sensibility*, *Ran*, *Much Ado About Nothing* and so many more. It's a laudable endeavour on their part and they deserve to be commended for providing us with family entertain opportunities for family in a comfortable setting, in this no-fun metropolis.

The Daily Star Entertainment Guide

Tuesday 22nd April
(All programmes are in local time. There may be changes in the programmes.)

Those day of Freedom Fighting
10:30 Sur Laharie 11:35
Wednesday's programme summary
11:40 Close down

BTV
3:00 Opening Announcement
Al-Quran Programme Summary
3:10 News in Bangla 3:15 Patriotic songs 3:20 Recitation from the Geeta 3:25 The Album Show 3:50 Cartoon film: 4:15 Unmesh 4:50 Coach 5:00 News in Bangla 5:22 Sangeeta
6:00pm National Television Debate Competition 6:50 Open University 7:00 The News 7:25 Silver Jubilee of Freedom Fighter-A Documentary 8:00 News in Bangla 8:25 Silver Jubilee of Freedom Fighting-Mujibnagar Govt 9:00 Drama Serial: 10:00 The News 10:25

BBC
6:00am BBC World News 6:30 Time Out: Tomorrow's Inc. World Business Report/Asia Today/24 Hours 10:00 BBC World News 10:30 World Focus: Window On Europe 11:00 BBC Newsdesk 12:00 BBC Newsdesk 12:30 Hard Talk 1:00 BBC World News 1:30 World Focus: Window On Europe 2:00 BBC World News 2:30 Time Out: Top Gear 3:00 BBC World News 3:30 Hard Talk 4:00 BBC World News 4:30 Time Out: Tomorrow's Inc. 5:00 BBC Newsdesk 6:00pm BBC News-

CHANNEL V
6:30am The Ticker 7:00 Rewind VJ Sophia 8:00 Frame by Frame 11:00 The Vibe VJ Luke 12:00 Rewind VJ Sophia 1:00 By Demand VJ Trey 2:00 Frame by Frame 2:30 Liberty First Day First Show 3:00 The Indian Top 10 4:00 Frame by Frame 4:30 Big Bang VJ Alessandria 6:00pm Rewind VJ Sophia 7:00 By Demand VJ Trey 8:00 Planet Ruby 9:00 The Vibe 10:00 Liberty First Day First Show 10:30 Soul Curry 11:00 The Ride 12:00am Rewind VJ Sophia 1:00 Highway 2:00 By Demand VJ Trey 3:00 Big Bang VJ Alessandria 4:30 Billboard US Countdown

STAR PLUS
6:30 Ninaad 7:30 Good Mom-



Tiger on Zee TV at 12:00 tonight

STAR MOVIES
7:30am Action: Day Will Dawn 9:30 Action: The Longest Day PG (Arabic Subtitles) 12:30 Documentary: The Directors - John Avildsen 1:30 Romance: Heartbeat 15 (Hindi Subtitles) 3:30 Western: Hannie Caulder 15 (Hindi Subtitles) 5:30 Comedy: Barton Fink 15 (Arabic Subtitles) 7:30 Classic: Mad For Each Other PG (Hindi Subtitles) 9:30 Hollywood One On One 10:00 Action: The Burnout 12:00 Best Of The Boogymen: Wes Craven's New Nightmare 18 (Arabic Subtitles) 2:00 Comedy: Roadside Prophets 18 (Arabic Subtitles) 4:00 Horror: Countess Dracula 18 5:30 Action: Backstreet Justice 15 (Arabic Subtitles)

ZEE TV
6:00 Jagran 6:30 ZED 7:00 ZED 7:30 Index 8:30 Adarnya Pradhan Mantri 9:00 Disney Hour 10:00 Gaane Anjaane 10:30 Lakme Khoobsurat 11:00 Chutki Baja Ke 11:30 Close Up Antakshri 12:00 Chanakya 1:00 Meri Ghar Ana Zindagi 1:30 Siliya 2:00 Hum Paanch 2:30 Tara 3:00 Raahat 3:30 Dhara 4:00 Ka Safar 4:30 Haathi Cement Aashana 4:30 Jhatpat Khana 5:00 Celeste 5:30 Casper Kya Scene Hai 6:00 Aur Ek Minute 6:30 Disney Hour 7:30 Raahat 8:00 Gaane Anjaane 8:30 Nirma Hum Paanch 9:00 Sallaab 9:30 Sapath 10:00 Haastein 10:30 News 11:00 Tara 11:30 Dastan 12:00 TVS Saragama 12:30 Andaz 1:00 Chahat Aur Nafrat 1:30 Raahat 2:00 Shotgun Show 2:30 TMM 4:00 Suhana Safar 4:30 Bournvita Quiz Contest 5:00 Surtaal 5:30 Suno Bhai Sadho

STAR SPORTS
6:30am Watersports World 7:30 India Tour West Indies 5th Test Match Day 5 HL 8:30 Superbike World Championship San Marino Grand Prix Fm Misano Highlights 10:00 Trans World Sport 11:00 Spanish Football League 12:00 Super League Rugby 1:30 India Tour West Indies 5th Test Match Day 5 HL 2:30 Sports India 3:00 Commonwealth Bank Cycling Classic 4:00 The Asian Football Show 5:00 Superbike World Championship San Marino Grand Prix Fm Misano Highlights 7:00 ICC Trophy 1997 1st Semi Final 1:00 World Motorcycle Championships Japan Grand

PTV
8:00am Tilawat Aur Tarjuma-

DD 7
10:30 Janmadin 10:35 Classical Music 11:00 Ghare Baire 11:30 Parliament Hour 12:30 Naba-jarjama (Serial) 1:00 Janmabhumi (Serial) 1:30 Trishna 2:00 Gaan Serial: 2:30 Bakul Katha (Serial) 3:00 Aaleya (Serial) 3:30 Basanta Bi-

SONY ET
8:30am Khoya Khoya Chaand 9:00 The Three Stooges 9:30 Dennis The Menace 10:00 Dream Of Jeannie 10:30 Be-

EL TV
12:30 Hindi Feature Film 2:00 Gulmohar West 2:30 Lumsa Te Chalo Cinema 3:00 Ru-Ba-Ru 3:30 Hey Ha Ha 4:00 HFF(B/W) 7:00 Music Capsules 7:30 Stand By 7:40 Music Capsules 8:00 Haseen Pal 8:40 Teen Do Paanch 9:00 Chehre 9:30 V3+ 10:30 Hindi Feature Film 1:00 Jagur It's My Choice 1:30 S Kamal Kombination 2:00 Gujarati Band 3:00 Raam 3:00 Anurag 4:00 Dard 4:30 ZED 5:00 HFF 7:50 Haseen Pal 8:00 HFF 8:45 Stand By 9:00 HFF

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