

## UNIT 1

# SEPARATING FACTS FROM FICTION

### ***Terms of Discussion***

***Before reading the texts, explain the following notions.***

- genetic engineering
- biotechnology
- sociobiology
- eugenics
- nurture
- acculturation
- megalomania
- infertility
- to be physically identical
- to be genetically superior
- to be behaviourally identical
- in-vitro fertilisation
- test-tube babies

### ***Question Time***

***Using your background knowledge, answer the following questions.***

1. What do you think human cloning means?
2. Is cloning the same as copying?
3. Were people 'twinned' in the past?
4. Is cloning a matter of technology, morality and religion or politics?

### ***Time for Reading***

#### **Breakthrough of the Century**

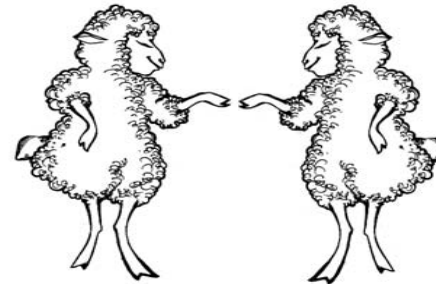
Cloning has always caught the public imagination. We now have the technology to take a few cells from a modern day Einstein, or a musical genius or a child prodigy and to create hundreds of babies which have exactly the same genes. Of course, as identical twins, clones will have individual differences, separate identities — separate souls. However, studies of twins raised apart show remarkable similarities. There is more in our genes than we often realise.

Just think how attractive that could be to some dictator who fancies the idea of watching himself growing up, or dreams of populating the world with a new race of genetically superior people.

Reasons why people want human cloning may be *rational* or *irrational*. A recent U.S. survey conducted by CNN found that 6 per cent of U.S. citizens think human cloning could be quite a good idea. These reasons may vary widely. Here are a few:

- Recover someone who was loved — a twin, a reminder.
- Infertility — why not use a cell of your own to give birth to your own twin?
- Eugenics — an attempt to improve the human race.
- Megalomania — a desire to reproduce one's own qualities.
- Spare parts — using a cell from your own body to duplicate yourself.
- Assisting medical research.
- Just curiosity.

### **Hello, Dolly!**



On February 22, 1997 scientists at the Roslin Institute in Edinburgh, Scotland announced that they had done cloning of a mammal from an adult cell. What does this mean? In general terms, the scientists took a mammary cell from a sheep and put it into an egg. They let this egg grow into an embryo, and then transplanted this fused embryo and put it in a recipient ewe, acting as a surrogate mother. This occurred late in January 1996. This was a crucial day for the cloning world. On July 5 at 4 p.m. Dolly was born in a shed down the road from the institute. The scientist given the credit was a 52-year-old embryologist Dr. Ian Wilmut.

Unfortunately, six years later Dolly passed away, but she remains the "Pioneer Clone".

**For details of Dolly's life and death in the spotlight of public attention see Unit 2.**

## Just Facts

Cloning is a method that involves the production of a group of identical cells or organisms that all derive from a single individual. It is not known when or how cloning humans really became a possibility, but it is known that there are two possible ways that we can clone humans. The first way involves splitting an embryo into several halves and creating many new individuals from that embryo. The second method of cloning a human involves taking cells from an already existing human being and cloning them, in turn creating other individuals that are identical to that particular person. With these two methods almost at our fingertips, we must ask ourselves two very important questions:

*Use a cell from your own body to duplicate yourself.*

### *Can we do this, and should we?*

A *Time* magazine poll reported that 74 per cent of those asked believe it is against God's will to clone human beings. The U.S. President has banned federal funds from being used for human cloning research, stating that, "Any discovery that touches upon human creation is not simply a matter of scientific inquiry, it is a matter of morality and spirituality as well... Each human life is unique, born of a miracle that reaches beyond laboratory science..."

But others argue in favour of continuing human cloning research, of continuing to clone human embryos and perhaps cloning adult humans in the future. Some arguments in favour of human cloning might include the fact that cloned human embryos would make research into genetics and genetically related diseases, and their treatment or prevention, much easier and cheaper. Cloning embryos could also facilitate the process of in-vitro fertilisation, since the collection and replacement of ova is often painful and traumatic, and can be unsuccessful.

Embryo cloning is also seen as a potential treatment for infertility when in-vitro fertilisation is not available, such as when parents are infertile, or when one or both parents has a genome coding for certain undesirable traits or diseases, or if the parents are homosexual couples. Cloned embryonic tissues might be used for the replacement of lost or diseased tissues.

Adult cloning might appeal to those who desire children/adults who are genetically identical to themselves, or genetically identical to someone who they love or admire. There may be many other, personal reasons why

parents would want their children to be genetically identical to someone who is a non-family member. Cloning could provide a genetically identical replacement for a lost loved one.

However, it is important to remember that a genetic clone, although sharing an identical genome with their donor, will not be physically and behaviourally identical to their donor. The clone will only be genetically identical to the donor. Their physical and behavioural characteristics will differ in many important and significant ways.

## The Words of Wisdom

The most commonly cited ethical and moral arguments against human cloning seem to originate from religious perspectives. These religious arguments can even be made by politicians and scientists with religious sympathies. Many religious philosophies teach, for example, that human life is unique and special and should be created, determined and controlled only by their deities. Many religions believe in the existence of, and in the individuality of, a human soul. Many Christians, for example, are concerned about whether it will be possible to clone the human soul, along with the human body.

Not all religious leaders feel the same. In contrast to the opinions of their peers, some Jewish and Muslim religious leaders testified before the National Bioethics Advisory Commission that they feel that embryo and cloning research might provide discoveries that would lead to an appropriate way to counter infertility.

These will be some of the most difficult and interesting questions that need to be decided. Would a cloned human be an individual? Would it really be a human, with a soul? And what if this clone were then cloned again, and again? What would their status and roles be? Other questions and issues include a revitalisation of the "nature/nurture" debate. Will genetically identical people be physically and behaviourally identical, too? Will cloned humans really look exactly alike? Will they have identical personalities? How will clones impact the future of twin studies meant to ferret out the different impacts of genes versus the environment? What will human clones be able to contribute to the perspectives of sociobiology?

The emergence of new technologies creates a new set of cultural events and their consequences with which human cultures must come to terms. Humans must define a status and role for any new technology. This is a process of adaptation and acculturation. In a sense, this is a process whereby humans try to decide what a new technology means to them.

### ***Did You Know?***

#### **Does the word “clone” mean “copy” ?**

It does not. The etymology of the word “clone” is the Greek term “clon” which means “twig”. A twig shares the genetic information of its parent plant, but will not look the same. The word “clone” is often used as “copy”, but one must bear in mind that only the genetic information is copied — the person can never be copied.

#### **Will a clone look exactly like the original?**

Cloning ensures that the genetic material of the offspring will be identical to the original. It does not ensure that the offspring itself will be identical to the original.

Even if the genetic design is the same, surroundings and experience affect personality and lifestyle to such a great degree that in some cases the clone bears little resemblance to the original.

The clone will have different eating habits. He or she will have different tastes in design, music, taste, art and fashion. And since character and personality affect one’s facial expression, the clone is even likely to be distinct in physical appearance.

Twins often resemble each other closely because they not only share genetic information, but also environment and history.



#### **Will my clone and I be interchangeable?**

If you, for example, clone yourself at age 30, there will be a 30-year age difference between yourself and your clone. This alone precludes interchangeability.

#### **What’s the difference between in-vitro fertilisation and cloning?**

In-vitro fertilisation involves taking an egg cell from a female, fertilising it in the laboratory with sperm cells from a male, and thus creating an embryo. Hence the offspring is produced by sexual reproduction (even if no sexual intercourse takes place). The child inherits genetic material from both the mother and the father. In cloning, meanwhile, the child is produced by asexual reproduction. The child inherits genetic material only from the original organism (also known as the “template”).

### ***Did You Get It?***

#### ***I. Answer the following questions.***

1. What is the new biotechnology called ‘cloning’?
2. Why has cloning always caught public imagination?
3. What are the rational reasons for people to want human cloning? What are the irrational ones?
4. What do you know about Dolly the sheep?
5. What is the general public opinion about cloning?
6. What are the most commonly cited moral and ethical arguments against cloning?
7. Do all religious leaders stick to the same opinion about cloning?
8. Will genetic human clones be physically and behaviourally identical to their donors? Why?
9. Why do you think most people are against cloning?

#### ***II. Fill in the gaps with the appropriate words and expressions from the box.***

in the wrong direction; in the news; bizarre; science fiction novels; experience; unbelievable possibilities; bombarded

Cloning humans is an idea that has always been thought of as something that could be found in \_\_\_\_\_, but never as a concept that society could actually \_\_\_\_\_. It is much \_\_\_\_\_. The public has been \_\_\_\_\_ with newspaper articles, magazine stories, books, television shows, and movies as well as cartoons. Much of this information in these sources leads the public \_\_\_\_\_ and makes them wonder how easy it would be for everyone around them to be cloned. \_\_\_\_\_ ideas about cloning lie in many science fiction books and scare the public with their \_\_\_\_\_.

### **Words, Words, Words ...**

#### **I. Explain the meaning of the following words and expressions.**

1. to clone; a clone; cloning; cloning technology
2. a child prodigy
3. identical twins
4. to fancy an idea
5. a surrogate (substitute) mother
6. to be given a credit
7. to be a matter of scientific enquiry
8. a peer
9. to testify
10. to provide a discovery
11. a revitalisation
12. environment
13. to address a goal/need

#### **II. Fill in the gaps with the prepositions from the box and paraphrase the expressions in bold type.**

upon, from, with, beyond, into, to, to, to

1. The new film he is making **touches** \_\_\_\_\_ the problems of young offenders and **appeals** \_\_\_\_\_ human feelings.
2. What country does this custom **originate** \_\_\_\_\_?
3. Millions of people in the world have **access** \_\_\_\_\_ modern technologies.
4. Human civilisation is now facing the necessity of **coming to terms** \_\_\_\_\_ the consequences of new scientific and technological developments.

5. Moral and spiritual issues often **reach far** \_\_\_\_\_ laboratory science.

6. Human cloning, along with **research** \_\_\_\_\_ genetics, will greatly **contribute** \_\_\_\_\_ treatment of genetically related diseases.

#### **III. Give synonyms for the following words.**

- a human being
- traumatic
- to ban
- unsuccessful
- to facilitate
- a disease
- rational
- significant
- crucial
- appropriate

#### **IV. Give the opposites of the following words.**

- moral
- reliable
- legal
- to improve
- painful
- safe
- direct
- significant
- appropriate

### **Means of Discussion**

*Study the phrases below which contain words and expressions used to talk about.*

#### **CAUSE, REASON, PURPOSE and RESULT:**

Cause	Reason and Purpose	Result
<ul style="list-style-type: none"> <li>• <b>Owing to</b> the weather conditions, the flight was delayed.</li> <li>• The delay was <b>due to</b> the weather conditions.</li> <li>• The delay was <b>caused by</b> the weather conditions.</li> <li>• <b>The cause of</b> the delay was a thunderstorm.</li> </ul>	<ul style="list-style-type: none"> <li>• Her <b>reason for</b> not going with us was that she had no money, <i>or</i>:</li> <li>• The <b>reason</b> she didn't go with us <b>was that</b> she had no money. (less formal)</li> <li>• I wonder what his <b>motives</b> were in sending that letter? (purpose)</li> </ul>	<ul style="list-style-type: none"> <li>• He missed a lot of classes. <b>As a result</b> / <b>As a consequence</b> / <b>Consequently</b>, he failed his exams.</li> <li>• <b>The result/consequence</b> of all these changes is that no one is happy any more. (less formal).</li> </ul>

<ul style="list-style-type: none"> <li>• The rise in prices <b>sparked off</b> a lot of political protest. (often used for very strong, perhaps violent, reactions to events).</li> <li>• The President's statement <b>gave rise to / provoked / generated</b> a lot of criticism. (slightly less strong than <b>spark off</b>).</li> <li>• The new law has <b>brought about / led to</b> great changes in education. (often used for political/social change).</li> <li>• This problem <b>stems from</b> the inflation of recent years. (explaining the direct origins of events)</li> <li>• The court-case <b>arose out of</b> allegations made in a newspaper. (the allegations started the process that led to the court-case)</li> </ul>	<ul style="list-style-type: none"> <li>• I wonder what <b>prompted</b> him to send that letter? (reason/cause)</li> <li>• She wrote to the press <b>with the aim of</b> exposing the scandal. (purpose)</li> <li>• I've invited you here <b>with a view to</b> resolving our differences. (a bit more indirect than <b>with the aim of</b>)</li> <li>• He refused to answer <b>on the grounds that</b> his lawyer wasn't there. (reason)</li> <li>• <b>The purpose of</b> their visit was to inspect the equipment.</li> </ul>	<ul style="list-style-type: none"> <li>• His remarks <b>resulted in</b> everyone getting angry.</li> <li>• The events <b>had an outcome</b> that no one could have predicted. (result of a process or events, meetings, discussions, etc.)</li> <li>• The <b>upshot</b> of all these problems was that we had to start again. (less formal than <b>outcome</b>).</li> <li>• When the election results were announced, chaos <b>ensued</b>. (formal)</li> </ul>
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*Now, using these expressions, think of at least 7 sentences of your own, referring to the possible applications and the future of cloning.*

### ***Time to Talk***

*In groups, discuss the following questions, employing the vocabulary of the Unit, as well as CAUSE, REASON, PURPOSE and RESULT phrases.*

1. What are the needs and goals the cloning technology might serve?
2. Who will have access to the technology and its products, for example, will it be only special individuals or classes of people?
3. Who will be benefited, and who will be harmed, indirectly as well as directly, by the implementation of this new technology?
4. What is the best case, and the worst case, scenario if this technology were encouraged?
5. The "nature/nurture" debate: will genetically identical people be physically and behaviourally identical, too?
6. Identity and soul: how do these two notions correlate?

## **UNIT 2**

### **YESTERDAY'S NEVER IS TODAY'S WHY NOT: A GLIMPSE OF HISTORY**

#### ***Terms of Discussion***

*Before reading the texts, explain the meaning of the following words and expressions.*

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|---|---|
| <ul style="list-style-type: none"> <li>• viable</li> <li>• to be 'twinned'</li> <li>• fetal</li> <li>• nuclear transfer</li> <li>• embryo</li> <li>• offspring</li> </ul> | <ul style="list-style-type: none"> <li>• mammals</li> <li>• to breed</li> <li>• ageing</li> <li>• lifespan</li> <li>• genome</li> </ul> |
|---|---|

#### ***Question Time***

*Using your background knowledge, answer the following questions.*

1. Have you ever read any fiction stories or seen any films where the issue of human cloning comes up?
  - a) Retell the plot of one of these stories. What problems do they touch upon?
  - b) Render into English the article "Пока ученые спорят, Голливуд всюю клонирует" from the **Appendix**.
2. What results do people try to obtain by breeding animals? Give examples.