



# Reproductive cloning

## ethical and social issues

January 2004

### Introduction

The publication, in 1997, of the news of 'the first cloned sheep', Dolly, unleashed a media frenzy which immediately focused on the possibility of cloning humans. However, the debate on human cloning began as far back as 1966, when the Nobel Laureate molecular biologist, Joshua Lederberg, published an article about the eugenic advantages of cloning in eliminating unpredictability in reproduction and perpetuating 'superior' genes<sup>1</sup>. In the 1970s, a journalist, David Rorvik, published a book supposedly describing the cloning of a millionaire<sup>2</sup>; although undoubtedly a hoax, the scandal massively boosted sales of the book.

Despite claims by the Raelian cult to have cloned human beings at the end of 2002, there are, so far, no proven human clones. Opinion polls shows that at least 85% of people are strongly opposed to cloning in most countries<sup>3</sup>, yet understanding of the technicalities of cloning is low. This fact, and the sometimes exaggerated or misconceived fears expressed about cloning, has allowed a small, but vocal group of enthusiasts to characterise opposition to cloning as 'Luddism', or a religiously-motivated conservatism. Few bioethicists have come forward with strong arguments against cloning and the US National Bioethics Advisory Committee, for example, was only able to agree that cloning should not be permitted at present, on the grounds of risk to the resulting child, rather than for deeper ethical or social reasons<sup>4</sup>.

The main purpose of this briefing is to examine the arguments for and against reproductive human cloning. We aim to show that there is a very strong case for banning human cloning, but we have tried to present the counter-arguments fairly. We have found that the popular responses to cloning are grounded in very valid concerns, for example, about relationships between human beings and also between humans and nature. Another clear conclusion is that cloning very starkly exemplifies the clash between a liberal worldview, which tends to see all scientific advance as progress, and a more sceptical, conservative attitude, based on traditional beliefs about human nature. This second view is not confined to Christians and political conservatives, and, at least when it comes to cloning, includes the majority of people.

### What is cloning?

Cloning is the creation of almost genetically identical organisms. (For ordinary purposes, clones can be treated as genetically identical to the organisms from which the nuclear DNA is taken. In fact there is a small difference, because the egg also contains a small amount of DNA in mitochondria, small bodies in the main part of the egg. Like organisms produced by sexual reproduction, the clone inherits this DNA only from its mother, not from the nucleus donor. This difference does not affect the ethics of cloning.)

The first step of animal cloning is to obtain eggs, by treating a female with hormones. These eggs are then subjected to nuclear transfer: the nucleus of an egg, containing the mother's DNA, is sucked out using a pipette, and is replaced by the nucleus of a cell from the organism to be copied (see diagram). This is done by placing an adult cell in contact with the egg, and then passing a brief pulse of electric current through the liquid bathing the two cells. The current causes the egg and the adult cell to fuse together, and the resulting embryo to begin its development. The process can theoretically be repeated many times to produce a whole series of genetically identical clones.

In this briefing we use the term 'human cloning' to mean 'reproductive cloning' ie. creating a baby by cloning. This does not include creating embryos for research through cloning, which creates a related but

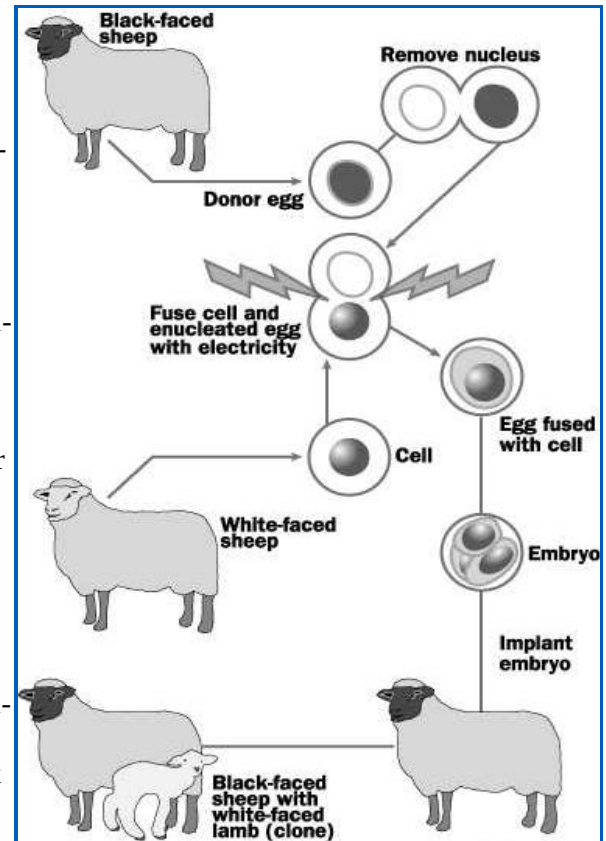
separate set of ethical issues. We use the word 'clone' to refer to the person or organism that results from cloning, and 'clonee' to refer to the person who is genetically copied. A technique that is sometimes seen as cloning is artificial twinning, the separation of the two cells of an embryo that has divided once. In this briefing, cloning refers only to nuclear transfer.

## History and current status of cloning

Contrary to popular belief, Dolly<sup>5</sup> was not the first cloned sheep. Scientists have been cloning sheep, cattle and other animals since the mid-1980s<sup>6</sup>. However, in all these early examples, the source of the donor nucleus was taken from an embryo. Embryonic cells have undergone only a few of the many changes in gene expression (see below) that occur during the development of an adult organism, so it is less surprising that they can be 're-programmed' to go back to the start of the process. Before Dolly, it was believed impossible to re-programme adult cells.

Since Dolly in 1997, using the same or related techniques, scientists have cloned mice, rats, cows, goats, cats, horses and donkeys. While there have been some reports of high efficiency cloning of cows, in most cases the efficiency is still very low. It has not been possible to clone monkeys, dogs or other species.

Since 1998 there have been various reports claiming the creation of cloned human embryos. The first published claims were made by South Korean scientists<sup>7</sup>, whose laboratory was eventually closed down by their government. In 2001, scientists from Advanced Cell Technologies, a US biotechnology firm published the only scientific paper to date on cloned human embryos, only one of which grew as far as six cells<sup>8</sup>. The company said that this research was for research rather than reproductive purposes. There are unsubstantiated claims that Chinese scientists have cloned human embryos, again for research purposes. Since 2000 there have been persistent claims by the Italian IVF expert, Professor Severino Antinori, and the US scientist, Panayiotis Zavos, that they are planning to create cloned babies. At the beginning of 2003, a Canadian-based religious cult, The Raelians, also claimed to have succeeded in creating at least five cloned children<sup>9</sup>, but no proof has been given. It is widely thought that the claims to be doing reproductive cloning are elaborate publicity strategies, similar to those employed by David Rorvik in the 1970s. Reports in 2003 suggest that Ian Wilmut, the scientist who created Dolly, may be about to start creating cloned human embryos for medical research purposes<sup>10</sup>.



**The Cloning Process**

## Is human cloning possible?

The vast majority of embryos created by nuclear transfer do not develop normally: in the case of Dolly the sheep, 277 attempts were necessary. Even after nearly seven years of development of the process in different species, the highest published success rates are around 5% (ie. 5% of the embryos created develop into live animals). In most experiments the rate is less than 1%, and despite many attempts it has not been possible to clone dogs or primates.

Cloned embryos mostly die at the early stages of embryonic development. They may also spontaneously abort after a pregnancy has been established. Even when clones are born, many are abnormal and die shortly after birth, due to a variety of physiological and anatomical problems, which vary from species to species and are not well understood. The most well known of these problems is so-called Large Offspring Syndrome, in which the clones are much larger than normal and often have to be delivered by caesarean section. This condition is similar to Beckwith-Wiedemann Syndrome, a rare human condition which has recently shown to be more common amongst children born through IVF<sup>11</sup>. In fact, many of the other

problems caused by cloning had previously been observed in cattle and sheep IVF, although at a lower rate. This indicates that they are partly due to the general culturing and manipulation of embryos.

The cloned animals that survive are apparently healthy, and are capable of reproducing normally and producing healthy offspring. However, there is evidence that there are subtle problems even in these animals caused by disturbed gene expression (see below). It has been suggested that these are likely to become more evident as the animals age<sup>12</sup>. Dolly, the eldest of the cloned animals, was eventually put down due to a lung tumour at only six years old, but had shown signs of arthritis even earlier. It has been suggested that she may have aged prematurely because she was cloned from a six year old sheep, and may have effectively already been born with DNA that had suffered the effects of six years of life<sup>13</sup>. However, this is unproven.

The main cause of the failure of cloned embryos and the problems observed in clones appears to be disturbances in 'gene expression' rather than direct damage to the DNA. In the normal, extremely complex, process of development of animals from a fertilised egg, thousands of genes must be correctly expressed (ie. DNA must be 'transcribed' into RNA which is then 'translated' to produce a protein which performs the bio-chemical functions of the gene). The expression of different genes is switched on at different stages of development, in different tissues, according to a regulated programme. Each type of tissue has its own characteristic pattern of gene expression, according to which proteins it is required to produce. Thus, when a skin cell nucleus is transferred into an egg it must be re-programmed by the egg cell, so that it can start the developmental gene expression programme from step 1. Until Dolly was born, it was believed that it was impossible to achieve this, and the low success rates of cloning are thought to be due to inadequate reprogramming. A recent study showed that even in apparently healthy cloned mice 4% of genes were incorrectly expressed<sup>14</sup>.

A further problem, which may be the cause of the failure to clone primates from adult cells (although this has been achieved using cells taken from early embryos), involves the process of cell division in primates. Researchers found that removal of the egg nucleus, prior to injection of the adult cell disrupted subsequent cell division, so embryos were unable to develop<sup>15</sup>.

It is unclear whether it will ever be technically feasible to clone humans. The persistent low success rate with animals, despite much effort to modify the procedures, and the failure to clone primates, suggest that it will be extremely difficult. On the other hand, advocates of cloning have pointed out that IVF was achieved in humans more easily than in other species. Although there have not been enough studies yet of long-term, subtle, health problems in IVF children, it is clear that IVF is safer in humans than animals. These advocates suggest that the main problem is the conditions under which embryos are cultured, and that the extensive experience with human IVF will make human cloning easier. Yet the root of the biological problems with cloning is much deeper than with IVF and surely will not be solved simply by improving culture conditions. Although some people believe that there are probably already human clones, made in secret, it is very unlikely that this is the case.

It is the safety problems associated with cloning that currently form the basis of official prohibitions on cloning. Furthermore, the limited success that has been achieved has involved modification of the procedure for each species, involving the use of many animals. To do this with humans would be highly unethical: it would involve the production of hundreds of eggs for research, involving treating women with hormones which are far from risk-free, and would also result in many miscarriages. No matter how good the preliminary animal evidence may become, the first attempts at human cloning will always be highly experimental. On the other hand, in the field of reproductive technology, new techniques are often used with very little evidence of their safety. These attempts are justified, as Professor Antinori has done, by arguing that there is a moral imperative to help couples desperate for a child, and who are prepared to run big risks. For those committed to cloning, unless the safety concern is enforced by law, it is not a major deterrent. It is therefore necessary to examine arguments about whether cloning is intrinsically ethically acceptable, however safe it may be.

## **Ethical arguments and popular responses to cloning**

Cloning has given rise to a massive ethical debate, including reports by bioethics committees and many books and articles. Due to lack of space, we have not attempted here to discuss the religious arguments

about cloning, but the bibliography provides some references on this.

There are few enthusiastic advocates of cloning, but a number of bioethicists have tried to show that popular responses, and even the more sophisticated philosophical arguments against cloning are naïve, and cannot be sustained. These commentators have argued that people's opposition to cloning is a 'yuk reaction', which cannot stand up to reasoned argument. In a similar, defensive way, liberals have argued that while cloning may not be very desirable, we should not stop other people from doing it, because that would interfere with freedom. In this section, we will examine some of the key ethical arguments and popular responses, such as those about 'playing God'. We will try to show that popular responses, although they are sometimes overstated, are valid and are based on defending important values.

## **'Cloning is unnatural'**

Most people, when asked why they oppose cloning, would at some point, remark that cloning is 'unnatural'. However, this means different things to different people. Here we examine three different concerns: that cloning shows lack of respect for the complexity of nature; that it typifies the industrial imposition of uniformity on nature; and that by radically altering the biological basis of human nature, it will damage individuals and society.

### *Science and nature in the real world*

It is certainly true in a literal sense that cloning is unnatural. Previous medical and technological interventions in human reproduction included segregation of the sexes and sterilisation in the period of state eugenics; family planning and artificial insemination in the 1940s and 50s; legalised abortion, contraception, medicalisation of pregnancy and birth in the 1960s and 70s (including ultrasound screening for Down's Syndrome and Spina Bifida); and IVF and related 'assisted reproduction technologies' including pre-implantation genetic diagnosis and surrogacy in the 1980s and 90s.

Cloning differs decisively from these earlier interventions in reproduction, which work with, and overcome blocks to, natural sexual reproduction: cloning forces something that never happens naturally, and thereby invents a form of reproduction which is entirely unnatural for humans, ie. asexual reproduction. The gradual development of technology (often represented as a slippery slope), is hard to resist, except when it produces something clearly different from what has gone before. Cloning is such a point, which is one reason why it generates such strong feelings and has become such a high profile political issue.

However, the complaint about the unnaturalness of cloning means more than simply that asexual reproduction is unnatural. It appeals to a set of moral and social meanings, which can be strongly contested. There is often an assumption that the natural is wholesome and good, and the artificial is inferior. Some religious philosophies hold that it is wrong to interfere in God's creation. In general, the term 'unnatural' has strong negative meanings. Liberals point out that such naïve positions cannot be sustained. For example, everything in modern, Western societies, including medicine, is, in some sense, unnatural, yet few people would be prepared to forego the benefits of our technology. Conversely, many things happen in the natural world that humans find very unpleasant. Furthermore, as the liberals rightly point out, there is no necessary connection between the natural state of things and moral rightness and wrongness. At this point the argument usually ends with the liberals claiming victory, and concluding that there are no valid reasons why we should not manipulate nature as we see fit.

Yet while liberals generally dismiss those concerned about unnaturalness as naïve romantics, in fact the same charge can be levelled at them. Although it may be true that the unnatural is not necessarily bad, negative reactions to technology are based on experience of certain persistent characteristics of the unnatural, in the real world and in particular, of the role of science in Western capitalist societies. The fundamental basis of modern Western societies is the use of science and technology to control nature for human benefit, and to extract profit from it. This ongoing development is defined in our societies as progress, and the medicalisation and technologisation of human reproduction are part of this process.

While the control of nature has brought great material improvements in the quality of human life, one problem with it is that we often have little understanding of the complexities of natural systems, and little respect for the reasons that they operate in the ways that they do. Because the direction of science is often

driven primarily by economic incentives, there is often little wisdom in the way it is applied. The physiological problems with cloned animals would seem to be just the latest in the long list of examples of the unwisdom of profit-driven science. Over millions of years, the processes of reproduction in mammals have been finely tuned by natural selection, and the result is a highly complex and integrated process appropriate to mammals, which cannot easily be radically tampered with. Thus it is not surprising that problems arise when scientists force nature down paths that are radically different from its own. The problem is not merely that cloning is unnatural, but that it typifies the problems that arise from the the blind drive to overcome natural barriers.

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## ***Cloning exemplifies the worst ways in which we control nature***

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### ***Uniformity and individuality***

There is a deeper concern about how the scientific control of nature produces not merely accidental problems, but systematic ones, which is strongly exemplified by cloning. In our industrialised society, the control of nature through science tends to mould nature and natural processes according to the criteria of industrial production. Whereas nature generally maximises diversity and rarely allows one type to dominate, industrial systems aim at maximum production efficiency of a single product and insist on quality control and a high degree of uniformity. A typical example is industrial agriculture, in which farmers use a restricted number of crop varieties, which must be genetically highly uniform. The creation of uniformity is seen most literally with cloning, which has the potential to produce many genetically identical animals. The following passage, from a practitioner of farm animal cloning neatly summarises the appeal of cloning in factory farming of animals. Referring to cows, he says:

“... they should command a premium at each step of the way because the feedlot operator would know, 1) that this clonal line performs best on this ration, 2) that this clonal line will be ready for slaughter after X number of days in the feedlot, and 3) that the packing plant will pay a premium for these animals because they are assured of a known uniform product. In the end the consumer will benefit with a more uniform product.<sup>16</sup>”

The overtones of enthusiasm for the regimentation of nature, driven by economic imperatives, in this passage are chilling; the public concern about the unnaturalness of cloning is partly about applying the same drive towards uniformity, to human beings. This is often symbolically expressed in horror scenarios of cloned soldiers, designed to have the faceless uniformity that is demanded in military control systems. Thus, a key focus of the debate about the ethics of cloning is about individuality and human freedom. Whereas natural sexual reproduction results in newness, variation, unpredictability and uniqueness, cloning produces uniformity, predictability and control. The production of humans by cloning thus offends against our deepest values, such as the importance of individuality. Below, we discuss how literally we can say that cloning undermines individuality.

### ***Cloning and human nature***

The possibility of human cloning also raises, in a very radical way, old and very fundamental questions about human nature. Is human nature relatively fixed by biology, or can we adapt to new and different ways of reproduction and family arrangements without damaging ourselves? Each new development in reproductive technology has raised this question, which has tended to be manifested in a ‘moral debate’ about sexuality, the family and society. This argument, which pits religious conservatives against a progressive lobby of liberals, (most) feminists and scientists and doctors, periodically erupts onto national political agendas.

Conservatives tend to argue that biology dictates kinship patterns, and that these are part of the fundamental basis of human nature. Cloning certainly radically disrupts kinship patterns and conventional relationships between biological and social parenthood. For example, an adult parenting a clone of him/herself is parenting his/her genetic twin, and it is not difficult to see how this could lead to psychological difficulties for both parent and child. The American bioethicist, Leon Kass argues that the social identities of parent and child, and the relationships between, them are created by and grounded in the



rules of natural sexual reproduction, and in the genetic relationships that it produces<sup>18</sup>. He sees the biological grounding as essential to give individuals clear identities, as to which family they belong to, and to ensure the love and protection of children by their parents. Kass argues that cloning fits perfectly within existing social trends of separation of sex from reproduction, of atomisation of the family, of individualism (verging into narcissism), and of consumerism: 'The clone is the ultimate single-parent child'.

Of course, such arguments have long been used by conservatives in the ongoing debates about trends in family structure, and their social consequences. Liberals tend to respond by asserting the importance of love in creating 'families of choice', and insisting that many different kinds of families can work well. Using similar arguments to those about IVF, the defenders of cloning argue that infertile parents who have had to expend great effort and expense to produce a child will love it all the more.

Some bioethicists, such as Joseph Fletcher, who view the essence of human nature to be to manipulate nature through technology go further. Fletcher argues that artificial and eugenically controlled reproduction (including cloning is superior to and 'more human' than natural reproduction<sup>19</sup>. Likewise, some of the more enthusiastic cloning advocates even claim that a more rationally and scientifically controlled, planned parenthood, is superior to natural reproduction and is likely to produce better parent-child relationships<sup>20</sup>. Such liberals tend to deny the concept of a fixed human nature or human condition based on either biology or anthropology. For these commentators, if there is any human nature it is to be self-creating, rational species with no fixed limits<sup>21</sup>. It is not difficult to see how this ideology can be used to legitimate the ongoing project of rationalisation of nature, including human nature, and to reject the idea of natural limits to such a process.

We cannot, in this briefing, deal properly with the deep issues about whether there is a biologically-based and relatively fixed core of human nature, which is common to different societies and historical periods. However it is important to note that it is not necessary to accept either pole of the argument. Human nature may not be fixed by biology, but that does not mean that humans are infinitely malleable and manipulable. Likewise, although we do not have to accept the conservative insistence on biologically determined kinship patterns, or on heterosexuality, marriage and the nuclear family, cloning does force us to notice that not all biological arrangements are equally good. Although it is difficult to prove through argument, it is hard to escape the feeling that the unnaturalness of asexual reproduction goes one step too far in the rearrangement of the family, and of the human psyche.

## Clones, Twins and 'Playing God'

In the previous section we noted that cloning raises fears about uniformity. But, even though they are genetically the same, how similar will clones really be in appearance and behaviour? Two related arguments, are often made against the popular repugnance about cloning. Firstly, it is pointed out that cloning is not like Xeroxing a person - a clone of David Beckham would be a baby with David Beckham's DNA. Since our behaviour, likes, talents, etc. are determined at least as much by our environment and life experiences as by our genes, a clone will not be the same as the person from whom they were cloned<sup>22,23</sup>. A clone of David Beckham might grow up hating football, or be a bad player - he would certainly be a unique individual. For its liberal defenders, cloning presents no threat to individuality and freedom because genes and biological origins are essentially irrelevant. Indeed, for liberals, emphasising the importance of genes and biology immediately smacks of prejudice and right-wing politics. According to this view, we are who we make ourselves, and cannot be controlled through our genes.

It is clearly true that some of the popular horror of cloning is based on genetic determinism, which assumes that clones will be simple copies of the original and identical to each other in all aspects. There is plenty of evidence from animal cloning that this is not the case. On the other hand, liberals traditionally tend to over-emphasise the importance of environment and downplay the role of genes. Identical twins show us that genes really do matter, for example, in many aspects of appearance, which in turn influence the way the world treats us. Whilst overblown claims are often made for genetics, there is a considerable amount of data which now supports a significant role of genes in many characteristics. So, while clones of David Beckham may not turn out to be footballers, they are much more likely to do so than clones of Luciano Pavarotti.

Moreover, in many cases, the reasons given for cloning are all about wanting to replicate a **particular** set

of genes, in the hope that this will produce a person very similar to the original. The egotistical self-cloner, the cloner who wants the best (already tried and tested) set of genes for their child (perhaps a famous person) or the parent who wants to 'replace' a dead child are all very concerned to control the future characteristics of the child, by controlling their genes.

A second argument notes that 'identical' or 'monozygotic' twins (i.e. twins that arise from the splitting on a single embryo at an early stage) are genetically identical 'natural clones'. Yet on the whole, people feel comfortable with the existence of such twins, and do not see them as an ethical problem or a threat to society. 'Identical' twins are often very different in personality, and demand the right to be treated as individuals. Since we do not see identical twins, or the existence of genetic identity as a problem, what can be the problem in artificially creating the 'identical twin of' a parent, through cloning? It is sometimes argued by opponents of cloning that a reason for not permitting it is that cloned children would be discriminated against; the defenders of cloning rightly reply that this is not a valid argument, and in any case may be untrue – IVF babies are now routine and widely accepted. We should not allow our concern about cloning to translate into prejudice against the innocent individuals who result from it.

The key point here is that there are crucial differences between 'identical' twins and clones of a parent. When we clone an existing person, we already know a lot about how the genetic endowment of the new embryo will play out. Unlike twins, we are repeating something that already exists, not allowing nature to create something new and beyond our control, through random sexual reproduction. Nonetheless, the comparison between clones and twins highlights something important: that the problem is not genetic identity per se, but its imposition under human control: the problem is not clones, but cloning.

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## *The problem is not clones, but cloning*

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### *'Playing God'*

The public concern about cloning is sometimes expressed in the phrase 'playing God'. There are a variety of meanings to this expression, some of which are very similar to the concerns about controlling nature discussed in the last section. There are also the theological meanings concerning the usurping of God's role. Here we are mainly concerned with the effect that controlling our children's genes would have on our ethical relationship with them. In cloning we would exert total control over another person's entire genome, and eliminate the random mixing of genes that takes place in sexual reproduction. Although we would not actually genetically 'design' them, we would have far greater control over how they turn out than even a genetic engineer, who adds a few genes to the thousands of randomly assorted genes in a sexually-conceived embryo. Leon Kass argues that cloning 'personifies our desire to fully control the future, whilst being subjected to no controls ourselves'<sup>18</sup>. Kass argues convincingly that the genetic novelty and uniqueness that results from sexual reproduction is a crucially important aspect of being human. The fact that we are new, uncontrolled, unknown and different from anyone who has gone before commands respects and equal treatment: it compels others to take us for what we are and not imagine they have the measure of us. Fundamental to our ethical status as persons is our creation as 'other' but equal to all other human beings. The Danish Council of Ethics puts the point clearly:

'The need to forbid the possibility of reproduction through cloning exists because the actual notion of cloning also revolves around our attitude to that which is radically different to the other person, to the Other, and to nature as the Other. The desire for cloning cannot be divorced from the desire to invalidate the different, the other, the alien – that which is at variance with us, differs and never slots neatly into our all-purpose pigeonholes.'<sup>24</sup>

Exercising control over our offspring's genes inevitably affects the ethical relationship between the cloner and the clone. In doing so, we would place ourselves very much in the position of God, on a level above the clone, who would become much like any designed consumer product. The relationship between cloner and clone would become a designer-object relationship, rather than an equal relationship between human subjects. This objectification would be a logical outcome of a reproduction which had become like an industrial production process.

This may seem an abstract argument and, of course, in theory, cloned humans should be treated as persons like any other, with full human rights. Yet it is perhaps not surprising that many people feel that clones would be something less than full human beings. In religious terms, it is sometimes suggested that, not 'being born of man and woman', clones would lack a soul. This perception is encouraged by scenarios of using clones as the source of organs for transplantation, when the clonee becomes sick or ages. This view of clones as things rather than people is understandable, given the objectification inherent in the way they come into being.

## **The welfare of cloned children**

The most immediate problem for clones is the way they will be treated, and the impact of being a clone upon their psychological development. As often happens with identical twins, it seems likely that cloning parents will tend to reinforce the genetic sameness, in the way they treat the child. This is especially obvious with the egomaniac self-cloner, but is likely to be a part of the behaviour of all cloning parents. It is sometimes argued that all parents manipulate their children's development, yet we do not legislate against it. Two wrongs, however, do not make a right. Moreover, the tendency seems likely to be considerably more pronounced with clones. The very fact of objectifying a person in this way, and of placing oneself in the position of designer, will tend to encourage it. Where ordinary parents have hopes, cloners will have expectations; and the child will quickly pick up what is expected of him. Clones will grow up knowing (or thinking they know) a great deal more about their future than other children (including twins), and this will restrict their feeling of having an open future<sup>25</sup>. They may find it hard to feel that they are truly their own person.

While very real, these concerns are hard to evaluate. Cloning would interfere with fundamental aspects of the human condition: kinship relationships, genetic uniqueness and subjecthood. Twins often have psychological challenges, but they do not have to cope with the added difficulties of radically disturbed kinship, and being a designed object. However, human psychology is complex and experience has taught that people can make the best of many kinds of bad job. We cannot predict exactly how the parents of clones will behave. Concerns about psychology and welfare may not, therefore, be a decisive objection to human cloning. However, we can surely say that this is a very bad job to have to make the best of. British law requires the regulator to consider the welfare of the child in deciding whether to permit the use of reproductive technologies and it seems unlikely that cloning would pass this test.

## **Cloning for infertility treatment and other scenarios**

The more persuasive advocates of cloning suggest that even if it is technically feasible and is permitted, cloning is unlikely to ever become a widely used procedure. They suggest it would be a rather specialised procedure for couples who produce either no sperm or no eggs, and who wish to have a child that is genetically related to at least one of them and avoid the use of sperm or egg donors. It is argued that most people will continue to reproduce sexually, since this is much easier, cheaper and more fun. Therefore, they say, we need not deny the procedure to the few couples who need it.

Although it is likely that in the short term, cloning would be a minority pursuit, in the medium- and long-term demand could be considerable. Firstly, according to the claims of the Raelians and Professors Zavos and Antinori, there are already hundreds of couples prepared to pay \$1-200,000 in order to be cloned; in the Raelian case, no pretence is made that these are all infertile. As Kass notes, cloning fits perfectly with existing social trends, and we are likely to see an intensification of the trend to separate sex from reproduction. Middle class parents will increasingly be looking for a reliable form of reproduction, which gives their children the best possible genetic start in life. Given the existing market in the USA for (eugenically)'superior' donor eggs and sperm, it does not seem unlikely that a market for cloned embryos from 'superior' individuals would develop – cloning has always attracted the eugenically-minded. Providers of such services would be able to claim an advantage over the sperm and egg market: their embryos have an already-known high IQ, fitness, etc. For this reason cloning, if technically feasible, may be more suited to a mass consumer market than scenarios involving selection or genetic engineering of sexually produced embryos. As Barbara Katz Rothman says:

'Cloning is about control. It's about introducing predictability into the wildly unpredictable crapshoot



that is life. If normal procreation is the roll of a hundred thousand dice, a random dip in the gene pool, cloning is a carefully placed order. ... it is *order* both in the sense of predictability and control, and in the sense of the market, an order placed, a human being on order. In a perfect world, we could think about the value of the first form of order, the value of predictability and control in procreation without thinking about the second form of order, the power of the market. In our world, the two are hopelessly, endlessly entangled.<sup>26</sup>

The quote on page 5 is a good example of this entanglement. If a market in cloning were to develop, it would require a huge supply of eggs, which would most likely come from poor women, in the same way that such women are already exploited in the US surrogacy market. These women would have to undergo the risks associated with hormone treatments.

Having said this, the question of cloning for the rare cases of infertility needs to be addressed. The questions that should be asked are: does the relief of infertility justify the use of any safe technique, no matter what the consequences for the children produced, or for society as a whole? And must we submit to the wishes of such parents concerning being 100% genetically related to their children? Must we suffer all the ethical and social consequences of cloning for the sake of these desires? In HGA's view, the answer to these questions is no. Any bioethics worthy of the name must be able to insist that relief of suffering does not justify *any* means.

A final scenario that is widely discussed, is of the couple who wish to clone a dead child (or even a parent or grandparent). One can sympathise with the desperate wish to turn back the clock and start again, and many parents in such a situation would want to have another child. But the suggestion that one might do so through cloning, in order to get the 'same' child back is very disturbing. It illustrates how we are beginning to see human beings as customised products, and are therefore unable to accept the difference between the humans and products: that humans are unique, irreplaceable and die, whilst products can be replaced if they break or get lost. Despite greater or lesser efforts to the contrary, parents would surely tend to treat the cloned child as a 'replacement', rather than as a new individual. The cloned child would forever live in the shadow of, and be compared to the beloved, idealised in memory, dead child.

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***The relief of suffering does not justify the use of any means***

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## **Reproductive liberty**

Liberals often argue, especially in the USA, that the concept of 'reproductive rights' implies that people have a 'right to reproduce in any way they want'. This is reinforced by a strong belief that the state has no role to play in personal matters such as reproduction. Thus, it is argued that we should not ban cloning, because this will infringe on basic freedoms. Although these arguments might seem plausible, they are in our view an extremely dangerous attempt to extend the meaning of much more narrowly-drawn rights, such as abortion rights. In essence, what is happening here is the elevation of one ethical value - personal autonomy - above all others. A right is the strongest type of claim, one which other considerations cannot outweigh. The danger of expanding 'reproductive rights' in this way is that we abolish the weighing of competing ethical values (such as the welfare of the child and the effect on society at large) in any particular issue.

This expansion of narrowly-drawn reproductive rights is increasingly being used to justify a free-market eugenics, based on consumer choice in reproduction<sup>27</sup>. The pitfalls of this approach are discussed in more detail in HGA's briefing on sex selection<sup>28</sup>. In brief, while there is a 'negative right' of non-interference by the state in one's right to 'marry and found a family', as the Universal Declaration of Human Rights puts it, that is a very different thing from asserting a positive right of access to any technological means necessary to have a child. Likewise, although abortion rights protect women's vital personal control over their own bodies, this does not imply a right to take control over the child's characteristics. There is no right to use a particular reproductive method, simply because one happens to want to, and no matter what the consequences for the child or for society. We cannot pretend that reproduction exists in some inviolable private bubble immune from normal considerations – it has always been a highly social activity, subject to innumerable social and cultural constraints, some of which, such as restrictions on who we can marry, are the subject of legislation.

## The ethics of cloning: some conclusions

In HGA's view, the arguments against human cloning are compelling. We have tried to show that popular revulsion at cloning and the arguments about naturalness and 'playing God' are based on valid concerns. It is not that cloning is bad because it is unnatural, but that cloning is an example of some of the worst aspects of *the way that* we control nature in Western societies. Cloning shows very clearly the lack of respect for natural complexity. It also exemplifies the way our industrial systems impose uniformity and turn everything, even human beings, into mere objects. Although it is hard to prove, the drive to overcome natural constraints to the manipulation of human nature seems likely to produce damaged individuals. The problem is that the very paradigm of control of nature, which is fundamental to our society, is, when applied to human beings, inimical to personhood, freedom and individuality. Although the term has often been criticised as vague and meaningless, we believe it is valid to say that cloning offends against human dignity, or, in other words, that it is a form of dehumanisation. Although human nature may not be a fixed entity, there are some natural limits that science should not try to overcome.

We do not believe that the arguments for reproductive liberty or allowing cloning to treat infertility are important enough to overcome these concerns. That the proponents of liberty are prepared to allow even human cloning is a sign that they are driven by political dogma, rather than balanced ethical reflection. **We believe that the harm to individuals and society that would come from permitting human cloning are important enough to justify a ban.**

We have also emphasised the way that liberal thinking tends to justify the continual increase of technological penetration of nature and to accept no biological limits to manipulation. Against the popular and conservative protest at the hubris of scientists, liberals argue that their opponents are equally guilty of hubris, by seeking to restrain technological and medical progress, in the name of religious and outdated concepts of human nature<sup>29</sup>. We have tried to show that there is a third way in this debate, which recognises the problems created by the idea of unrestricted freedom to manipulate nature, without falling into fixed, conservative concepts of human nature.

## Political and legal responses to cloning

The huge furore surrounding the announcement of Dolly the sheep led to unusually rapid political action in some countries (it is not common for states to impose outright bans on scientific techniques). US President Clinton immediately imposed a ban on the use of US federal funds for research involving reproductive cloning. In a few countries, including Britain (see below) there was already legislation on cloning prompted by earlier cloning of sheep and cattle in the 1980s, and by debates stretching back to the 1960s.

The loudest organised voices calling for a ban on reproductive cloning have come from Christian churches. Unusually, their calls have been echoed by the scientific community, which in the last two years has made increasingly clear and united calls for a ban on reproductive cloning, through its InterAcademy Panel<sup>30</sup> representing national academies of science in many countries. Biotechnology industry groups have also supported this position. There are, no doubt, many scientists who share Ian Wilmut's personal feelings of repugnance for the idea of reproductive cloning; however, it is clear that the scientific establishment's moves are also politically motivated. Few scientists are interested in researching reproductive cloning; but there are political gains to be made, especially at a time when scientists are being criticised over issues such as GMOs, in being seen to support the banning of something at the ethical margins. Critics have also noted that one effect of banning reproductive cloning in isolation is to implicitly legitimate other activities, such as embryo research, prenatal selection and even human genetics engineering. HGA shares this concern: in our view an international ban on cloning should be part of a genuine ongoing process to establish international controls over reproductive and genetic technologies and their use.

The major factor complicating progress towards a global ban on reproductive cloning is interference from the debate on embryonic stem cell research and so called 'therapeutic cloning'. One year after the Dolly announcement, US scientists announced the isolation of human embryonic stem (ES) cells, and speculation immediately focused on the scenario of 'therapeutic cloning' - the possibility of cloning cells from a patient, followed by the extraction of ES cells from the embryo, in order to produce tissues for transplant back into the patient. In this scenario, the role of cloning is to ensure that the tissues created are genetically identical to that of the patient, and so will not be rejected by him/her.

On this issue, religious and scientific lobbies have been on opposite sides. For the Christian and pro-life lobbies, this idea is worse than reproductive cloning, because it involves the deliberate creation of human life in order to destroy it. Reproductive cloning, although objectionable in many aspects to Christians, would also create a human life, and some Christians have therefore argued that it would be better to implant a cloned embryo than to destroy it. Scientists, biotechnology / pharmaceutical companies and patient groups have, by contrast, focused on the potential medical benefits of 'therapeutic cloning', which, in their view, outweigh the destruction of embryos. Scientists' groups have been particularly opposed to restriction of their freedom to research. They have therefore argued against the ban on all forms of cloning that has been proposed by pro-life groups.

In HGA's view, it is increasingly clear that although ES cell research may be useful, the idea of 'therapeutic cloning' is not feasible as a regular medical treatment for many reasons. Cloning uses many eggs, which are simply not available: to attempt to do this would involve submitting millions of women to risky hormone treatments. There are alternative solutions to the immune recognition issue, which are being actively researched. Thus cloning is essentially irrelevant to ES research, although the issues have become unfortunately inseparable in the public debate. Secondly, developing and publishing techniques for creating cloned human embryos risks the use of the techniques for reproductive cloning. We have therefore advocated a moratorium on cloning of embryos for research, at the very least until there is an international ban on reproductive cloning. For more detail on these issues, see HGA's briefing on 'therapeutic cloning'<sup>31</sup>.

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### *45 countries have banned reproductive cloning*

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The political debate on 'therapeutic cloning' has been particularly polarised in the USA, where, despite the presence of Republican majorities in both houses of the US congress for the past two years, and a consensus across the political spectrum that reproductive cloning should be banned, no legislation has been passed. The same problems have frustrated efforts at the UN level for a global ban on reproductive cloning; the pro-life Bush administration has led the group of countries calling for a UN ban on all forms of cloning, whilst Britain has led the countries insisting on a ban on reproductive cloning only. In the latest vote in December 2003, 64 countries supported the US position and 23 supported Britain. It was finally decided to postpone discussion until 2005.

In the UK, reproductive cloning was banned at the end of 2001. However, due to loopholes in the wording of the HFE Act, 'therapeutic cloning' would be legal. Internationally, as of October 2003, 45 countries have banned reproductive cloning<sup>32</sup>. The majority of these countries are in Europe, and are covered by a protocol to the Council of Europe's Convention on Biomedicine and Human Rights. In Latin America eight countries have banned reproductive cloning, as have seven Asian countries. Of these, the most significant is China, which has often been reported to be pursuing reproductive cloning. The Chinese government issued a decree banning cloning in October 2003<sup>33</sup>. In Africa, only South Africa has legislation banning cloning.

**In HGA's view, cloning should be banned internationally. It is extremely unfortunate that the split on 'therapeutic cloning' is impeding progress towards a global ban. We hope that the international community can resolve this difficulty swiftly.**

In the public discussion on cloning, it is often suggested that there is some inevitability about cloning, and that attempts to ban it are futile. This is usually based on the idea that 'you can't stop science', or that nations cannot prevent the actions of maverick 'mad scientists'. It is even argued that since cloning is 'inevitable' it is better to regulate it in industrialised countries than to allow its unsafe development in countries which have no legislation.

Although these arguments are usually presented as being based on realism, we believe they are naïve. In fact, science is anything but a juggernaut, proceeding inexorably according to its own internal logic, in a social vacuum. The agenda of scientific research is driven by many social factors, especially economic competition. Above all, science, needs funding. Since, as we have shown, there are great technical difficulties in human cloning, it makes sense to prohibit funding for research on reproductive cloning, as the EU has done with its funding programmes. If funding for cloning dries up, and leading scientists avoid the area, there is no certainty that cloning will ever be achieved.

As for the maverick scientist and their wealthy funders, it is possible that cloning events will take place before there is a global ban, with severe penalties attached. In our view, they will not, because the technical difficulties will delay success until after a ban is passed. But even if this is wrong, there is a major difference between a world in which an isolated cloning event occurs, triggering a global ban, and one in which cloning becomes an accepted economic activity. A global ban should be accompanied by funding to help poor countries enforce it. Although a small black market might nonetheless develop, we believe that it is still worthwhile to ban undesirable activities, and to prevent an open market in cloned embryos.

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