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Human Cloning: A Watershed for Science and Ethics?

The possibility that human beings will be cloned elicits widespread opprobrium from a wide spectrum of the population, Christians included, so much so that calls for its banning are frequently heard. The reasons for the strength of this opposition are profound and serious. They are based on the arguments that cloning: will imperil human dignity, represents a technological manipulation of human reproduction, will harm the resulting child, involves experimentation on human embryos, represents excessive human control, and is antagonistic to Christian aspirations. In assessing these arguments, concern is expressed with the assertions that cloning will inevitably lead to the instrumentalisation of human beings, that clones will be forced to walk in the footsteps of others, that their lack of genetic uniqueness will lead to a lack of human uniqueness, and that clones will invariably be treated as a product and not as a gift. The important role of control in human affairs is explored, with its repercussions for genetic control. While these criticisms do not lead to advocacy of human cloning, they encourage us to revisit the principles needed to guide us in our relationship to all aspects of God's world.

Keywords: human cloning, human dignity, human reproduction, manipulation, human embryos.

The pedigree of cloning

If there is one subject assured of eliciting almost universal opprobrium it is the possible cloning of human beings. Surely, then, there is neither need nor room for debate, since the outcome is self-evident. For many, human cloning¹ is the one act no civilized, let alone God-fearing, society would contemplate. Its prospect, let alone implementation, is too horrific to imagine. Were scientists ever to indulge in such a project, they would have overstepped the bounds of their legitimate territory, and would have brought the whole of the scientific enterprise into disrepute. The strength of negative views on human cloning is remarkable, coming as they do from governments, scientific bodies, interest groups and individuals of enormously diverse persuasions. The driving force

1 In this article 'human cloning' is used to refer to 'human reproductive cloning', that is, the asexual reproduction of an individual. This is somatic cell nuclear transfer (SCNT) where the cloned embryo is placed in a woman's uterus for development to term. I am not dealing with 'human therapeutic cloning', where the cloned embryo is used for research purposes (and possible therapeutic purposes in the future), by serving as a source of tissues. This latter form of cloning is frequently considered in association with the production of stem cells.

behind this majority stance is that in some way human cloning would imperil human dignity, both of the clones themselves, and of the human race as a whole.

For most people the current debate on human cloning commenced in February 1997 with the intense and highly emotive publicity surrounding the publication of a now famous (to some, infamous) paper in the science journal *Nature*.² This reported the birth of the first mammal cloned from a cell of an adult animal, as opposed to a cell from an embryo. The birth of Dolly the sheep was an example of cloning by transfer of genomic DNA, with its demonstration that the nuclear material of an adult cell can be reprogrammed and that a mature mammalian cell has the capacity to regain totipotency. For developmental biologists this was a feat of immense scientific significance, overturning as it did a fundamental dogma, namely, “the cloning of mammals by simple nuclear transfer is biologically impossible.”³

The reality, of course, is that the interest in cloning did not commence in 1997. Its history is a long and circuitous one, commencing in the late nineteenth century and involving many of the well-known figures in embryology and developmental biology. These included Hans Driesch, Hans Spemann, Jacques Loeb, Robert Briggs, Thomas J. King, and John Gurdon (who successfully cloned amphibia). Closer to the present time, we meet Karl Illmensee, Peter Hoppe, and Steen Willadsen, before Ian Wilmut, Keith Campbell and their colleagues burst on to the scene in the 1990s.⁴

Likewise, ethical and social debate on human cloning has been ongoing for at least the past 40 years. Initial debate can be traced to the 1960s when J.B.S. Haldane and Joshua Lederberg⁵ were speculating on uses of cloning in social engineering and evolutionary terms. While these speculations were more akin to science fiction than scientific reality, they elicited serious responses from two contrasting theologians – Paul Ramsey⁶ and Joseph Fletcher.⁷ The divergent strands represented by these two thinkers illustrated two different approaches to biomedical technology: Ramsey with his deep mistrust of technological manipulation, especially in the reproductive area, and Fletcher with his emphasis on mastery over nature.

2 Wilmut, I., Schneike, A.E., McWhir, J., Kind, A.J. and Campbell, K.H.S. (1997) “Viable offspring derived from fetal and adult mammalian cells”, *Nature*, 385:10-13.

3 McGrath, J. and Stolter, D. (1985) “Inability of mouse blastomere nuclei transferred to enucleated zygotes to support development *in vitro*”, *Science*, 226:1317-1318.

4 See Wilmut, I. Campbell, K. and Tudge, C. (1997) *Second Creation: The Age of Biological Control by the Scientists who Cloned Dolly*, Headline, London for an account of the historical developments.

5 Lederberg, J. (1966) “Experimental genetics and human evolution”, *The American Naturalist* 100: 519-531.

6 Ramsey, P. (1970) *Fabricated Man: The Ethics of Genetic Control*, Yale University Press, New Haven.

7 Fletcher, J. (1970) “Response to Lederberg” In: Vaux, K. (ed). *Who Shall Live? Medicine, Technology, Ethics*, Fortress Press, Philadelphia.

The 1970s and early 1980s were characterized by serious contributions from Willard Gaylin of the Hastings Center and Richard McCormick⁸, the Roman Catholic theologian and bioethicist. Although Gaylin saw the Frankenstein myth becoming reality with cloning, he was sufficiently perceptive to realize that a genetic Saint Francis clone could evolve into a tyrant, and a Hitler clone could have the potential for sainthood. McCormick in these early writings viewed cloning entirely in eugenic terms, his attention being riveted on maximizing traits like intelligence, creativity and artistic ability. In this he reflected the tenor of the general cloning debate underway at the time. There was even a published fraudulent claim that a human clone had actually been born – such is the power of cloning to mesmerize, tantalize and mislead.

In the early 1990s there was a flurry of interest in human cloning with the duplication of human embryos. Abnormal embryos were separated at the two-cell stage, thereby enabling the two resulting blastomeres to develop into separate embryos (akin to the natural production of identical twins).⁹ Relatively uninteresting as this was scientifically, it elicited a surprising amount of ethical debate.¹⁰ It brought to the surface issues that have subsequently become central in the cloning debate: the presumed loss of individual uniqueness, the possibility of causing harm to the interests of the child, the creation of embryos for the purpose of genetic diagnosis, and public policy issues.

While this academic debate was going on, considerable scientific progress was being made in a few agricultural research laboratories. At the Roslin laboratories outside Edinburgh, a succession of cloned sheep emerged, all part of an attempt to understand fundamental cellular processes and each representing a further step along this demanding scientific path. This sequence of studies showed that what is of critical importance for cloning is the cell cycle, particularly that of the donor cell. It was this shift in emphasis from the degree of differentiation to the cell cycle that made mammalian cloning feasible.¹¹

In the eyes of the public it was the announcement of the birth of Dolly in 1997 that transformed the character of the cloning debate, since the donor cell had come from an adult. However, the fundamental breakthrough had come earlier with the birth of two other sheep, reported in a 1996 *Nature* paper.¹² Although these were from embryonic donor cells, their birth established the

8 McCormick, R.A. (1981) *How Brave a New World? Dilemmas in Bioethics*, SCM Press, London.
9 Hall, J.L., Engel, D., Gindoff, P.R. et al. (1993) "Experimental cloning of human polyploid embryos using an artificial zona pelucida", *The American Fertility Society conjointly with the Canadian Fertility and Andrology Society*, Program Supplement, Abstracts of the Scientific and Oral Poster Sessions, Abstract 0-001, S1.

10 See articles in the 1994 issues of the *Kennedy Institute of Ethics Journal* (eg. Macklin, R. "Splitting embryos on the slippery slope: ethics and public policy", 4: 209-225) and the *Hastings Center Report*. (eg. McCormick, R.A. "Blastomere separation: some concerns", 24: 14-16).

11 See Wilmut *et al.*, *op cit.*

12 Campbell, K.H.S., McWhir, J., Ritchie, W.A. and Wilmut, I. (1996) "Sheep cloned by nuclear transfer from a cultured cell line", *Nature*, 380: 64-66.

validity of the cloning methods. Later clones included transgenic sheep, pointing the way to the rise of pharming – the manufacture of pharmaceutical products from genetically modified animals.

None of this work was carried out in secret, all the results were published in standard science journals, and it had nothing to do with the cloning of humans. Underlying it was an ardent desire to better understand fundamental developmental processes. Taken in isolation this scientific venture would have elicited little, if any, interest outside the scientific community, and yet, the spectre of human cloning transformed it into something horrendous and terrifying.

Moves towards the banning of human cloning

Regardless of the actual work going on in science laboratories, and of the goals of this work, the overwhelming response to cloning has been negative. Within two weeks of the initial announcement of the birth of Dolly, the European Parliament called for a ban on human cloning¹³, which it saw as a serious violation of fundamental human rights and as offending against human dignity. It also stressed that each individual has a right to his or her own genetic identity. The General Assembly of the World Health Organisation (WHO) adopted a resolution affirming that human cloning is contrary to human integrity and morality. The 186 member states of the United Nations Educational, Scientific and Cultural Organization (UNESCO) unanimously passed a declaration towards the end of 1997 calling for a cloning ban. Article 11 in its Declaration on the Human Genome and Human Rights declares that: “Practices which are contrary to human dignity such as reproductive cloning of human beings shall not be permitted.”¹⁴

The National Bioethics Advisory Commission (NBAC) in the United States produced a report in June 1997, in response to a request from the President.¹⁵ It recommended that in the short-term there should be a continuation of the moratorium on the use of federal funding in support of any attempt to create a child by somatic cell nuclear transfer (SCNT, human reproductive cloning) and an immediate request to the private sector to comply voluntarily with the intent of the federal moratorium. The reasons given concerned the safety of the technology and the fear that the widespread practice of human cloning would undermine important social values, for example by encouraging eugenics or the manipulation of others as objects instead of persons.

13 Official statements (1997), The European Parliament “Cloning animals and human beings”, *Bulletin of Medical Ethics* number 128: 10-11.

14 UNESCO (1997), *Universal Declaration on the Human Genome and Human Rights*, Article 11, November 1997.

15 National Bioethics Advisory Commission (1997) “Report on cloning by the US Bioethics Advisory Commission: ethical considerations”, *Human Reproduction Update*, 3: 629-641.

Similar sentiments were expressed by the Council of Europe's Convention on Human Rights and Biomedicine,¹⁶ by the Royal Society in the UK and the Academy of Science in Australia. In the UK the Human Fertilisation and Embryology (HFE) Act does not allow any research with reproductive cloning as its aim. In the USA the Human Cloning Prohibition Act of 2001 was passed by the House of Representatives, thereby outlawing the creation of cloned human embryos for any purpose, whether to make cloned babies or to produce potentially therapeutic stem cells. It also prohibited the importation of any medical treatments created abroad from cloned embryo cells. It imposes steep criminal and civil penalties (up to 10 years in prison and \$1m) on anyone violating the ban, including scientists creating cloned human cells solely for research purposes.¹⁷

These deep concerns are encapsulated by Leon Kass, American bioethicist and head of President Bush's advisory panel on stem cell research. In his essay, 'The wisdom of repugnance,' he writes: "We are repelled by the prospect of cloning human beings ... because we intuit and feel ... the violation of things that we rightfully hold dear. Repugnance ... revolts against the excesses of human wilfulness, warning us not to transgress what is unspeakably profound."¹⁸ For him, cloning is a pollution and perversion of begetting. It cannot be redeemed, since it is despotic, being a blatant violation of the parent-child relationship, and also a dehumanization of procreation.

Kass's stance on cloning follows from his long-expressed concerns about the artificial reproductive technologies. As long as 30 years ago, he regarded any intrusions into reproduction as a violation, since they blur the distinction between the natural and artificial. In 1972, he wrote: "To lay one's hands on human generation is to take a major step toward making man himself simply another one of the man-made things."¹⁹ Kass wants to keep human beings off-limits to technological intervention, on the ground that any such intervention will jeopardize the status of human beings, who for him are set apart by their divine nature, and by the freedom and dignity they possess. Any scientific intrusion into the manner in which human beings are brought into existence is to be resisted. A process as radical as cloning is cast as the worst of intrusions, since the clone would be saddled with a genotype that had already lived, thereby denying to it the freedom to be oneself and make one's own way in the world (for a critique of Kass's position, see below).

16 Council of Europe (1997) *Convention on Human Rights and Biomedicine: Additional Protocol on the Prohibition of Cloning Human Beings*, Article 1, Strasbourg.

17 Numerous accounts of this can be found in media reports. Examples are those in the *Washington Post*, *Los Angeles Times* and *New York Times* for 1 August 2001. See also *Time* magazine for 13 August 2001.

18 Kass, L. (1998) "The wisdom of repugnance" In: Pence, G. (ed). *Flesh of my Flesh: The Ethics of Cloning Humans*, Rowman and Littlefield, Maryland.

19 Kass, L. (1972) "Making babies", In *Toward a More Natural Science*, The Free Press, New York, pp. 43-79.

David King²⁰, editor of *GenEthics News*, considers that cloning represents the tip of a relentless search for uniformity, efficiency and control, taking it into the realm of industrial efficiency. According to this critique, Dolly is a product of industry, and were this to be transferred to the human scene (even in a limited fashion) it would subject human reproduction to total direction and control.

In the lead-up to the vote in the American House of Representatives many statements were made by contending parties. That of the conservative Christian pressure group, The Center for Bioethics and Human Dignity,²¹ focussed on the human embryo, thereby emphasizing an alternative set of reasons against human cloning. This stance led to a call for a ban on both reproductive and 'therapeutic' cloning, since human beings have a right not to be created for purposes of experimentation.

The American debate in the early months of 2002 has focused on making all types of human cloning illegal. For instance, in April President Bush called on the Senate to adopt legislation that would outlaw research cloning as well as the cloning of new individuals. In other words, the gap between therapeutic and reproductive cloning has disappeared. This move has been enthusiastically supported by various Christian groups (an editorial in *Christianity Today*²² argues for making all cloning illegal; a commentary from the Center for Bioethics and Human Dignity²³ describes cloning as 'an exercise of supreme and unrighteous power' and as 'barbarism of designing the born'). A concerted political campaign against all forms of cloning is being waged by groups like Americans to Ban Cloning (www.cloninginformation.org).

The mistrust of scientists

To some extent, opposition to cloning is tied up with opposition to scientific developments and even to the scientific enterprise itself. Its extreme nature is depicted as characterizing the worst of scientific maleficence, according to which scientists are attempting to radically transform human nature, modifying it and restructuring it in dramatic new ways. Scientists are misleading us, as they seek to tamper with that which makes us what we are; in doing this they are transgressing boundaries that should be out of the reach of human beings.

Consequently, cloning has become a metaphor for unbridled science, and for the unforgivable scientific sin. It has become a metaphor for the temptation of

20 King, D. (1997) "Led by the nose into clone cuckoo land", *The Times Higher Education Supplement*, March 21, p 11.

21 The Center for Bioethics and Human Dignity (2001). "Human cloning: The necessity of a comprehensive ban", July, <http://www.cbhd.org/cloning>.

22 Editorial (2002) "Goodbye Dolly", *Christianity Today*, 21 May, 46 (6): 36.

23 Commentary/Cameron, N.M. de S. (2002) "The prolife cause and the coming revolution", 20 May. The Center for Bioethics and Human Dignity <http://www.cbhd.org/resources/aps/nccomment1.htm>.

scientists to play God, a metaphor which however misused and twisted has extraordinary power to frighten and appal. The bravado of fearless scientists is detested and condemned, as they constantly overreach themselves and meddle in the very make-up of human life. Such fears appear to be justified when the likes of Drs Panayiotis Zavos and Severino Antinori publicize their plans to clone a human being by 2003.

Surely, some argue, such things should be left to God (even when the significance of references to God is unclear). *Time* magazine referred to Ian Wilmut as “the first man to create fully formed life from adult body parts since Mary Shelley’s mad scientist.” Although it could not get over Wilmut’s unexceptional appearance, it could not restrain the temptation of comparing him to Dr Frankenstein. The achievement was compared to the biblical account of creation: “Not since God took Adam’s rib and fashioned a helpmate for him has anything so fantastic occurred.” The theological overtones shone through repeatedly, as humans were described as creators, rivalling God.²⁴

Kolata²⁵ also grasped for theological language when confronted by cloning. For her, cloning brings us back to the ancient sins of vanity and pride. She writes: “Is there a hidden fear that we would be forcing God to give us another soul, thereby bending God to our will, or, worse yet, that we would be creating soul-less beings that were merely genetic shells of humans?”

Cloning is recognised by many as something apart from the common run of science, since it is not merely modifying human beings but actually creating human beings with what are regarded as predetermined (genetic) characteristics. Its macabre significance stems from its apparent ability to produce humans to order, in ways that suit our purposes rather than theirs. They will be our commodities, not our peers.

It is the alleged totality of the process that abhors and repels so many people. In his more recent writings Kass, in association with Daniel Callahan, describes cloning as: “unethical experimentation on the child-to-be threatening individuality, by deliberately saddling the clone with a genotype that has already lived and to whose previous life its life will always be compared.”²⁶ They argue that it confuses identity and converts procreation into manufacture; for them cloning is despotic, since it involves designing the genetic makeup of children. Not only this, it is the harbinger of even worse eugenic manipulations in the future.

Kass²⁷ wants to exert control over where biology is taking us, and since in his estimation nothing scientifically or medically important would be lost by

24 *Time* (1997) “A special report on cloning”, 10 March, pp 40-53.

25 Kolata, G. (1998) *Clone: The Road to Dolly, and the Path Ahead*, William Morrow and Co, New York, pp 5-6.

26 Kass, L.R. and Callahan, D. (2001) “Ban stand redux”, *The New Republic*, 6 August.

27 Kass, L.R. (2001) “Why we should ban human cloning now: Preventing a brave new world”, *The New Republic*, 21 May.

banning cloning, we have a once-and-for-all opportunity to prevent ourselves hurtling into a 'post-human world'. From his perspective, we have to decide whether we shall be slaves of unregulated innovation or free human beings who guide our powers toward the enhancement of human dignity.

Theological arguments against cloning

Arguments by theologians²⁸⁻³² centre on cloning being regarded as:

- overstepping the limits of human dominion
- violating human dignity
- reducing its products to a sub-personal status
- experimenting on human embryos (beings)
- making children as opposed to begetting them
- subverting the uniqueness of human beings
- fostering a reductionistic view of human nature
- militating against the uncontrollability of biological processes.

This is an interesting mix of theological and pragmatic arguments, which have a great deal in common with arguments against cloning that claim no theological grounding. For a number of writers a theological thrust starts with the creation story in Genesis, with its connection between the differentiation of the sexes and the begetting of a child.³³ Maintaining the connection between procreation and the sexual relationship of a man and woman is regarded as essential both for that relationship and for any offspring. From this it is argued that the production of children by cloning becomes a project of individuals, lending itself to being narcissistic, reflecting oneself and one's own desires, and producing children for self-centred purposes. Human beings become creators and controllers in their own right.

This introduces what is viewed by some as the crucial distinction between begetting and making.³⁴ While 'begetting' results in someone like us, 'making'

28 Ramsey, P. (1970) *Fabricated Man: The Ethics of Genetic Control*, Yale University Press, New Haven.

29 Bruce, D. (1997) "A view from Edinburgh" In: Cole-Turner, R. (ed). *Human Cloning: Religious Responses*, Westminster John Knox Press, Louisville, pp 1-11.

30 Evans, A.R. (1997) "Saying no to human cloning" In: Cole-Turner, R. (ed). *Human Cloning: Religious Responses*, Westminster John Knox Press, Louisville, pp 25-34.

31 Grabowski, J.S. (1998) "Made not begotten: a theological analysis of human cloning", *Ethics and Medicine*, 14:69-72.

32 Meilaender, G. (1998) "Begetting and cloning" In: Pence, G. (ed) *Flesh of my Flesh: The Ethics of Cloning Humans*, Rowman and Littlefield, Maryland, pp 39-44.

33 *Idem*.

34 O'Donovan, O. (1984) *Begotten or Made?* Oxford University Press, Oxford.

results in someone unlike us. Begetting expresses equal dignity since we are not at each other's disposal, whereas making loses this sense of equality. While these are criticisms of the artificial reproductive technologies, cloning is viewed even more as a form of production, "far less a surrender to the mystery of the genetic lottery ... far more an understanding of the child as a product of human will."³⁵

A related argument is that cloning exceeds the limits of the delegated *dominion* given to the human race by God³⁶, because humans were not given authority to alter their nature or the manner in which they come into existence. Consequently, cloning has been likened to eating the fruit from the forbidden tree in the Garden of Eden: it is delving into the knowledge of good and evil.

All technological manipulations of the reproductive process are viewed as a move away from the personal towards the impersonal, thereby posing a threat to the dignity of the person.³⁷ As the sexual and personal relations of normal love-making are replaced with overtones of a factory process, the notion that any resulting child is a gift (from God) disappears. The reproductive process is relegated to that of producer and product, a mere laboratory procedure.

For Ramsey³⁸ a child is neither a human achievement nor a product, but a gift of God. His apprehension about the intrusion of technology into the act of procreation carried over into cloning, and placed him implacably against such ventures – even though they lay in the future at the time he was writing in the 1960s and 1970s. Alongside this, he was deeply concerned with the voiceless in any human experimentation, and he repeatedly pointed to the importance of caution and humility in the face of what may appear to be overwhelming scientific enthusiasm and brashness.

Reasons for cloning

Why would anyone want to clone? In current debate, the reasons tend to have a reproductive flavour to them, rather than some idealistic thrust (with the exception of the Raelian cult [www.rael.org; also www.clonaid.com]). Nevertheless, for some, cloning is viewed as a route to immortality, a means by which an individual can cheat death. This is foolhardy and illusory, for the simple reason that the clone is a different person from his or her progenitor, who will die as inevitably as if he or she had not been cloned. The individual will live on in his or her clone only to the extent that we currently live on in our naturally conceived children. There is no way to cheat death, cloning or no cloning.

³⁵ Meilaender, *op cit.*

³⁶ Grabowski, *op cit.*

³⁷ *Idem.*

³⁸ Ramsey, *op cit.*

A prominent reason would be the desire of infertile or lesbian couples to have genetically related children. It is interesting that this use of cloning would not involve imposing a particular plan on the child. The purpose is to have a child genetically related to one of the partners. This by itself does not justify cloning, since there are crucial moral issues to be taken into account as well as the well-being of the child.

Other reasons commonly encountered in the literature include the following: parents wishing to replace an aborted fetus, a dead baby or a child killed in an accident; parents looking for a sibling to be a compatible tissue or organ donor for a child dying from leukemia or kidney failure; a couple with a recessive lethal gene, who wish to have a genetically-related child and, therefore, want to avoid the use of donor genes or selective abortion; a wife whose husband is dying and who wishes to have biological offspring of the dying husband.

In each of these cases, the children would be subjected to the special purposes or projects of adults. Each one prompts us to ask whether the child is being loved primarily for his or her usefulness, rather than for what they bring to the world as unique individuals. Each places the spotlight on the needs of an individual (parent, sibling) who is not the child to be born. The prospects of using the child to serve the purposes of another are extremely high, although not inevitable. One has to ask whether it is worth introducing cloning into the medical armamentarium for cases such as these. While some of the cases are heart-rending, we all have to cope with suffering and loss, and a biological solution may be deeply flawed.

Another danger in some instances is to assume that the cloned child will be the same as the one so tragically lost. A replacement metaphor is gravely misleading. The parents would not be “getting back” the same child as the one that was lost; but a different one. Children are not interchangeable commodities.

Assessing the case against cloning

There is widespread feeling that cloning is both unacceptable and objectionable. In view of this, arguments in its favour appear ephemeral. However, if the arguments against it are not as strong as many assume, calls for it to be banned could have a hollow ring in the future. Is its character as radically different from that of other manipulatory procedures in contemporary biomedicine as some think? The arguments, whether from Christian or secularist sources, are worth further attention.

Critique of Kass's position

Since Leon Kass holds such a pivotal position in this debate in the United States, some attention should be paid to his arguments. His repugnance cannot be readily dismissed but at the same time it cannot be taken as a moral arbiter. Other factors have to be taken into account. Many technological devel-

opments (IVF, organ transplants, the notion of brain death) have initially elicited this reaction, but have later been accepted. By itself, repugnance does not constitute a moral argument against something. Condemnation of cloning because it is an artificial intrusion into reproduction is baseless, unless all artificial intrusions into reproduction (let alone human life in general) are also condemned. Since Kass has little sympathy for any scientific intrusion into anything human, his opposition to cloning is not unexpected. In other words, his opposition to cloning is part of a much broader anti-technology stance, allied with a profound fear that humans are dehumanizing themselves.

Cloning imperils human dignity

Much of the debate on cloning assumes that clones will be produced to satisfy the ego of their progenitors. This is what I have referred to as ego cloning.³⁹ They will be produced to boost the cloner's ego, to satisfy this individual's whims, and as a mere plaything. An even more popular fear is that of mass cloning in a totalitarian society, where clones will be used as slaves. Such motives are reprehensible, and would no doubt undermine human dignity. Another possibility is their production to replicate someone who has already lived, thereby reenacting that previous person's existence. The danger of this has already been pointed out, with its emphasis on what the clone can do for the parent(s) rather than on the inherent value of the clone for herself.

These are 'worst case scenarios', although for many writers this is the only way in which cloning is depicted. The assumption appears to be made that these questionable or foolhardy motives are the only ones behind cloning, and clones will always be mistreated. While it would be shortsighted to deny the reality of these possibilities, it would be equally shortsighted to contend that cloning will always be carried out in these ways. Contemporary scientific debate is far removed from cloning on a mass scale, and clones will not be nearly as similar to their progenitors as suggested by these scenarios. Nevertheless, for many, cloning is inherently tainted. Why?

In the first place, it is argued that cloning will lead to an instrumentalization of human beings, who will be treated as objects and not as people. They will be treated as things to be exchanged, bought and sold in the market place. These are valid concerns, since the temptation to control the future direction of children's lives is very high, cloning or no cloning. Unfortunately, parents sometimes make children instruments of their own ambitions. Regardless of whether children are conceived naturally or artificially, they should be accepted for who they are and loved for who they are. Existence must be in the best interests of the child who must then be given the freedom to develop as a unique individual. Some clones would probably be treated in an instrumental fashion, but others might not. There is no inevitability about this.

³⁹ Jones, D.G. (2001) *Clones: The Clowns of Technology?* Paternoster, Carlisle.

A second reason why cloning is considered to be tainted is that the genetic similarity between a clone and its older progenitor makes it likely that the clone will be forced to walk in the footsteps of another. Excessive demands will be placed on clones by parents or genotype donors to ensure that they live up to a set of preconceived expectations – to be exactly like ‘daddy’ or ‘mummy’ (or a famous individual?). These are legitimate concerns, and yet they rely in large part on the cloning having been carried out for egotistical reasons. To force a clone to walk in another’s footsteps would primarily be accomplished behaviourally rather than biologically. Behavioural cloning, where excessive demands are placed on individuals or groups to perform to certain expectations in, say, sporting, artistic or church circles, is no more justifiable in these circles than it would be in cloning.

Writers like Hans Jonas⁴⁰ argue for the right to ignorance and to an open future (on the assumption that this happens now with naturally fertilized children). Such openness is viewed as essential for the spontaneous, free, and authentic construction of a life and self. I agree; what is more debatable is whether a later twin (clone) will know that his or her life had already been lived out by another, in the sense that the clone could do nothing beyond repeating a life already lived. The confident assertions that this will be the case, are nothing more than speculations. It would be tyrannical of a progenitor to try and determine another’s fate in this way. However, in a healthy family and social environment, this would be unlikely; one may actually learn from the progenitor’s life.

It is possible that cloned children (just like ordinary children) will surprise us, by demonstrating far more individuality than we could ever imagine. The ethical and theological debate should pay far more attention to what we might want from cloning and from cloned individuals, and far less attention to the technique of cloning, which in itself may or may not transcend moral boundaries.

A third reason why cloning is viewed as imperilling human dignity is that clones would lack genetic uniqueness, on the assumption that our freedom resides in the genetic lottery and in genetic uncertainty. Are we free as human beings only because of the unpredictability of our genetic combinations?⁴¹

There are two strands to this argument. The first is that the genetic mixing which occurs in sexual reproduction should not be meddled with by patients or doctors, since they will alter it for their own ends and impose upon children genetic combinations of their own choosing. This is an argument more against genetic modification than against cloning, since the latter would be a very crude way of determining an offspring’s genetic combination. It also assumes

40 Jonas, H. (1974) *Philosophical Essays: from Ancient Creed to Technological Man*, Prentice-Hall, Englewood Cliffs, New Jersey.

41 Kahn, A. (1997) “Clone mammals... clone man?” *Nature*, 386: 119.

that any modification will be detrimental to the health and welfare of the children.

The second strand is the more fundamental one: our uniqueness as individuals stems entirely from our genetic uniqueness. However, identical twins demonstrate unequivocally that whatever the relationship is between human and genetic uniqueness, it is not a direct one. Similarly, clones with identical genetic make-up would have different brains. This is because the organization of the brain is as much dependent upon soft wiring (influenced by the environment) as upon hard wiring (built in genetically). Environmental influences are not mere after-thoughts or unimportant peripheral add-ons, but are essential for the final form of any brain.⁴² Our identity is shaped by the history of our relations with others⁴³, and by our biographies. Theologically, our personhood and identity are God's gracious gift, and not something that humans can manufacture or copy.⁴⁴

The two individuals concerned would have different phenotypes (just like identical twins), a different sense of self, different thought processes, and different ethical responsibility. Their biological uniqueness would remain, let alone their spiritual uniqueness, which lies in their relation to God. This is determined by God's active grace and his desire to love us, and not by DNA.⁴⁵ Our value rests upon a dignity bestowed by God and independent of our genetic status. Our identity before God comes from God's ongoing grace and from our desire, or lack of it, to live in close communion with him. This is not biologically based.

By itself, a lack of genetic uniqueness cannot be a threat to our freedom. It has to be overlain with other factors forcing us to conform to the whims of other people, who would have to force us to see what they want us to see, read what they want us to read, view the films they want us to view, and listen to the music they want us to listen to. It may be possible to manipulate someone's brain to be the sort of brain we want it to be, but that demands far more from behavioural pressures than from genetic ones. This is a reminder that an individual's uniqueness is placed in jeopardy by forcing them to perform in a pre-ordained manner. This could have a biological component, although undue stress upon this is only made possible by imposing a form of biological pre-determinism on a technique like cloning.

From this one might conclude that the technique of cloning in its narrowest

42 Eisenberg, L. (1998). "Experience, brain and behaviour: the importance of a head start", *Pediatrics*, 103: 1031-5.

43 McFadyen, A.I. (1990). *The Call to Personhood: A Christian Theory of the Individual in Social Relationships*, Cambridge University Press, Cambridge, pp 31-39. See also Messer, N. (2001). *The Ethics of Human Cloning*, Grove Books, Cambridge, p 17-18.

44 Messer, *ibid.*, p 18.

45 Peters, T. (1997) "Cloning shock: a theological reaction" In: Cole-Turner, R. (ed). *Human Cloning: Religious Responses*, Westminster John Knox Press, Louisville, pp 12-24.

sense is a matter of indifference, even for Christians.⁴⁶ While Christians may not choose cloning, neither may they seek to prohibit it. In Jesus Christ, we see a welcoming of children that transcends genetic parentage, a perspective that throws light onto how they are treated and regarded, and the place they occupy in society.

For some, even the possibility of thinking in this manner will seem outrageous. The repugnance of the procedure transcends all other considerations. But, as we are discovering, there are enormous problems in bedding this down with convincing arguments. What, then, about the technique itself?

Cloning represents a technological manipulation of reproduction

Concern over the intrusion of technological procedures into the reproductive process centres around a transformation of reproduction into an impersonal form of manufacture. The worry is that clones will be seen as products made to order. Instead of accepting whatever emerges from the union of man and woman, the thrust of this criticism is that cloning attempts to mould the child according to human specifications. While cloning is viewed (incorrectly in my estimation) as the ultimate step in this direction, it is applied in varying degrees to all forms of artificial reproduction.

Unfortunately, proponents of this criticism tend to assert with assurance that any resulting children will be viewed as a product rather than a gift. This is a pragmatic argument, which ignores currently available empirical evidence on IVF and DI (donor insemination) children that fails to support this contention.⁴⁷ The presence of an artificial element in reproduction does not appear to lead invariably to a downgrading of the subsequent status of these children and adults. The resulting individuals give every impression of being ordinary individuals: indeed their ordinariness can be stunning. But this should not surprise us, since we have successfully incorporated artificial elements into almost every facet of our lives. While this does not justify doing the same in reproduction, it behoves us to be wary about condemning artificial reproduction too hastily.

As in other areas, a critical element is that of the attitudes and motives underlying our ventures: we are to treat others as equals, and as beings of dignity, regardless of their method of fertilization. To some this is a contradiction in terms, since the production of clones has already deprived them of their dignity; but this is far from self-evident. Human clones would be derived from people, would undergo gestation in a woman, and would be brought up by normal

46 Cole-Turner, R. (1997) "At the beginning" In: Cole-Turner, R. (ed). *Human Cloning: Religious Responses*, Westminster John Knox Press, Louisville, pp 119-130.

47 Golombok, S., Brewaeys, A., Cook, R., Giaruzzi, MT., Guerra, D., Mantovani *et al.* (1996) "The European study of assisted reproduction families: Family functioning and child development", *Human Reproduction*, 11: 2324-2331.

humans. The whole context of their upbringing and lives would be that of human families. The onus on those around them would be to interact with them as with any fellow human beings. Any downgrading of human clones would be imposed post-conception and post-birth, far more so than at their inception by cloning. Christians, in particular, should vigorously oppose even the merest hint that human clones could be treated in sub-personal ways.

The potentially impersonal nature of cloning is aggravated by the picture so frequently painted of its leading to the factory production of babies. This is a deeply disconcerting picture from which we recoil, but is it misleading? The production of a particular model of automobile is characterized by precision, equivalence and uniformity. There is no room for individuality on the production line, since each car has to conform to the specifications of that model. To use a biological analogy its manufacture is entirely genetic in character; there is no environmental component since no development is possible subsequent to factory manufacture. Were the cloning of human beings to result in such reproducibility, we would be rightly alarmed. However, an environmental component is implicit in the production and subsequent development of all human beings – whether cloned or naturally fertilized, and it is this that separates human reproduction (even with impersonal elements) from factory manufacturing processes. In this sense, biological manufacture is a misnomer.

But what if scientists and parents adopt a technocratic attitude toward cloned children, treating them as artifacts? This is a possibility and yet cloning is not alone in this; there is a continuum from cloning (and/or genetic modification) at one extreme to aberrant parenting at the other. It is an exaggeration to describe cloning as baby design and manufacture, just as it is to view it as the way into a post-human future. Children should never be simply projects of our will, remembering that we impose our wills on our children in a variety of ways (from selecting the ‘right’ schools to the ‘right’ professions for them). Current reproductive technologies do not of necessity increase the likelihood of this taking place, and neither will cloning.

It has been claimed that cloning would divorce genetic parenthood from relational parenthood, since the biological parent of the clone would be the parents of the donor and not the nucleus-donor.⁴⁸ There is no doubt that a wedge is being driven between biological and family relationships. This, in turn, may usher in a new social order, that could have a distorting effect on the image of God in humankind. This profound concern has to be taken seriously, although whether it sets cloning as dramatically apart from the gamut of other parenting possibilities currently in existence is a matter for debate. Nevertheless, all these may be at odds with God’s creation ordinances.⁴⁹

48 Alexander D.R. (2001). Cloning humans – distorting the image of God? *Cambridge Papers* 10 (2): 1-4.

49 Jones, D.G. (1987). *Manufacturing Humans*, Inter-Varsity Press, Leicester, pp 1-20.

Cloning will harm the resulting child

The enormous risks currently associated with attempting to clone humans (as with laboratory and farm animals) are ample justification for condemning human cloning at present and into the foreseeable future. There is no justification for proceeding with any procedure unless there is clear evidence to justify its use clinically. At present, the chasm of unknowns is prodigious, and no one acting in an ethical manner would even contemplate cloning humans. This has been forcefully expressed by the Roslin Institute, which has a summary of all cloning papers published up to August 2001 on its web site (www.roslin.ac.uk/public/cloning.html). The overall success rate is of the order of 1-2% of cloned embryos producing live births. Of those born alive, a wide variety of abnormalities has been found in them.⁵⁰

However, this argument is in no way unique to cloning. It is a pragmatic argument, and the same applies to any other scientific or clinical development. There is no difference between cloning and a surgical operation; if the chance of causing damage to the patient is unacceptably high, it is unethical to proceed. In other words, if the disadvantages outweigh the advantages, it should not be attempted. This may change with time, but that will depend on a large amount of animal experimentation and a considerable increase in understanding the scientific processes involved.

To me, this is the definitive argument against human cloning in current debate. But it must be seen for the pragmatic argument it is. By itself, it is not a sure argument against cloning for time immemorial.

Cloning involves experimentation on human embryos

Within some Christian circles, opposition to cloning stems from the total moral rejection of using human embryos for research purposes.⁵¹ The driving principle here is that cloning is undermining the welfare and dignity of human embryos, which as the weakest and most vulnerable of human beings should under no circumstances ever be experimented upon. Human embryos (blastocysts) should be treated exactly as we would treat each other. For many Christians this is a non-negotiable position, which if carried through in ongoing debate, will outlaw any form of cloning (research/therapeutic as well as reproductive). Other Christians, while not holding that the pre-implantation human embryo is to be valued as highly as this, reject cloning-associated research because they fear embryos are being used as commodities.

The theological and ethical issues raised by this position are the same as

50 Wilmut, I., Griffin, H. (2002) "Why no-one should be attempting to clone a child" Roslin Institute, www.roslin.ac.uk/public/cloning.html.

51 The Center for Bioethics and Human Dignity, *op cit.* (reference 21).

those encountered with any other research protocol using human embryos.⁵² Whatever principles are accepted in other areas will apply equally in regard to cloning. However, cloning introduces an ironic element. Human reproductive cloning, including implantation of the cloned embryo into a woman's uterus for development to term (currently banned in most societies) could one day result in new human life – a life to be cherished and protected. In contrast, human therapeutic cloning, aimed at producing tissues for therapeutic purposes, prevents the further development of an early blastocyst into an individual, and therefore would involve the destruction of embryos. Consequently, this argument against cloning is directed more against human therapeutic cloning than against human reproductive cloning, even though this is not always its intention.

Cloning represents excessive human control

For some Christian writers, there is conflict between the human control of reproduction and God's way of creating. Any increase in human control leads to God's way being usurped. The two are at loggerheads. In view of this, the uncertainties of the genetic lottery come to constitute the central plank of God's way of creating, that is, the lottery element within genetic inheritance is viewed as integral to God's plan for human reproduction.⁵³ Remove the lottery element and God's involvement is threatened and even removed.

The randomness of genetic inheritance, with the redistribution of characteristics that goes to make-up the emerging individual, is basic to sexual reproduction. Consequently, any process having major repercussions for this redistribution will probably have detrimental consequences, since it would take us well beyond the range of human understanding – now and perhaps at any time in the future. But does this also mean that the occasional deviation would be catastrophic? The answer appears to be 'no' since identical twins are deviations, and everyone copes with these remarkably easily. While intentional cloning introduces many other considerations (as we have seen), the genetic issues raised by cloning are not dissimilar to those encountered with identical twins.

What, then, is the theological imperative for looking to mystery rather than understanding? When the gene lottery goes seriously wrong, resulting in distressing diseases, we have traditionally attempted to rectify the errors. Although this has been done indirectly, by manipulating the results of the genetic errors, there appears to be no difference in principle between this and directly influencing genetic combinations (as long as the science is reliable). Although we have not been prepared to accept what the genetic lottery turns

⁵² See the discussion on human embryo research in Jones, D.G. (1999) *Valuing People*, Paternoster, Carlisle. See also Iglesias, T. (1987) "What kind of being is the human embryo?", in Cameron, N. M. de S. (ed). *Embryos and Ethics* Rutherford House Books, Edinburgh, p 70.

⁵³ Meilaender, *op cit*.

up in later life, we are being urged to do so in early reproduction. Human control is being viewed as excessive in the realm of reproduction and human development, but not to the same degree later in life. A distinction is being drawn between the two, and in making this distinction, the reproductive realm is being converted into sacred territory, where God alone dwells. This carries too many overtones of a 'God-of-the-gaps' approach, which needs to be justified far more than it has been up to now.

Why is there this fear of human abilities? The power exerted by humans in weaponry and information technology is truly awesome, and the consequences for ill are sometimes all-too-evident. And yet for many, the reproductive technologies represent the crossing of the Rubicon from control external to the human person and apparently a legitimate realm, to control of the human person itself and an illicit area for human interference. The significance of this boundary requires close analysis. What is crucial is that individuals are provided with opportunities to flourish as free and purposeful beings. It is this, rather than the mystery of ignorance, that is important.

Control is a two-edged sword, because while some forms may be beneficial, others are to be avoided. Differences and individual characteristics should be maintained in the midst of precise technological control. Grand designs for human beings are inappropriate, and are achievable by social control. It is here that the problem lies, rather than with the possibilities opened up by biological control. Even with human intervention, there will be mystery, whether of life, of compassion, of commitment to one another, of worship, or of purpose.

On occasion cloning is condemned because it is alleged to exceed the limits of the dominion delegated to human beings by God; it is delving unacceptably into the knowledge of good and evil. Two biblical images, Eden and Babel, may be of general value in framing a Christian perspective. In Eden human beings are given dominion over the garden, having responsibility for tilling and keeping it (Genesis 1: 26; 2: 15). Nevertheless, it is a limited dominion. This tells us that the world was not created by us or for us; we are to enjoy it and are to develop it judiciously as stewards. The other side of the picture is provided by Babel (Genesis 11), with its depiction of unrestrained ambition and the desire to be like God. There is no room for the role of steward, as everything is trampled underfoot, and the lust to control and master is allowed sway. The contrast presented by these two pictures is between directed and undirected control.

In relation to cloning the Babel image is used to stress excessive human control in the reproductive realm, which should therefore be placed beyond the reach of scientific investigation. An extreme interpretation is to make prenatal existence untouchable. Such an interpretation is only possible by ignoring the balancing perspective provided by the Eden image.

These pictures illustrate either abdication of our responsibilities for the created order and a fatalistic response to put our God-given skill to good use, or

the arrogant use of this skill to pretend we are gods without limits.⁵⁴ Both have to be taken seriously because our abilities can be harnessed for good or destructive ends. But will they tell us whether it is appropriate to go in the direction of human cloning, or to stand back and totally reject it?

For Messer,⁵⁵ reproductive cloning is an attempt to control the development of a person's identity. This is implicit within cloning, even in innocent scenarios, such as cloning to bypass infertility. Hence, cloning is an attempt to do what is not properly ours to do. As a result, it distorts the moral structure. It is not clear to me that creaturely limits are being overstepped in this situation, since human relations are not of necessity abrogated, while personhood and identity may still emerge as God's gracious gift in a cloned individual. However, this is a reminder of the care that has to be exercised whenever either biological or social control is exerted over another individual.

Cloning is antagonistic to Christian aspirations

The dominant thrust of this position stems from viewing creation as a completed act, whereby the natural world as we know it reflects the world created by God. Since it is a given, humans are not to tamper with it, nor with the make-up of humans themselves. By definition, God's likeness cannot be improved upon, and therefore human nature is not to be modified. Our biological nature, the way of bringing humans into the world, and the organization of our bodies and brains are all 'given'.

Illustrations from the Bible used in favour of this interpretation come from the boundaries that are not to be crossed in the Old Testament: eating the forbidden fruit; sex between humans and animals (Leviticus 18: 22-24; 20: 12, 15-16); cross breeding animals and planting a field with different types of seed (Leviticus 19: 19; Deuteronomy 22: 9); constructing a garment of both linen and wool (Leviticus 19: 19; Deuteronomy 22: 12). Erecting boundaries like these may have an important role to play in society, but we have to enquire further about the reasons for erecting them, and whether these are relevant in the biomedical area. For instance, are boundaries to be erected to prevent kidney transplantation, manipulation of the gastrointestinal tract or heart, interference with sexual reproduction, or the use of psychotropic drugs to modify brain function?

Viewing creation as a completed act leads to an acceptance of the world as we know it, and yet this interpretation appears to be a malleable one. It features prominently in the genetic and prenatal areas, but is largely ignored in other biomedical areas. It leads to an emphasis on rectifying disease and that which has gone wrong, as opposed to attempting to improve upon that which has been given. This is a useful guide in most situations where disease is the

⁵⁴ Messer, *op cit.*, p 19.

⁵⁵ *Ibid.*, pp 15, 21.

focus, and if other issues are ignored may encourage forms of therapeutic cloning (as opposed to the cloning of individuals). This in no way justifies any form of cloning, but it serves to remind us that the Old Testament boundaries were intensely practical ones, and this should be our guide here as well.

Is this as far as we can go in applying Christian thinking on creation? What about viewing creation as a transformative process, according to which God moved the world from a chaotic nothingness to an ordered light-filled, life-bearing place? If we view God's creative activity as ongoing, we come to recognize a divine-human partnership in our stewardship of creation. In these terms, the emphasis shifts onto God's good purposes and away from a particular form of creation. In turn, what becomes important are the creativity and inventiveness humans display as images of God. Acting as stewards of God's creation, we put our creativity to work to assist in major endeavours: to overcome disease, alleviate poverty and hunger, expand the wealth of human achievement, and develop technology across many broad fronts.⁵⁶

As we move along these paths, we continually have to ask ourselves where the line between continuity and transformation is to be drawn. If creation is a transformative process and if we have a part to play in bettering our world, our assessment of human cloning will depend on the manner in which it is employed. Can it ever be used for good ends, or is it so inherently evil that only evil ends will result? If the former, the motives and end-result of cloning will emerge as crucial. If the latter, there is no way in which the cloning process can be redeemed. The view that cloning is inherently evil depends, in part, on regarding the mysterious and uncontrolled in biology as of theological importance. What are we to make of this?

Seeing God's hand in the uncertain and mysterious is relatively easy, whereas seeing his hand in what we control is more difficult.⁵⁷ "If, at some time in the future, genetic engineering were to be in a position to remove some of that randomness and uncertainty, would this undermine the belief that humans are created by God in his image? Regardless of the extent of our capabilities, there is no escape from the wonder of creation and the gift of new life. No matter how much technology is used, the gift will still be significant. Our responsibility is to ensure that the nature of the technology, and the manner in which it is employed, are worthy of our status as beings in God's image, enhancing the dignity of all individuals involved.

But can sinful human beings be entrusted with control of this order, especially when this is genetic control? To this there is no assured answer. The world has been transformed for the better with the control of many diseases, although even this has negative facets. On the other hand, to bring children into the world as mere technological showpieces would be a travesty. However,

⁵⁶ Reichenbach, B.R. and Anderson, V.E. (1995) *On Behalf of God*, Eerdmans, Grand Rapids.

⁵⁷ Jones, *Clones: The Clowns of Technology?*, *op cit*.

children are brought into the world naturally for fatuous and irresponsible reasons, so that the divide between the natural and artificial is far from clear-cut.

The givenness of our world and our ability to transform it are both limited pointers to how we act in the biomedical arena, and more precisely how we face up to the possibility of human reproductive cloning. We seek to transform what needs to be transformed but gratefully accepting much else as given. Unthinking acceptance of cloning just like unthinking rejection will be found wanting.

Weighing the evidence

I have adopted a sceptical stance in assessing the arguments against human cloning, not because I wish to promulgate cloning as a desirable reproductive alternative, but because accepting seriously insubstantial reasons against it may have detrimental effects on the standing of science in the eyes of the public (including the Christian community) and policy makers. SCNT, along with stem cell technology, have already been hindered, even though the aim of these procedures is the alleviation of disease.

In the first place, I see no reason for encouraging human reproductive cloning, since the temptation to make other people in one's own image is too great. While cloning would not be alone in bringing this about, it would undoubtedly accentuate the danger. Cloning may also tempt us to think increasingly of children as products, who are expected to conform to quality control standards.⁵⁸ This is not inevitable, but cloning adds to the possibilities. Allied with this is the distinct probability that cloning would be very closely linked with commercial drives, as is the case with surrogacy and even with the use of donated embryos and gametes. Hence, it would be opening up another avenue for allowing commercialism into the fabric of the human body.

Human cloning sounds warning sirens. Whatever position we adopt on it should be controlled by a vision to treat children (and adults) with dignity, even if they are the products of advanced reproductive technology. We need to see them as the gift both of this technology and of God, since God loves them (including clones) as much as he loves everyone else.^{59,60}

Second, cloning is not as distinct from the other artificial reproductive technologies as frequently suggested. It is to be found towards one extreme end of the reproductive biomedical technology continuum, and hence is to be examined within this context. It is for this reason that many of the arguments used against human cloning are also arguments against *in vitro* fertilization (IVF) and its many offshoots, and even against donor insemination (DI). Few commentators develop this position adequately. If we oppose all technological

⁵⁸ Peters, *op cit.*

⁵⁹ *Idem*

⁶⁰ Jones, *Clones: The Clowns of Technology?* *op cit.*

inroads into the reproductive process, it is consistent to oppose cloning. On the other hand, opposition to cloning has to be far more nuanced when there is general acceptance of the artificial reproductive technologies, while acceptance of the latter under certain conditions does not entail automatic acceptance of cloning. Each is to be assessed on its merits and on the individual circumstances and perspectives of those contemplating their use.⁶¹

Third, our ethical and theological viewpoints are not to be dominated by technological accomplishments. The debate over cloning (in the general sense) has been almost totally skewed by the spectre of the cloning of humans. The technology has been demonised, as if it has no parallels anywhere else in human experience. This emphasis on cloning as the worst possible development that could confront the human race allows policy makers to ignore the myriad ways in which the genetic potential of humans born into impoverished environments is stunted and thwarted. It allows us to resolutely ignore the good we could do by committing adequate resources to alleviate malnutrition, providing adequate clean water supplies to numerous populations, and ridding countries of killer diseases like malaria, TB and HIV/Aids (which together kill 5.4 million people each year). Equitable health care systems would save countless lives each day, and yet something as relatively untechnological as these are overlooked. I have encountered no evidence to suggest that the existence of human clones (in societies and families that treat them with dignity and as people of equal worth) is worse than countless children dying needlessly each day from preventable diseases.

This leaves us with a number of emphases: the dignity of human life, a dignity that comes from God who created us and who sustains us; our responsibility as humans made in the image of God, a responsibility that extends into all areas of human existence; our scientific abilities to improve the quality of human existence; the tentativeness with which we should manipulate and alter other humans, whether behaviourally or technologically; the importance of our relatedness to others within the human community, before birth as well as after birth.⁶² These emphases do not provide us with a categorical answer on either reproductive or research/therapeutic cloning, but they provide indispensable guidelines for governing the direction of our policies.

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⁶¹ Jones, *Manufacturing Humans*, *op cit.*

⁶² Compare Moore, P. (2002) "Reproductive cloning", *Christian Medical Fellowship Files*, Number 16.