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1 AUTHOR:

Alex Sanchez-Vivar
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Alejo Sánchez-Vivar
Master in Medical Law and Ethics, University of Glasgow

Inquiries should be addressed to Alejo Sánchez-Vivar, 15 Southpark Terrace, Glasgow G12 8LG, UK
E-mail: alex.sanchez-vivar@fvhb.scot.nhs.uk

Introduction

Rubens' *Chained Prometheus*[i] is a classic example of the characteristic baroque sense of movement and tactile strength. Peter Paul Rubens injects into it the lusty exuberance and the frenetic energy that we expect from a Greek mythological legend, a myth that represents the anger of the gods when Prometheus stole for mankind the sacred Olympian fire[ii]. To punish Prometheus, who also created the first men according to one tradition, Zeus ordered him to be chained to a rock in the Caucasus and sent an eagle to consume his liver – which continually renewed itself.

With a masterful command of detail and an unflagging technical skill, Rubens tells us what happens when someone threatens the authority of the gods, how severe the deserved punishment might be, but perhaps also how hopeful we – humans – might remain. Today, we are not afraid of the gods' revenge, we clearly distinguish beliefs and science, but creation is still a mysterious wonder in many senses, a scientific challenge perhaps, and also an intangible secret which is hardly understood.

Advances in biomedical technology, and particularly in human cloning, seem to move the (divine) secret of giving life from fiction into science. Human cloning is now in the spectrum of future possibilities to reveal the secret of creating a living being, but certainly not without generating a "public outcry and fear"[iii]. Indeed, we can engage in biomedical research with a clear sense of moral principles or we can progress without an ethical compass into a world we could live to deplore. How we attempt to control human cloning will place us on one path or the other.

The case of cloning in which the goal is to produce a person (a genetically identical individual) will be the main focus of this paper. Its purpose is to analyse the ethical and legal aspects of the issues raised concerning human cloning (reproductive cloning) that might justify its regulation. To do so, this paper will study briefly the popular folklore surrounding cloning, the current state of the law in Britain, some of the potential benefits of cloning (if any), and attempt to address the moral and ethical dilemmas that support its prohibition. This discussion intends only to highlight how the debate on human cloning challenges the traditional vision of reproduction and its ruling, but – above all – that it is an arena where a democratic approach seems bereft of any meaning.

What do we know about cloning?

Since Herbert J. Webber coined the word "clone" in 1903 to describe "a colony of organisms derived asexually from a single progenitor"[iv], the popular understanding of cloning has changed dramatically. One of the biological breakthroughs of the late 1990s considerably helped to change this in the public perception: the cloning technology that in February 1997 gave us Dolly the sheep[v]. From the moment of its birth, as Lee Silver states, "the world had a name and an image to attach to the *Promethean-like* power of bioengineering"[vi]. From this very moment, we all understood that if sheep could be cloned then so too, in principle, could human beings.

Arlene J Klotzko, in her book *The Cloning Sourcebook*[vii], emphasises how important it is to make a rigorous analysis of the possibilities that cloning technology provides, and how biased any investigation might be if a neutral scientific view is not seriously taken. She points out a significant difference between US and British newspapers' reports on cloning, giving details on how little scientific facts are revealed on this side of the Atlantic. Inspired by Klotzko's words, a careful definition of terms is needed for any further discussion on cloning.

When applied to humans, we distinguish between:

1) Cloning by embryo splitting:

Cloning embryos by "cell mass division" (CCMD) or "twinning" – a "blastomere separation", or "embryo multiplication" (Cohen, Tomkin, 1194)[viii] – involves division of a single embryo, in which case both the nuclear genes and the small number of mitochondrial genes would be "identical". This is the technique said to have taken place in 1993 at the George Washington Medical Centre when Jerry Hall and Robert Stillman cloned human embryos for research[ix].

2) Cloning by nuclear replacement

Cloning by "nuclear replacement" (CNR) – also known as renucleation or nuclear cloning – consists of "taking the nucleus of a cell from the body of an adult and transferring it to an unfertilised egg, and letting it develop" – in which case only the nuclear genes would be "identical"[x]. Dolly is the classical example of the success of this technique in addition to Cc, the

cat cloned at AYM University in Texas and other pigs, mice, goats and cows cloned after Dolly.

The successful use of somatic cell-nuclear-transfer (SCNT) to clone a range of mammalian species[xi] enabled Dr Richard Seed, and later Severino Antinori and Panos Zavos, to alarm the world by announcing their intention to clone humans through the reproductive uses of this technology. Allegations of irresponsibility and immorality abounded. However, on the 3rd of April 2002, Antinori announced he had successfully implanted a cloned embryo into a woman and that she was eight weeks pregnant[xii].

Antinori and Zavos have repeatedly defended their cloning plans by claiming that their project is at a very advanced stage, and that it is a legitimate response to the needs of about 5,000 infertile couples who have requested their assistance[xiii].

From the very beginning of the debate over one of biomedicine's most contentious issues, most scientific and political leaders world-wide responded to the prospect of human cloning with an immediate and vigorous condemnation. Ian Wilmut, who brought us Dolly, joined this general disapproval – with Keith Campbell and Colin Tudge –, in his book *The Second Creation*, maintaining that they considered human cloning "as a rather ugly diversion: as a medical procedure superfluous, and in general repugnant"[xiv].

Despite this general condemnation, some voices still claim some possible benefits from the use of human cloning, and question the circumstances of its prohibition.

The current situation is such that unless a global legislation is established and enforced to prohibit using reproductive regeneration technologies, the question is not if, but when and perhaps where the first human clone will be created. At present, we might not be able to answer these questions. However, in a brief paper like this, we will try to consider: (1) if this would be (legally) possible in the UK; (2) what benefits might the application of reproductive regeneration technology bring us; and (3) what criteria would support its prohibition. A serious reflection on these three issues might bring out the best in bioengineering research, or it might exacerbate the worst that it is already breeding under the surface of the use of reproductive regeneration technologies. Yet it might be a key response in light of the essay question, perhaps just before the day we "meet" that very first clone on the news.

Will we have human clones in the UK? Never? Not yet?

The Human Fertilisation and Embryology Act 1990 set out, initially, the framework for the control of embryo research[xv]. This Act, along with the established statutory body (the HFEA), regulated the creation, use and storage of embryos, but it did not set out unequivocally in legislation the ban on reproductive cloning. A public consultation exercise in 1998[xvi], and the Donaldson Report in August 2000[xvii], recommended that legislation should be introduced to explicitly ban human reproductive cloning. With this purpose, the laconic Human Reproductive Cloning Act 2001 was born.

Indeed, since the Human Reproductive Cloning Act 2001, "the placing in a woman of a human embryo which has been created otherwise than by fertilisation"[xviii] is a criminal offence in the United Kingdom, explicitly punishable by 10 years in prison. Nevertheless, it has been suggested that the current British law regulating human cloning is among the most liberal in the world[xix].

Before the Human Reproductive Cloning Act 2001 was enacted in December 4th 2001, Mason and McCall Smith were openly uncertain whether cloning was illegal in the UK under the HFE Act 1990[xx]. The vague terminology of the Act, along with the highly specialised vocabulary intrinsically attached to issues in the 'new genetics', unsurprisingly failed to make clear limits for prohibiting the creation of human clones.

Korek acknowledged that the nuclear transfer technique was not even encompassed by the HFE Act. The main flaw in the legislation derived from the definition of 'embryo': according to s.1 (1) (a), an 'embryo' requires 'fertilisation'[xxi] – precisely what does not happen with cells "reconstructed" by a nuclear transfer technique. On a strict statutory interpretation, the 1990 Act was – therefore – a vague prevention of 'reproductive cloning' to allow the creation of embryonic human clones for research[xxii].

In their recent Report on *Stem Cell Research* (February 2002)[xxiii], the House of Lords' Select Committee stated that, with respect to human reproductive cloning, it "was never envisaged that it would be permitted under the Regulations"[xxiv]. The Lords were aware that authorising the use of cell nuclear replacement (CNR) techniques for research purposes would be a step on the slippery slope to "reproductive cloning". However, they did not find the risk for unacceptable purposes – that is allowing full development of an embryo generated by CNR and implanted in a woman's uterus – a conclusive argument for prohibiting this entire feat of the 'new genetics' – otherwise (presumably) promising[xxv].

The House of Lords' Select Committee did believe that the Human Reproductive Cloning Act 2001 enshrined the total ban on reproductive cloning in law[xxvi]. However, there was still some scepticism that human cloning may, at some time in the future, be licensed for profitable or other customary reasons. This distrust might be justified if it was acknowledged that embryo research could be undertaken under a license issued by the HFEA. The HFE Act 1990 and the HFE (Research Purposes) Regulations 2001 list eight licensing criteria – not mutually exclusive – that include purposes rather difficult to confine:

(a) “promoting advances in the treatment of infertility; (b) increasing knowledge about the causes of congenital disease, (c) increasing knowledge about the causes of miscarriages, (d) developing more effective techniques for contraception, (e) developing methods for detecting the presence of gene or chromosome abnormalities in embryos before implantation, (f) increasing the knowledge about the development of embryos, (g) increasing knowledge about serious disease, or (h) enabling any such knowledge to be applied in developing treatments for serious disease.”[xxvii]

Based on the loose wording of these criteria, Peter G Wood points out how some are concerned with the possibility that embryo research might fraudulently grant an HFEA licence by concealing its real aim (of human cloning) behind a legitimate purpose[xxviii]. Doubts about the integrity of the scientists, however, and doubts about the capacity of the law to reinforce sufficient protection and a specific statutory prohibition do not help either to maintain the illegality of reproductive cloning or to create a clear mind on the appropriateness of using reproductive cloning technology. Views on the matter would be better supported by a closer look at the foreseeable effects and circumstances that human cloning might offer to humankind.

The advantages of the Second Creation

Antinori and Zavos are not alone in outlining what might be the benefits of cloning. Dr. Brigitte Boissellier, a French biochemist who has presented her findings on human cloning to the National Academy of Science, says that she has been hired by a couple to clone their dead son. Dr Boissellier is a member of the Raelians, a sect which believes that human beings were created by creatures from outer space (the Elohim) by genetic science and “that cloning is the way in which we can pass consciousness along to successive bodies”[xxix]. No matter how incomprehensible this view might seem, it might be argued that it represents a legitimate exercise of the right to procreative liberty or reproductive freedom[xxx]. Following this reasoning, Dan W Brock suggested that if human cloning was a means of reproduction and the choice of an assisted means of reproduction should be guarded, then there was a right to select the means of reproduction through the use of human cloning[xxxi].

Those in support of permitting human cloning may find their best allies among the defenders of the right to reproductive freedom. A society which has embraced free choice as a fundamental value, in light of John Stuart Mill’s account[xxxii], gives great weight to parents’ reproductive rights: according to John A Robertson, “reproductive goals should be respected as a central aspect of people’s freedom to define themselves through reproduction”[xxxiii]. Whether or not this would apply to cloning is arguable. But once the technology is available, as Sheila McLean argues[xxxiv], human cloning will be considered as a means that can serve individuals’ interests in reproduction, and regulations will equally have to protect the right to reproductive freedom and to avoid a discriminatory way of its distribution. Dan Brock maintains that a total ban on reproductive cloning would even violate human rights (the right to reproductive freedom)[xxxv].

Although other ethical objections will be evaluated later in this paper, it might be appropriate to indicate, with SL Floyd and D Pomerantz[xxxvi], that the positive right to

reproduce by cloning does not undoubtedly prevail if we consider two further aspects other than just self-determination and “the right to do with one’s body as one wishes”: first, cloning produces a new person (with foreseeable specific characteristics and possible unforeseeable ones) who is not consulted, and secondly, reproduction involves other people who are not either required or taken into account[xxxvii]

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Claims based on rights, in regard to family, seem rather “individualistic, adversarial, and defensive”[xxxviii]. Hans Tiefel articulates – in this way – how difficult it is to apply rights to future generations, and also perhaps how tactless such a defence could become in affirming human cloning. Whether it is desirable to produce persons by cloning, however, might be better justified by a number of other potential benefits that could “help” families, society, and the development of scientific knowledge:

1. Cloning to benefit families

“There is, for many, a powerful urge to perpetuate their genes through a new generation”[xxxix]. When this all-consuming and natural desire for children is initially frustrated by infertility, a simplistic argument might consider human cloning as the answer that some persons look for. Technically, it would allow women who have no ova or men with no sperm to produce their own biological offspring[xl]. Nuclear transfer and embryo splitting techniques, as Dan Brock and others have pointed out, may also “increase the number of embryos for implantation and improve the chances of successful conception”[xli].

Human cloning might satisfy those couples who prioritise the desire to beget (the most significant one in the *Warnock Report*)[xlii] over other possible aspects of the desire to reproduce[xliii]. It would please individuals who want to clone someone who had special meaning to them, such as a child who had died[xliv]. It would enable the creation of a later twin who would solve the problem of finding a transplant donor with perfect compatibility[xlv]. And it would provide couples with a means of avoiding the risk of transmitting a serious hereditary disease to their offspring when only one party carries the defect[xlvi]. Putting these good reasons to the fore, privacy and respect for autonomy in reproduction issues seem to be relevant points of analysis, as law “could only govern action and not thought or belief”[xlvii] – according to Hobbes’ writings in

the 17th century.

2. Cloning to benefit society

The recent literature on human cloning gives a couple of examples of circumstances in which cloning appeals to be of benefit to society. It has been said that it would enable the duplication of individuals of great talent, genius, character, or other excellent qualities[xlviii]. Although this view represents rather naïve expectations, the hope for clones from exceptional individuals is, for some people, a reasonable ground for cloning. Less ambitious couples would be content with the production of children via cloning because it would enable them to determine what kind of children to have: children with traits that they judge to be desirable, and children with the abilities to have a better chance to be successful in various roles in society[xlix].

3. Cloning to benefit science

Cloning would also provide a significant procedure for making advances in human development and perhaps in medical knowledge[l]. However, the purpose of research in human reproductive cloning is hardly supported solely by the benefit for others when clones (who are unable to give their consent) cannot be produced safely and effectively.

The horror of the Second Creation

Alvin Toffler's 1970 book *Future Shock*, somehow, shaped the current popular understanding of cloning to lead us to believe that "man will be able to make biological carbon copies of himself"[li]. This rather fantastical prediction might make us fear that "the cloning of human beings would fit precisely into Adolph Hitler's world view"[lii]. Furthermore, it might make us think that science is creating "a means of mass destruction" – as expressed by Joseph Rotblat, the British Nobel Prize winner[liii]. No matter how daunting this view may appear, it is indeed no more than a fantasy. No more a nightmare than the dream that makes us think that it will be possible to replicate Bach, Gandhi or Einstein, but in any case a fantasy. And a fantasy is a rather inappropriate defence to impose legal prohibitions. Attempts to legislate on human cloning should find, therefore, a better justification against the arguments which seek a pragmatic solution to this new feat of science[liv]. The purpose of this particular heading will be to analyse some of the unwanted changes human cloning might generate upon society, and on the 'new generation of clones'.

The child welfare objections – consequences in society

One set of ethical concerns about human cloning involves the risks and uncertainties perceived in the current state of cloning technology. It has not yet been tested with humans, and scientists cannot rule out the possibility of mutation or other biological damage[lv]. "At this time, it is morally unacceptable (…) to attempt to create a child using somatic cell nuclear cloning" because it would pose – as The National Advisory Board on Ethics in Reproduction[lvi] states – "unacceptable risks to the foetus and the potential child". However, the ethical issues of greatest importance in the cloning debate do not involve technological failures, but rather the consequences of its success.

We have seen how some arguments tend to affirm human cloning as an expression of reproductive liberty, as a means that can serve couples' interest in reproducing, and to benefit others. Arguments that question moral permissibility of human cloning incorporate, however, some objections that appeal to the welfare of the child. Most of the foreseeable harms to the child's welfare are anticipated complications of the so-called "non-identity problem" that clones might suffer[lvii]: (1) the awareness of their origins; (2) the existence of precise demands and expectations; and (3) the fear of social prejudices towards them.

Parents who would have cloned children, instead of saying "*she's got your looks and my brains*", may have to attribute their children's qualities to whoever provided the nucleus with its genetic information, regardless of the rest of the family. It is difficult to believe that this rather complete genetic history – already unfolded in somebody else – may satisfy the curiosity (and perhaps also the ambitions) of a human creature who was cloned and who – presumably – is concerned about his or her identity and future.

This commonly expressed view is what has been called the right of a person to a "genetic identity"[lviii]. The European Parliament's 1997 resolution declared that every individual has this rightlix. However, it has been argued that uniqueness is not an absolute rightlx. It might not even be an absolute good *per se*, as its privation is not an absolute harm. According to Rosamond Rhodes, multiple children with the same genetic inheritance (clones) certainly might be harmed with confusion or analogies, but the special sharing and intimacy that might be developed between them might also be a blessinglxi. In the same way, the right to an open future – put forward by Feinberglxii and Hans Jonaslxiii – has been questioned: Tooley sustains that one's life can be truly and significantly different from that of other individuals of identical genetic makeup, as it happens to identical twins. However, if we are really concerned with who is truly (literally) the child of a single parent (a genuine unprecedented revolution in human history), we should agree with Lisa Cahill that the advent of this child (his or her identity and his or her future) "should be viewed with immense caution"[lxiv].

Dan Brock says that the "non-identity problem" might remain controversial and unsettled. However, the possible psychological burdens to the cloned child, although speculative, should not be disregarded because of the difficulties to

agree on the existence of the non-identity crisis[lxv]. In benefit of the children who might result from cloning, this final area of contention in the cloning debate should be as much psychological as it is scientific or philosophical[lxvi].

From "identity ambiguities" to a family turmoil

As contended by Cahill, we are more satisfied with the notion of identity if we accept that it is the result of a "biological and social (…) ancestral kinship network"[lxvii]. The range of ambiguities introduced into families by cloning, on the other hand, would awaken (to say the least) uncertain emotions and confusions that we can scarcely begin to imagine.

Cloning humans – as the Report from the UK Select Committee on *Stem Cell Research* points out[lxviii] – would give rise indeed to a whole range of confusing relationships within the family that may also diminish the ethic of responsibilities of the different roles and relationships.

Cloning – it is argued – undermines the structure of the family – or at least the concept of the family as we now understand it – by making identities and lineages unclear[lxix]. On the one hand, the relationship between an adult and the child cloned from this adult could be compared to that of a parent and his or her offspring. Indeed, some commentators have called cloning "asexual reproduction," which clearly suggests that cloning is a way of generating descendants. The clone, in this way, has only one biological parent. On the other hand, from the perspective of genetics, the clone is a sibling, so that cloning is more accurately described as "delayed twinning" rather than as asexual reproduction. The clone, in this way, has two biological parents, not one -- they are the same parents as those of the person from whom that individual was cloned[lxx]. If a child, for example, is the clone of his father (i.e. the cell nucleus of the father was used to produce his son), the child would be the genetic son of his grandparents, the genetic sibling of his uncles and aunts, and the genetic uncle of his cousins. There will not be a biological link to his mother whatsoever!

Cloning thus results in ambiguities. Is the clone an offspring or a sibling? Does the clone have one biological parent or two? The moral significance of these ambiguities lies in the fact that in many societies, including our own, lineage identifies responsibilities[lxxi]. Typically, the parent, not the sibling, is responsible for the child. But if no one is unambiguously the parent who is then responsible for the clone? Insofar as social identity is based on biological ties, will this identity not be blurred or confounded?

At the extreme, we would not only be at the core of a "family turmoil", but at the edge of "the emancipation of human reproduction from any relationship"[lxxii]. Lisa Cahill further contends that cloning would constitute an "unprecedented rupture in those biological dimensions of embodied humanity which have been most important for social cooperation"[lxxiii]. This view would reasonably link individual and social harms that could be roused by human cloning, and it would represent appropriately the voice of those who support the introduction of legislation to ban cloning.

From lifesavers to "products"

A central argument that has been made in favour of cloning is that it might be the answer for an infertile couple desperately seeking a biological child. We have also seen that cloning could be proposed to obtain organs required for transplantation without the risk of rejection[lxxiv]. Any scenario that might represent the latter argument makes what is probably the strongest possible case for cloning a human being, as it demonstrates how this technology could be used for lifesaving purposes. It might be suggested that it would be a "tragedy" to allow the sick child to die because of a moral or political objection to cloning[lxxv]. Nevertheless, we should note that many people would be morally uneasy about the use of a minor as a donor – as an end in itself in Kantian terms[lxxvi] –, regardless of whether the child were a result of cloning. Even if this unease is justifiably overridden by other concerns, the "transplant scenario" may not present a more compelling case for cloning than any other.

Most critics, in fact, decline to engage the specifics of such tragic (and presumably rare) situations[lxxvii]. Instead, they reinforce their case by imagining very different scenarios. Potential users of the technology, they suggest, might be narcissists or control freaks – people who will regard their children not as free, original selves but as products intended to meet particular specifications: perhaps to satisfy financial gains or immoral and exploitative purposes – as Dan Brock mentions[lxxviii]. Even if such people are not genetic determinists (those with the view that genes determine everything about us), their choice to clone will indicate a desire to exert all possible influence over the "kind" of child they produce. The critics' alarm at this prospect has in part to do with concerns about the psychological burdens such a desire would impose on the clone. It also reflects a broader concern about the values expressed, and promoted, by society's reproductive policies: in this way, there is a possibility that human cloning would lessen the value of individuals and undermine the respect for human life[lxxix].

Critics argue that a society that enables people to clone themselves thereby endorses the most narcissistic reason for having children – to perpetuate oneself through a genetic encore[lxxx]. The demonstrable falsity of genetic determinism (by an overwhelming scientific consensus) may detract little, if at all, from the strength of this motive. Although the nature of parental motivation is itself more complex than what the critics often allow, we are justified in saying that regulations which

endorse the actions of couples engaged in cloning will place society in an ambiguous position to protect human life and human dignity[lxxxi].

Conclusion

Once we have understood that genetic determinism is false, we should not be afraid of cloning as a technology which could be responsible for a real army of *Hitlers*, ruthless and merciless extremists who could continue reproducing themselves until they had achieved what the historic Hitler had failed to do.

Reproductive cloning, on the other hand, seems to offer at present, for some people, a sympathetic response to people's suffering (for infertility, disabilities or death).

People, however, might continue to express concerns about the social and moral consequences of the cloning process, about the possible motivations for creating children in this way, and in due course about the interests and rights of human clones – the ultimate 'single-parent children'.

Without a doubt, human cloning is a method for creating human babies with the capacity to make irreversible changes to society. As a consequence of an insatiable appetite for reproduction through cloning, one day we might have to accept imperfect clones or clone markets. If the imperfect products of cloning were not seen as fully human individuals, then we might have to design an insidious form of caste system. A fatal settlement like this in society might be the consequence of confusing the progress of scientific research with the rise of scientific despotism: doing what we can do (technologically), without morally questioning if we should do it.

Halting the human cloning project is thus a moral duty that must also be translated into cultural, social and legislative terms. In a democratic, pluralistic system, the first guarantee of each individual's freedom is established by unconditionally respecting human dignity at every phase of life, regardless of the intellectual or physical abilities one possesses or lacks. In human cloning, on the other hand, this necessary condition of any society begins to collapse: that of treating man always and everywhere as an end, as a value, and never as a mere means or simple object.

All the international organisations – Council of Europe, European Parliament, WHO, UNESCO – have made statements on this subject and agree that cloning by nucleus transfer is illicit when carried out for reproductive purposes. It is illicit in the United Kingdom since the Human Reproductive Cloning Act 2001 was enacted. I submit that its legal prohibition, along with a multidisciplinary debate, is the way forward. It might be suggested that a perfect enforceability of a world-wide ban on human cloning is impossible. The inability to reinforce prohibition, however, does not seem a good enough reason to opt for legalisation in any given context. Not least when the goal in human reproductive cloning is to produce persons at the cost of significant individual and social harms. The established statutory bodies should ensure, therefore, that scientists comply with the law. Whoever wants to gamble with both the predictable and the unforeseen risks of the *Second Creation* should be ready for coping with the consequences and ready for assuming responsibilities. If all they want is to "touch" the intangible secret of creation, perhaps they should also imagine how painful it would be to be bound and have their liver pecked out by an eagle – the punishment that *Prometheus* suffered when he dared go against the authority of the gods.

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