Cloning for Human Reproduction: One American Perspective

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Tis an awkward thing to play with souls.
— Robert Browning[1]

Abstract

The author, an American law professor, believes that whole-body cloning of adult humans will be possible in the near future. He does not believe the procedure should be banned when used as a form of assisted reproduction, but that it should be regulated by the government to ensure proper testing and application. After raising a number of scientific, ethical, religious and legal issues, Professor Chester addresses parentage in light of both old and new concepts of the 'family'. Finally, he focuses on the problem of women as surrogate mothers of clones, arguing in the process that the surrogate, having no real genetic tie to the clone, would have less of a claim to parentage than at least some of the surrogates currently gestating foetuses.

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1 Robert Browning, 'A Light Woman' (1855) reprinted in *The Complete Poetical Works of Robert Browning* (1940) at 267.

1. *Introduction*

When news first broke of Ian Wilmut's cloning of an adult sheep to create 'Dolly',[2] I immediately began to wonder how law and society might treat cloned human offspring if Wilmut's technique became available for human reproduction. Clearly, the cloning of whole humans, particularly — as with Dolly — from an already mature being, raises a host of issues. For me, however, the focus was on the procedure's prospective use as a means of assisted reproduction in humans.

Unfortunately, the public's reaction to news of possible human cloning has for the most part been uneducated. For example, the general public rarely makes the distinction between the human cloning already routinely taking place with embryonic cells and the whole-body cloning from an adult cell made possible by Dolly's case.[3]

In addressing this topic, I am aware that, as an American law professor, I am writing for a largely Australian audience. Although the issues involved are universal, Americans are raised in a legal system somewhat different in important ways than those in other nations, even those that are present or past members of the British Commonwealth. Judicial supremacy and a constitution often allowing individual rights to trump state regulation are two differences that come readily to mind. This second difference, highlighted by what may be an individual's right to procreate, is particularly relevant to the perspective that follows and appears as a *leitmotif* throughout this article. Therefore, it should be understood that this article proceeds from an American perspective; however, it also uses a comparative approach where I think this provides a useful context. Before addressing issues of

2 'Scientists at the Roslin Institute Publish Scientific Breakthrough': <http://www.ri.bbsrc.ac.uk/library/research/cloned.html> (26 Feb 1997). In its official press release, the Roslin Institute, on 24 February 1997, announced the publication in *Nature* of Wilmut and his team's 'successful breeding of cloned sheep through nuclear transfer from differentiated foetal and adult cells. This is a major breakthrough as it is the first time that any mammal has been derived from foetal or adult cells.' 'Every cell in the body originates from a single fertilized egg, which contains in its DNA all the information needed to construct a whole organism. .... [e]ach cell, however specialized, still carries in its nucleus a full complement of DNA': Michael Specter & Gina Kolata, 'After Decades of Missteps, How Cloning Succeeded' *The New York Times* (3 March 1997) at A1, A20; 'When embryonic cells become skin, or heart, or brain, all the genes not needed for these new specialized functions are turned off': John Carey, Naomi Freundlich, Julia Flynn & Neil Gross, 'The Biotech Century: There's a Revolution Brewing in the Lab, and the Payoff will be breathtaking' *Business Week* (10 March 1997) 78 at 88; Wilmut 'extracted cells from the mammary glands of an adult sheep' (78); 'Other cells might have worked too': Richard Saltus, 'Cloning of Sheep Breaks New Ground' *The Boston Globe* (3 March 1997) at A9; then Wilmut starved the cells. Doing so changed the protein structure around the cells' DNA. These proteins determine 'which genes are active or inactive. ... The genes that had been turned off were primed to turn on again' (Carey et al at 88). 'The cell from the donor ewe was treated in a way that rendered it dormant, so its nucleus [was not] dividing. [T]he cytoplasm of the unfertilised egg ... "reprogrammed" the nucleus of the 6 year old cell, turning back the clock' (Saltus at A9). Wilmut placed an adult ewe's mammary gland cell next to an unfertilised egg taken from another ewe from which he had taken the nucleus, and thus all the genes, out. 'One pulse of electricity caused the two cells to fuse, dumping the adult sheep's genes into the egg. Another pulse prodded the [egg] to embark on the journey to make Dolly, the clone' (Carey et al at 89).

regulation, the impact on family, and problems of surrogacy, it will be helpful to understand the method of cloning first used in Dolly's case.

Whole-body cloning by nuclear transplantation is a form of asexual reproduction which soon may be used by either a male or female human being to reproduce (or replicate) his or her genotype.[4] In cloning by this method (the one used for Dolly), an adult, differentiated cell (such as a skin cell) is first starved and rendered dormant. Then it is placed next to an enucleated egg cell from the same species and made to bond with that egg cell by electrical stimulation. When both the DNA of the donor cell and the enucleated egg cell are thereby joined, the

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3 See accompanying text, above n2. This may lead to the apocalyptic visions of a host of science fiction films such as *The Boys from Brazil* (cloning new Hitlers); *Jurassic Park* (dangers of replicating dinosaurs); *Multiplicity* (comedy about a harried man cloning himself); *Sleeper* (cloning [a] dictator from his nose); *Bladerunner* (based on Philip Dick's book *Do Androids Dream of Electric Sheep?*, in which society uses synthetic replicants to do its dirty work): George Annas, 'Cloning: Crossing Nature's Boundaries' *The Boston Sunday Globe* (2 March 1997) at D2; and the most recent of these, *The Sixth Day* (an Arnold Schwarzenegger epic in which the facts about human cloning are again twisted); Books such as Aldous Huxley's *Brave New World* ('embryo cloning... used as a method of social control': Annas, above at D2) also did not help; Law Professor George J Annas argues that '[t]here are much more efficient ways of creating killers or terrorists (or even workers) than through cloning; physical and psychological conditioning can turn teenagers into terrorists in months, rather than waiting some 18 to 20 years for the clones to grow up and be trained themselves. Cloning has no military or paramilitary uses. And even Hitler's genetic twin would himself likely be quite a different person because he would grow up in a radically altered world environment': Annas, above at D2; The public may also be largely unaware of the strides being made in gene study and use. 'Transgenic' animal research is not often in the popular news, but, for example, Alexion Pharmaceuticals Inc., in New Haven, and PPL Therapeutics FLC in Scotland, have already altered pig genes to make hearts, kidneys, and other organs that could be transplanted into humans (Carey et al, above n2 at 90). In July 1997, the same scientists who produced Dolly announced they had 'created a lamb that has a human gene in every cell of its body. ... Animals with human genes could be used, in theory, to produce hormones or other biological products to treat human diseases': Gina Kolata, 'Lab Yields Lamb With Human Gene' *New York Times* (25 July 1997) at 18. Gene manipulation is an everyday occurrence, not a science fiction fantasy. 'In significant ways, cloning is not qualitatively different from pre-birth genetic selection techniques now in widespread use': John A Robertson, 'Human Cloning: Should the United States Legislate Against it? No: the Potential for Good is Too Compelling' (1997) 83 (May) *ABA Journal* 80 at 81. Germany has banned genetic manipulation of the human genome, which would have raised the dreaded spectre of species enhancement. However, 'it may soon become necessary to alter the human genome .... not for enhancement, but to repair ongoing genetic damage caused by the excessive use of pesticides and chemical contamination of water reserves': B Benoit, 'Re-engineering the Species (human)': <http://cac.psu.edu/~gsg109/qs/em02001.htlm> (29 Feb 1996). Finally, some members of the public may be misguided in thinking that human cloning would give one a second chance at life. There is a group called the International Cloning Society, headed by a Dr A D Lafferty, who advertises on the Internet with the slogan: 'Have you ever given thought to the possibility of living again? That's right! Living a new life, all over again, right from the beginning, at some point in the future!' They claim to lobby for 'clonees' to collect data and specimens. International Cloning Society: <http://www.wyattweb.com/ freepage/a/adlafferty@msn.com/home.shtml> (10 June 1997).

4 'Genotype' is all of the DNA in an organism, as compared with 'genome', which is 'the complete genetic make-up of a gamete or cell': National Institutes of Health, *Report of the Human Embryo Research Panel, Vol 1* (1994) at D5.

resulting entity (or clone) carries all of the DNA of the donor's cell's nucleus and a small part of the 'inactive' mitochondrial DNA from the egg cell.[5]

Since a human clone resulting from this or a similar procedure would be a sort of 'delayed genetic twin',[6] an initial conceptual problem arises of whether the clone should be considered a sibling, rather than a child of the cloned individual. While an argument can be made that the clone is of the same 'generation' as the person cloned, I think the age difference alone, at least when the person cloned is old enough to make the choice to have a child this way, should suggest that the two be considered as parent and child. For purposes of this article, I will consider that the person cloned and the clone are of different generations.

If the person wishing to be cloned were male, he would require a female partner or surrogate mother to carry the clone, at least until an artificial womb[7] is created which can carry the child from conception to birth. A female wishing to clone herself might carry the child herself; only if this were impossible, or undesirable, would she have to resort to a surrogate mother or an artificial womb.

At first blush, the case of a married woman wishing to use cloning as a form of assisted reproduction with a consenting husband and willing to carry the child herself seems the least problematic case for society. In a number of states, the birth mother of a child is its legal mother.[8] As with artificial insemination under American statutes such as the one in Massachusetts,[9] the husband of the birth mother would then be considered the legal father of the child, assuming he consented. If such statutes were held inapplicable, there is still in many states a presumption of paternity in the husband for any child born to the wife during the marriage.[10] Unmarried women, single or with partners, as well as married women without consenting husbands, raise special problems addressed later in this article.

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5 For a description of the refinement of this technique, see accompanying text, below nn66-69.

6 National Bioethics Advisory Commission, *Cloning Human Beings: Report of the National Bioethics Advisory Commission* (Maryland, June 1997) at i.

7 In a chapter entitled 'The Artificial Womb: An Escape from the "Dark and Dangerous Place"', Corea examines the not so fruitful history of attempts at building the artificial womb; scientists up to 1985 had not been able to keep foetuses alive for more than 48 hours: Gena Corea, *The Mother Machine: Reproductive Technologies from Artificial Insemination to Artificial Wombs* (1985) at 250–259. However, scientists at Juntendo University in Tokyo, who have been working for years on an artificial womb, announced in July 1997 that they had 'successfully delivered a number of goats from the artificial womb': Bryan Christie & John Von Radowitz, 'Artificial Human Womb "in Ten Years"' *The Scotsman* (18 July 1997) at 1; each embryo was removed from its mother's womb at 17 weeks of gestation and placed in the artificial womb until delivery. A goat's full term gestation is about 20 weeks, which corresponds roughly to the 20th to 24th week in human gestation: Peter Hadfield, 'Japanese Pioneers Raise Kid in Rubber Womb' *New Scientist* (25 April 1992) at 5. One of the goats so delivered has been alive for six years; Professor Yoshinori Kuwabara said that, with 'time and money for experiments, maybe within ten years we will have made the move from animal to humans' (Christie & Radowitz at 1). See generally, Yoshinori Kuwabara, 'Experimental Perinatology — Development of Extrauterine Fetal Incubation System' (1992) 44 (8) *Nippon Sanka Fujinka Gakkai Zasshi* 982.

8 See below n99.

9 MGL c46 at §4B.

10 See, for example, MGL c209C at §6.

The case of a woman not willing or able to carry the clone raises problems of surrogacy, also to be addressed later.

If a married male wishes to clone himself, the least problematic case is obviously the one where his wife consents and she is able to carry the clone successfully. As above, the resulting child would generally be considered to have the wife and her husband as his or her legal parents. Problems involving unmarried males without a consenting spouse are addressed below. As suggested earlier, males wishing to have a child through cloning *must* find a woman to gestate that clone, so one suspects that issues of surrogacy will arise more often in male rather than female cloning.

Of course, surrogacy is already a troubling area in the field of assisted reproduction. A surrogate carrying the clone of a male would be what we now term a gestational, rather than genetic surrogate:[11] the analogy would be to the woman carrying an embryo formed by *in vitro* fertilisation (IVF) from the gametes of the intended mother and father, rather than a woman whose own gamete had joined with that of the intended father. While there is no conflicting *genetic* parental claim in such cases, the woman carrying the clone will still be the birth mother, giving her a potential conflicting claim to parenthood on that basis. Hopefully, by the time cloning becomes a reality, society will have done more than at present to resolve the possible conflicts over parenthood that gestational surrogacy raises.

As we explore the issues raised above, I hope to show that the guiding principles of parental support and responsibility for the children that I developed for the traditional reproductive technologies should be used for human whole-body cloning.[12] This assumes of course that, in time, such cloning will become simply one more method of addressing human infertility: one not sufficiently different from existing technologies to warrant substantially different treatment by law and society. In light of the quick reaction of many institutions, including those of the United States government, that research on human whole-body cloning be banned

11 See below n100.

12 See generally Ronald Chester, 'Freezing the Heir Apparent: A Dialogue on Postmortem Conception, Parental Responsibility, and Inheritance' (1996) *Hous LR* at 967. By 'whole-body cloning' I mean 'somatic cell nuclear transfer cloning': the creation of a whole human being using 'a single somatic cell via nuclear transfer cloning techniques' (above n6 at 2). A somatic cell is 'any cell of an embryo, fetus, child, or adult' not destined to become a sperm or an egg cell. Nuclear transfer takes place when 'the nucleus from a [cell with two chromosome sets, for example, a somatic cell] is fused with an egg from which the nucleus has been removed' (appendix 3).

(and numerous attempts such as the successful one in Australia to ban the procedure altogether)[13], this issue requires the full discussion that I give it below.

Even assuming I can show that much of the public outcry against cloning is unnecessary and that the technique can be seen as simply another tool against infertility, real practical problems remain in getting the organs of the state to regulate such a procedure. To demonstrate this difficulty, one need only turn to the current reluctance of the United States government, at both state and federal levels, to adequately regulate even the most accepted of the existing assisted reproduction technologies.

2. *Assisted Conception: Should the Present Regulative Culture Continue?*

A. Private Ordering or Government Regulation?

The United States has, on the whole, failed to regulate the various reproductive technologies,[14] thus 'medicalising' rather than 'legalising' most procedures by default. Doctors engage with patients in a sort of private ordering of the problems, which stem from these technologies, using the medium of contract. The director of the nation's largest infertility clinic,[15] Dr Joseph Schulman, argued at the Association of American Law Schools (AALS) Conference on Property in June of 1997, that contract accompanied by clear notice of what the various procedures entail resolves most difficulties, at least between the parties.

True believers in conservative economic theory[16] would no doubt state that society's best interests are also served by such private contractual ordering. As patients, doctors, and even surrogate mothers maximise their own individual

13 In the United States, the House of Representatives passed a bill on July 31, 2001 that banned all forms of human cloning. See Sheryl Gay Stolberg, 'House Backs Ban on Human Cloning for any Objective' *The New York Times* (1 Aug. 2001) at A1, A11. This bill has yet to be taken up by the Senate. Previously, President Clinton proposed legislation in June 1997 that 'would ban cloning "for the purpose of creating a child". It directed the National Bioethics Advisory Commission to report in four and a half years on whether the ban should continue': Associated Press, 'Clinton Calls for Human Cloning Ban' *Newsday* (10 June 1997) at A19. In addition, the President also banned the use of federal funds for cloning and 'promised to work with other countries that have banned cloning, [like] Britain, Denmark, Germany, Australia and Spain' (A19). In Australia, s192B of the *Gene Technology Act* 2000 (Cth) specifies that the cloning of a human being is prohibited. The Act defines cloning as 'the use of technology for the purpose of producing, from one original, a duplicate or descendant that is ... genetically identical to the original' (s192B(2)). A violation of s192B could subject its offender to a maximum penalty of 2,000 penalty units or a 10-year prison sentence. In the United States, the Report of the Human Embryo Research Panel by an ad hoc group of consultants to the Advisory Committee to the Director of the National Institute of Health, published in September 1994, set up guidelines with regard to funding pre-implantation human embryo research. Among the 10 categories of research the Report found unacceptable for federal funding are: cloning of human pre-implantation embryos, nuclear cloning, transfer of human embryos for extrauterine pregnancy (above n4 at xix-xx). On the other hand, opponents of a ban on human cloning say risks such as it presents are taken every day in medicine. See Gina Kolata, 'Commission on Cloning: Ready Made Controversy' *The New York Times* (9 June 1997) at A12. A significant example, although involving matters of life or death, would be the experimentation with the baboon heart transplanted into Baby Fae in Loma Linda, California, in 1984.

utilities through the medium of contract, the overall utility of society itself is thereby increased. However, some of the rest of us might be a bit sceptical that society's needs generally mirror those of individuals pursuing selfish goals.

The main contracting parties — the doctors, fertility centres, and patients — are hardly in equal bargaining positions. For the most part, patients are couples desperate to have children, and they may feel that they have no realistic choice but to pay the high fees of fertility clinics and their doctors. Surrogates may be the exploited or the exploiters depending on the situation and fee. While many economists would still see the patients maximising their utilities despite their apparantly unequal bargaining position, such a vision is reached through a bloodless calculus, heedless of the real emotional issues involved. Should society try to better regulate this market to put the contracting parties on a more equal footing?

In 1988 and 1989, two official bodies of the United States government, after extensive study, 'expressed the concern that the fertility industry, a largely unregulated and rapidly growing business, is responsible for the exploitation ... of infertile couples'.[17] Although medical professional groups have taken steps to regulate the industry, 'governmental action has been slow to follow. To a great extent, governmental regulation has taken an ad hoc approach, addressing specific narrow problems as they arise rather than focusing on the broader issues raised by the technologies and their logical consequences.'[18]

According to Professor Eggen, the 'emotional and political nature of the abortion debate has [conflated] many of the true issues associated with the advanced reproductive technologies'.[19] Thus, 'most state legislation in this area

14 See generally, Ronald Chester, 'Double Trouble: Legal Solutions to the Medical Problems of Unconsented Sperm Harvesting and Drug-Induced Multiple Pregnancies' (2000) 44 *St Louis ULJ* 451 (discussing lack of regulation of assisted reproduction in the United States and suggesting that private lawsuits may be the only alternative). Assisted reproductive techniques include: *in vitro* fertilisation, embryo transfer, gamete and embryo cryo-preservation, intracytoplasmic sperm injection: Janet L Dolgin, 'Suffer the Children: Nostalgia, Contradiction and the New Reproductive Technologies' (1996) 28 *Ariz St LJ* 473 at 475 n5. *The Uniform Status of Children of Assisted Conception Act* of 1988 (USCACA) 9B ULA 199 (West Supp 2000) 'is not a surrogacy regulatory act', but rather its purpose is to protect and 'clarify the rights of children born under new technology as well as the rights of the parties' to surrogacy agreements (prefatory note at 200). This Act, which has been adopted in two states (North Dakota in 1989 and Virginia in 1991), is narrow in its scope and provides solely for the best interests of children born under new medical technologies (199, 200). The Act states clearly in its essential principles: 'a woman who gives birth to a child is the child's mother;' the husband of a married woman who bears a child through assisted conception is presumed to be the father of that child, placing the burden on the husband to prove lack of consent; and 'a donor of sperm ... is not to be considered the parent of a child conceived through assisted conception unless there has been some agreement beforehand' (200–201).

15 The Genetics & IVF Institute in Fairfax, Virginia.

16 This theory is best exemplified by the 'Chicago School' of Law and Economics, first made prominent in the works of Ronald Coase, especially his 'The Problem of Social Cost' (1960) 3 *JL & Econ* 1.

17 Jean Macchiaroli Eggen, 'The "Orwellian Nightmare" Reconsidered: A Proposed Regulatory Framework for the Advanced Reproductive Technologies' (1991) 25 *Ga LR* 625 at 628.

18 Id at 667.

19 Id at 668.

[reflects] the erroneous presumption that the issues related to abortion are identical to those raised by IVF'.[20] Likewise, the 'federal government, perhaps also influenced by the ... abortion debate, has left a net legacy of inaction and inattention'.[21]

Professor Eggen believes the private sector has addressed the problems of the new reproductive technologies in a more systematic manner than has the government.[22] 'Yet gaps exist in the scope of private regulation, and enforcement power is lacking.'[23] Because of the reality that private regulation (including occasional lawsuits) will often prove ineffective, I look, although with a sceptical eye, to government regulation to promulgate many of the proposals in this article.

While it is true that 'the [regulatory] bodies must be certain that the interests advanced ... are of a sufficiently compelling interest to warrant' infringing on the constitutional right to procreate,[24] I believe that the societal interest in parental responsibilities toward the children of new technologies, including cloning, is sufficiently important to meet this test. Factors cited by Eggen that militate for more and better government regulation in reproductive technologies including cloning are 'the extent and urgency of [the] problems associated with the particular activity',[25] its 'experimental [not] routine'[26] nature, and the 'extent and effectiveness of existing governmental or professional regulation'[27] with respect to the activity involved. Cloning is now in its experimental stage only with animals and is thus not regulated at the human level at all. Since human cloning raises extensive and urgent problems, a measured consideration of future governmental regulation of it as a clinical procedure seems timely.

B. Other Issues in the Current Context

There are, of course, various costs to society of the widespread use of assisted reproduction. With the huge numbers of children we already produce naturally who have no parents or real home, should we not encourage, instead, more widespread adoption?[28] Of course, as Judge Richard A Posner points out, the real demand in America for adoption is for healthy white babies,[29] and the couples wishing to adopt these may have little chance or have to pay high fees in the black

20 Id at 687.

21 Ibid.

22 Ibid.

23 Ibid.

24 Id at 688. For an extended discussion of why procreation via human cloning would probably be protected as a liberty interest under the United States Constitution, see John A Robertson, 'Liberty, Identity, and Human Cloning' (1998) 76 *Tex LR* 1371 at 1401–1402.

25 Above n17 at 710.

26 Ibid.

27 Ibid.

28 See generally, Richard A Posner, 'The Regulation for the Market in Adoptions' (1987) 67 *BU LR* 59.

29 See Richard A Posner, 'The Ethics and Economics of Enforcing Contracts of Surrogate Motherhood' (1989) 5 *J Contemp Health L & Pol'y* 21 at 22.

or 'grey' market.[30] Usually, it is relatively well off couples who turn to fertility clinics.[31] Meanwhile, the numbers of minority children and children with disabilities available for adoption continue to grow.

I have suggested elsewhere that any right of individuals to procreate, a protection of their autonomy and their liberty interests, should be balanced by financial responsibility for the children created.[32] In fact, as demonstrated by the rise in unconsented sperm harvesting, the American zeal for individual decision-making in assisted reproduction is beginning to take the United States beyond the realm of contract.

A recent article[33] notes that requests are on the increase from women, who are partners of accident victims, who wish to have the victim's sperm harvested while in irreversible coma or immediately after death so that they can try to impregnate themselves. When, as in a few cases recently reported,[34] this is done without the prior

30 Ibid.

31 Since their scope does not include preventive and elective medicine, Medicare and Medicaid do not pay for any assisted reproduction procedures. State statutes vary widely in respect to private insurance mandates. For details, see American Society for Reproductive Medicine, 'State Infertility Insurance Laws': <http://www.asrm.com/Patients/insur.html> (30 May 1997). In the United States in 1993 the average cost of one IVF cycle was $6,233: American Society for Reproductive Medicine, 'Frequently Asked Questions about Infertility': <http://www.asrm.com/Patients/faqs.html#Q6> (15 Aug 1997). The cycle consists of a first stage when the mother to be is given drugs to stimulate hormones to start producing eggs. This usually happens when she signs up for the program; then her eggs are retrieved and, lastly, they get fertilised in a petri dish with the husband's or a donor's sperm and then implanted into her. The cycle may have to be repeated several times before the woman actually gets pregnant and is able to carry the pregnancy to term: telephone interview with Joyce Zeiz, the American Society for Reproductive Medicine (16 Sept 1997).

32 See Chester, above n12 at 979–982, 1019–1022. The constitutional right to procreate was first recognised in *Skinner v Oklahoma* 316 US 535 (1942). In *Skinner*, embezzlers were not subjected to vasectomy as per the state's *Habitual Criminal Sterilization Act*, while those who committed larceny were. The Supreme Court held that the state deprived a category of criminals of 'a right which is basic to the perpetuation of a race — the right to have offspring' (535). See also Robertson, above n24.

33 See Susan M Kerr, Arthur Caplan, Glenn Polin, Steve Smugar, Kathryn O'Neill & Sara Urowitz, 'Post Mortem Sperm Procurement' (1997) 157 (6) *Journal of Urology* 2154 at 2155. For an Australian perspective on posthumous reproduction, see Belinda Bennett, 'Posthumous Reproduction and the Meanings of Autonomy' (1999) 23 *MULR* 28.

34 The University of Pennsylvania conducted a survey, which was published in June 1997, finding that there were 82 such requests for sperm between 1980 and 1995, with 43 requests in a single year (1994–95): Richard Saltus, 'More Kin of Dead Seeking Their Sperm. Ethical Questions Raised on Posthumous Retrieval Without Donor's Consent' *The Boston Globe* (28 May 1997) at A13. 'Most were wives or fiancees of the deceased. But some requests came from family friends, and one each came from a social worker and an intensive care nurse' (A13). The recent case of Mrs Blood in Great Britain brought to the fore the problems connected with the issue of posthumous sperm harvesting. See Glenda Cooper & David Garfinkel, 'Widow Wins Final Battle for Frozen Sperm' *The Independent* (London) (28 Feb 1997) at 2. In that case, a widow fought for two years to be artificially inseminated with her dead husband's sperm. In February 1997, the Human Fertilisation and Embryology Authority finally granted her 'permission to be artificially inseminated in a Belgian clinic'. The authority originally fought the case because of its concern with upholding 'the integrity of the principle of consent' of the dead husband.

consent of the dead male, the harvesting is in no sense contractual, nor is it sustainable under the law of gifts, because there is neither donative intent nor delivery. I see no objection to allowing such harvesting when the male has properly donated his sperm to a partner or contracted with her to produce their child if the male's consent is coupled with financial responsibility on the part of the female and of the dead male's estate.[35] However, unconsented harvesting cuts off the financial (and emotional) connection with the father. I submit that this is neither in the society's best interests, nor in the child's. Because of legal inaction, the decision whether to allow such harvesting has been left to the doctors and the hospitals. Predictably, this has resulted in the procedure being allowed in some cases, and not in others.[36]

3. *Whole-Body Cloning of Adult Humans: Should it be Treated Similarly to Other Forms of Assisted Reproduction?*

While those interested in a contractual ordering of assisted conception may be troubled, as I am, with such unconsented sperm harvesting, the possibility of a whole-body cloning to produce offspring upsets another group entirely, a group we can characterise as holding deep moral and/or religious beliefs about the origins and sanctity of life. While I would join their disapproval if the cloning were unconsented, I am uncertain why cloning for human reproduction, consented to by the affected individual, would be any more morally dangerous than those means we already have.

It is an inescapable fact, however, that even the possibility of consented whole-body cloning has raised the hackles of many.[37] In this article, I will examine the nature of their disapproval to see whether it forms a workable basis to prohibit, discourage, or even criminalise cloning as a method of artificial reproduction. Since cloning will no doubt ultimately be used despite legislative societal efforts to discourage it, what exactly is it that some of us fear?

According to R Alta Charo 'the maintenance of embryos *in vitro* and the prospect of cloning frequently lead to the charge of "playing God" — they permit humans to take over the function of actively intervening to transform a potential baby into an actual baby.'[38] Presumably, Professor Charo is excluding less active interventions such as physician assistance with traditional artificial insemination. Certainly, among actual and potential methods of assisted conception, the embryos produced *in vitro* and the potential for cloning have engendered the most political, religious, and moral opposition.

35 As I have argued in a previous article, the male's desire to sire a child should be coupled with financial responsibilities toward that child: Chester, above n12.

36 See Saltus, above n34 at A13. See generally Chester, above n14. By contrast, in Australia, no federal legislation currently exists regulating assisted conception in general. The issues are addressed on a state-by-state basis. South Australia, Western Australia and Victoria are the only states that specifically regulate assisted reproduction techniques, although others address surrogacy issues. The criteria specified by the legislation of each state are similar in nature, requiring that either one or both partners be infertile, or that the couple runs a substantial risk of having a child with a genetic defect in a natural conception. The legislation also requires those seeking assisted reproduction to be either married or involved in a de facto relationship, although this criterion has been the subject of widespread controversy. All three states ban posthumous reproduction; see, for example, *Human Reproductive Technology Act* 1991 (WA) s23.

If 'playing God' is the objection to cloning, what precisely might this mean and why is it so morally offensive? Those who believe human life begins at conception often claim that fertilisation is the moment at which the 'soul' enters the body.[39] Thus, a clone, which is produced by asexual methods, involving no such 'magic moment', can have no soul. Since there could be no point at which the soul could enter, the clone, at least to many Christians, might be cut off from God and Christ, and might not descend from Adam and Eve.[40]

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37 Even before Dolly was conceived, the issue of assisted reproduction in general had been hotly discussed in many countries. In 1989, the Council of Europe released an information document on Human Artificial Procreation, which revealed that few countries within Europe had reached internal consensus on this topic. Bartha M Knoppers & Sonia LeBris, 'Recent Advances in Medically Assisted Conception: Legal, Ethical and Social Issues' (1991) 17 *Am J L & Med* 329 at 330 (citing Council of Europe Report). However, 12 common points emerged: '(1) access to fertilisation techniques should be limited to heterosexual married couples or to those living in stable unions; (2) clinics and physicians offering these techniques should be subject to medical supervision and regulation; (3) paternity and maternity should be provided for by law for all birth technologies; (4) medical records should be kept and medical records concerning participants should be confidential; (5) embryonic life in vitro should be limited to fourteen days; (6) storage of gametes or embryos should be subjected to time limitations; (7) post-mortem insemination or implantation should be prohibited; (8) commercial surrogacy agencies or intermediaries should be prohibited; (9) the consent of the participants should be obtained and standard conditions of donation should be imposed; (10) reproductive technologies should be free from commercialisation; (11) neither sex selection of embryos, except for sex-linked diseases, nor eugenic selection should be allowed; and (12) extreme forms of genetic engineering (for example, cloning, creation of chimeras, parthenogenesis, inter-species fertilisation) should be prohibited' (330–333).

38 R Alta Charo, 'The Hunting of the Snark: The Moral Status of Embryos, Right-to-Lifers, and Third World Women' (1995) 6(2) *Stan L & Pol'y R* 11 at 31.

39 Id at 16.

40 The issue of human cloning is problematic for many Christian theologians. The debate is a wide one with numerous questions concerning the spiritual source of the clone. When does the soul actually enter the body? Does the human and its clone share one soul, or do they have two separate souls? If we assume that normally created humans are directly connected to God, are clones directly connected as well? Does the clone have any claim to human ancestors, or even Adam and Eve, or is it one step removed from them? In Judaism, and in some Christian theological traditions including Seventh-Day Adventism, the question of when a 'soul' enters the body is not a topic of concern. These traditions do not believe in the mind/body dualism Christians borrowed from Plato: letter from Professor Roger Magnusson, University of Sydney Law School, to the author (21 March 2001) (on file with the author). Thus, in Judaism, for example, life 'begins' only when the child first leaves the uterus. There is no question of a 'soul's' existence before that time. However, foetuses after the first four weeks still have a 'potentiality for life' which makes medical intervention problematic: interview with Professor George Dargo, New England School of Law, Boston, MA (29 March 2001). The concept of when the soul enters the body is more complicated in religions where belief in reincarnation is fundamental. Many practitioners of Eastern religions, including most Buddhists, have accepted the classical Hindu teaching that transmigration of the soul occurs at conception. However, the point at which conception occurs has been the subject of much debate. In any event, there is agreement that there is no single point at which the soul takes residence in the human form. Rather, this process occurs gradually and is not complete until some time after birth. See D Keown & J Hughes, 'Buddhism and Medical Ethics: A Bibliographic Introduction' (1995) 2 *J of Buddhist Ethics* 105.

But can the individual soul enter the potential human at fertilisation?

Reproductive biology reveals that a single fertilised egg can twin (thus creating two babies from one 'unique' embryo); in addition, and perhaps even more conceptually complicating, two different embryos can merge to form a single baby whose body is a mosaic of the two different genetic patterns embedded in the two original embryos.[41]

These changes may occur in the first few days after fertilisation. It is thus difficult to see how a unique human soul can originate at fertilisation: 'genetic completeness and uniqueness [of the fertilised egg] do not entirely correspond to [ultimate] human individuality.'[42]

Perhaps the soul attaches (or life begins) several days or even weeks later than fertilisation, when all the above is sorted out, and we have the developing child's genetic pattern finalised.[43] For purposes of embryo research, the National Institutes of Health Panel published a report by the Human Embryo Research Panel, which drew the line at four weeks from fertilisation;[44] thus, pre-implantation and post-implantation embryos can be used for experimentation until this age. The four-week mark generally coincides with the closure of the neural tube. However, the choice of this age may admittedly be just a political one on the part of the panel and not a true judgment on 'when life begins'. Still, for believers in a soul, this would be a time to choose which is more scientifically plausible than fertilisation.[45] However, according to Charo: 'the same potential [to be born] exists long before fertilisation, in any sperm or egg. What is it about fertilisation

41 Above n38 at 16; Rubenfeld says twinning or 'merging' can happen in the first two weeks from fertilisation: Jed Rubenfeld, 'On the Legal Status of the Proposition That "Life Begins at Conception"' (1990) 43 *Stan LR* 599 at 617.

42 Ibid.

43 'The Roman Catholic Church did not view human life as beginning at the moment of conception until 1869': Elizabeth Spahn & Barbara Andrade, 'Mis-Conceptions: The Moment of Conception in Religion, Science, and Law' (1998) 32 *USFLR* 261 at 264. In 1869 Pope Pius IX with the Apostolicae Sedis adopted the view of immediate animation (the human soul entering immediately upon conception). Before 1869 the Church believed in ensoulment (at the third or fourth month of gestation). 'Most early Christian theologians believed that the immortal soul could only be infused into a highly developed and organised body ...' (270, citing Tauer in Jung & Shannon (eds), *The Tradition of Probabilism and the Moral Status of the Human Embryo. in Abortion and Catholicism: The American Debate* (1988) at 57). From Aristotelian ideas, the early Christians borrowed the idea that an embryo generated from an original state of unorganised matter through a continuous process of organisation (Spahn & Andrade at 270). The human soul — being indivisible and rational — cannot enter an embryo while any twinning or 'merging' is still occurring because it needs enough organ development to have some minimal rational activity. From 1140 to 1917, delayed animation (where the soul enters the foetus' body relatively late in the pregnancy) became the mainstream position of the Church (271). In 1588 the Church changed its position for three years under Pope Sixtus V, when abortion was considered a crime at any time during the pregnancy (272). In 1591 Pope Gregory XIV returned to delayed animation until 1869 (273, citing Jane Hurst, *The History of Abortion in the Catholic Church* (1989) at 19).

44 Above n4 at xix. Among the 10 researches unacceptable for federal funding is 'research beyond the onset of closure of the neural tube' (xix). 'The Panel understood that if an embryo is morally equivalent to a child, it cannot be subject to harmful experimentation' (above n38 at 15).

that [arguably] changes the status of the entity? It must be more than mere genetic completeness and uniqueness.'[46]

The reality that pre-fertilisation gametes just like post-fertilisation entities have the potential to produce babies undermines the 'potentiality for life' focus that the Supreme Court of the United States slipped into *Webster v Reproductive Health Services* in 1989.[47] So the *potentiality* for life outside the womb cannot really be the test of when protectable life begins.

This understanding has relevance to the question of cloning. Once whole-body cloning by nuclear transplantation (the procedure used to produce Dolly) is perfected in humans, 'any skin cell could now develop into a baby if it were placed in a enucleated egg cell.'[48] The 'potentiality for life' test would then require that 'every skin cell has a right to life due to its potential for development into a baby, albeit with some artificial assistance[.] But even those most committed to the argument from potentiality will say that it is ridiculous to think every cell in our body should be thus protected.'[49]

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45 Above n38 at 16 (arguing that genetic completeness achieved at fertilisation does not necessarily correspond to human individuality). Nonetheless, many believe fertilisation is the place to fix life's beginning because the being has the potential for life. 'Viability' as a marker for personhood is an anomaly because it is 'a measure of our technology, not the foetus' biology' (Rubenfeld, above n41 at 620). '[T]he embryo is a person for its first three days [when embryos can be conceived *in vitro* as well as *in utero*, making the foetus allegedly viable at conception], then loses its personhood [because it cannot survive outside the maternal womb at the present level of technology], and then regains it twenty-three weeks later [when there is a possibility for the very premature baby to be put in a life sustaining incubator until he or she can survive on its own]' (621). Right-to-lifers argue that life starts at the moment of genetic completeness, but '[e]very cell in our bodies is genetically complete: every nucleus in every cell spells out the same information about the "entire constitution of the person". Quite plainly, carrying all the necessary genetic information about an individual human being cannot be equivalent to *being* a human being' (625, emphasis in the original).

46 Above n38 at 16.

47 492 US 490 (1989). That case involved a Missouri statute requiring physicians to perform certain tests to determine the viability of a foetus before performing an abortion on a woman the physician reasonably believes to be 20 or more weeks pregnant (492). The Supreme Court's plurality in *Webster* decided that the *Roe v Wade*'s trimester framework (see below n56) should be abandoned because the Supreme Court could 'not see why the State's interest in protecting potential human life should come into existence only at the point of viability, and that there should therefore be a rigid line allowing state regulation after viability but prohibiting it before viability .... [T]he State's interest, if compelling after viability, is equally compelling before viability' (quoting *Thornburgh v American College of Obstetricians & Gynecologists* 476 US 747 (1986) at 795, White J dissenting). *Webster* quotes Justice O'Connor's dissenting opinion in *Thornburgh*, declaring that the '[s]tate has compelling interests in ensuring maternal health and in protecting potential human life, and these interests exist "throughout pregnancy"' (*Thornburgh* at 828, O'Connor J dissenting).

48 Above n38 at 17. This is what Wilmut did with Dolly. For description of Wilmut's technique see above n2.

49 Ibid. 'State tax deductions for dependent children currently apply to a child born alive. Creating legal rights following conception would potentially permit parents to claim miscarried fetuses, fetuses still in utero and perhaps even late menstrual periods as dependent children' (Spahn & Andrade, above n43 at 327).

Charo concludes:

> Since the embryo's status cannot be determined with precision due to fundamental, irresolvable value conflicts, [the Human Embryo Research Panel] should have focused entirely on the already born members of the population and asked whether ethical principles of justice require that one or another of *their interests* [emphasis added] be given preference.[50]

Since we cannot determine biologically an absolute point at which life begins, we ought to focus on the interests of scientists, doctors and infertile couples in determining, in any particular situation, the point at which developing life should be protected.

It is clear that in its early stages, human full-body cloning will involve the destruction of embryos in order to produce the one that develops.[51] This is a major argument against cloning. However, one should consider that in the first weeks of development at least 60 per cent of naturally fertilised embryos fail to attach to the uterine lining and develop.[52] Despite this fact, many have decried cloning's potential for killing embryos just as they did in the case of IVF, which itself results in the production of numerous pre-implantation embryos, many of which are ultimately destroyed.

One commentator raises the question of how the destruction of such potential life can be a wrong if that being, at the time it is wronged, has no ability to perceive itself as wronged.[53] Even if the unwitting embryo cannot itself be wronged, the question arises whether those already born, or even God Himself, might have an interest in the development of that potential to fruition and thus be wronged by its destruction.[54]

These are puzzling dilemmas. It is interesting to note, however, that in the United States both the cloned individual and the embryo *in vitro* produced from two gametes would have more protection from the law than an embryo, however produced, once it is placed in a woman's body.[55] This is because the woman's constitutionally protected liberty interest conflicts with whatever interest members

50 Above n38 at 19.

51 Dolly represents one live and healthy birth out of 277 eggs. See Specter & Kolata, above n2 at A21.

52 Above n38 at 16. See also Deborah Lynn Steinberg, *Bodies in Glass — Genetics, Eugenics, Embryo Ethics* (1997). 'Despite claims by some IVF clinics of success rates upwards of 20 per cent, Gena Corea and Susan Ince found in a survey they conducted in the United States that success rates for IVF treatment are routinely manipulated by clinicians in various ways .... [N]o rates of live birth [were found] higher than 10 per cent, and even those occurred only at the best clinics' (38–39). Christine Gosden, professor of medical genetics at Liverpool University, United Kingdom, member of the Human Fertilisation and Embryology Authority in the UK, states that '7.5 per cent of infants in the UK suffer ... congenital defects, and 1.5 per cent [are] serious. 15 per cent of all pregnancies end in miscarriage' (Christie & Radowitz, above n7 at 1).

53 Above n38 at 16 n61, citing Michael Tooley, 'In Defense of Abortion and Infanticide' in Michael F Goodman (ed), *What is a Person* (1988) at 83–114.

54 See Rubenfeld, above n41 at 611–612.

55 Above n38 at 17 n66.

of society (or God) may have in protecting that embryo. The woman is free to abort the embryo, consonant with the standards announced in *Roe v Wade*.[56]

If it is the constitutional right of the woman not to procreate which trumps the right to life of the embryo at its early stage, would not the perfection of an artificial womb allow us to provide more legal protection for a developing embryo — whether produced by cloning or other methods of assisted conception — then is now the case? In other words, shouldn't those interested in protecting potential life forms at the fertilisation stage be happy if an artificial womb is perfected, because it will obviate the need to protect a woman's liberty interest, which may conflict with the developing child's right to life? Despite the apparent rationality of this position, one suspects that many in the right to life movement would not react this way and would view an artificial womb as yet another attempt by man to 'play God'.

According to Professor Jed Rubenfeld, the 'facts by themselves are not dispositive [as to when life begins]; it is a question of attaching significance to these facts.'[57] He notes, however, that 'the tendency to reify personhood — to imagine it as a thing that comes into existence in a concrete, factual fashion — may be difficult to overcome.'[58] However, we must begin to 'conceptualize personhood in exactly the same fashion as we conceptualize adulthood: as a conclusory term designating a point at which we choose to attach to a developing human a certain moral or legal status.'[59] For example, 'when determining whether a fetus is a person in the context of inheritance or tort law, states' analysis need not, and should not, be the same as for the same determination in the context of abortion.'[60]

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56 410 US 113 (1973). In *Roe v Wade*, the United States Supreme Court balanced the interests of the pregnant woman and the state differently in each of three stages of pregancy. Specifically, the Court held as follows: '(a) For the stage prior to approximately the end of the first trimester, the abortion decision and its effectuation must be left to the medical judgment of the pregnant woman's attending physician. (b) For the stage subsequent to approximately the end of the first trimester, the State, in promoting its interest in the health of the mother, may, if it chooses, regulate the abortion procedure in ways that are reasonably related to maternal health. (c) For the stage subsequent to viability, the State in promoting its interest in the potentiality of human life may, if it chooses, regulate, and even proscribe, abortions except where it is necessary, in appropriate medical judgment, for the preservation of the life or health of the mother' (164–165). However, compare *Planned Parenthood of Southeastern Pennsylvania v Casey* 505 US 833 (1992).

57 Rubenfeld, above n41 at 618. The beginning of life is best described as a continuum, from coitus, to zygote (the fertilised egg), to morula (about eight cells travel down the fallopian tube to the uterus and when they get there they constitute about 16–32 cells), to blastocyst (when after about four days of floating in the intrauterine fluid the organism is able to implant, which occurs about seven days after ovulation), to embryo, and finally to foetus (Spahn & Andrade, above n43 at 41–42). Certainly, however, the four-eight cell frozen pre-implantation embryos such as those at issue in the well known Tennessee case of *Davis v Davis* (divorced wife wants to implant frozen embryo produced by her and her husband over the husband's objection), are far from the viability recognised for personhood in *Roe* and *Webster*. See *Davis v Davis* 842 SW2d 588 (1992) at 595, *cert. den* 113 SCt 1259 (1983).

58 Rubenfeld, above n41 at 618.

59 Id at 619.

60 Ibid.

Rubenfeld observes that '[i]f the state were permitted to rely on the claim that God infuses a human soul into every fertilised egg, our analysis would change dramatically.'[61] Thus, '[a]n 'ensoulment' claim would present a powerful, indeed essentially unanswerable, basis for states to choose conception[62] as the moment of personhood. But religious tenets cannot be relied upon in this context.'[63] Indeed, 'if the question were solely a matter of religion, then the [constitutional clause prohibiting an established religion] would preclude states from enacting any particular answer into law.'[64]

To many with moral objections to cloning, IVF with its risk of destruction to embryos and pre-embryos is also objectionable. Yet, it is clear from the recent public outcry that cloning is objectionable to a wider range of people, and the opposition is even more intense than it was to IVF.[65] Why might this be true?

First, the fertilisation of the egg *in vitro,* although clearly artificial, can be said to mimic to some extent natural reproduction. After all, a sperm cell, with one set of Deoxyribonucleic Acid (DNA), fertilises an egg with a different set. In cloning by the 'Dolly' method, a differentiated cell (eg, from her skin) would be made to bond by electric stimulation with an enucleated egg cell of another.[66] When both the DNA from the donor cell and an enucleated egg cell are joined, the resulting entity carries the DNA of the donor nucleus and a small fraction of a different type of DNA from the egg cell's cytoplasmic mitochondria.[67] The latter does not, however, contain genetic instructions for the development of the resulting embryo.[68] If this inactive mitochondrial DNA is not considered, each clone carries

61 Id at 625. Rubenfeld notes that fertilisation does not necessarily equal conception (625 n112). The American Medical Association (AMA) considers conception as a process complete upon implantation. See E Hughes (ed), *Obstetric-Gynecologic Terminology* (1972) 299 at 327. The corollary to this is that the process of conception begins with fertilisation. Other definitions distinguish fertilisation from conception, calling fertilisation the egg and sperm's fusion and conception the implantation of the fertilised egg into the walls of the uterus, which generally occurs about a week after a male ejaculation (see Spahn & Andrade, above n43 at 39–43). However, 'current medical research does not pinpoint any particular moment at which scientists agree human life begins' (21).

62 Many state statutes leave this term undefined.

63 Rubenfeld, above n41 at 625.

64 Id at 614.

65 Above n6 at ii.

66 For a description of the process employed by Wilmut in the creation of Dolly, see above n2. A more refined technique was used in Hawaii in 1998 to clone mice successfully. In this technique the nucleus of a mouse cell that was naturally dormant and thus did not have to be starved (as with Dolly) was actually injected into the enucleated egg cell of another mouse. Since mice bear important similarities to humans in that the cytoplasm of the enucleated host cell has less time to reprogram the adult cell bonding with it (because proteins develop more quickly in mice and humans than in sheep), the breakthrough with mice is quite significant. See 'Dolly and Other Cloning Breakthroughs Since 1996': <http://www.worldbook.com/fun/bth/cloning/html/dolly.html> (11 Feb 2001).

67 Mitochondria are 'small, spherical to rod-shaped components (organelles) of the cytoplasm; they are the principal sites of the generation of energy resulting from the oxidation of foodstuffs' (above n4 at D-6). Cytoplasm is 'the contents of a cell other than the nucleus. Cytoplasm consists of a fluid containing numerous structures, known as organelles, that carry out essential cell functions' (D-4).

68 Above n6 at 90.

only the nuclear DNA of its donor, whereas an IVF embryo carries the DNA of both 'parents'.[69] Whether this relatively small difference in the production of the clone from the production of other children (whether artificial or natural) is sufficient to justify different treatment by society is at best debatable.

Many instances of cloning have a similarity to unconsented sperm harvesting in that the *will* to reproduce of only one person is involved.[70] Even anonymous sperm donation used for artificial insemination involves the will of that donor as well as the will of the recipient to procreate. Yet, the major objections to cloning appear to come less from the fact that only one person *wills* the procreation, than from the reality that only one person's genome *is* reproduced and that such reproduction need not involve a sperm cell and a nucleated egg cell at all.

4. *Cloning and the Family*

Assuming cloning technology becomes available as a form of assisted reproduction, how should society and the legal system handle those factors that make it different from other forms of assisted conception? Obviously, one person — male or female — can have himself or herself cloned without the participation or consent of another, except as a surrogate.[71] This reality would strike at the very heart of what we consider 'family', whether the traditional one, or one involving, for example, a lesbian couple. The very idea of partnership in raising a child could be avoided.

As I have indicated elsewhere, I am uneasy with reproduction techniques that cut the resulting child off from the connection — emotional or financial — of a potential second 'parent',[72] Thus, when cloning becomes available, I would like to see it regulated by the government. Given the recent proclivity of the United States Supreme Court to leave such matters to the states,[73] one can assume that for the foreseeable future, such regulation might be left to the state legislatures, and by default to state courts.

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69 In twinning, a type of sexual reproduction, the fertilised egg's genome comes from both parents or donors. When the fertilised egg divides itself into separate eggs, each will have an identical genome. The children resulting from this process will be genetically identical siblings, thus sharing the same nuclear and mitochondrial DNA. Cloning, instead, is made possible by nuclear transfer technology, a form of asexual reproduction. The resulting clone will have the genome of only one parent or donor and will have in common with him or her the same nuclear DNA and no mitochondrial DNA: B Benoit, 'Genetic Cloning vs. Genetic Twinning': <http://www.ncgr.org/gpi/ odyssey/dolly-cloning/cloning_twinning.htlm> (16 June 1997; now removed).

70 For purposes of this simile, we are assuming surrogates are merely neutral gestators with no intent to produce a particular child.

71 There is also the frightening possibility that another could steal this person's cells who wanted to clone from them using that person's genetic material. That possibility raises a host of issues beyond the scope of this paper. (Question raised by Pamela Cole, Faculty Assistant at the New England School of Law, to the author, 14 Feb 2001.)

72 See generally Chester, above n12.

73 The Supreme Court has largely left the abortion issue (and related right-to-die issues) in the hands of the states. See, for example, *Roe*, above n56; *Webster*, above n47; *Cruzan v Director, Missouri Department of Health* 497 US 261 (1990).

'Four states — California, Louisiana, Michigan and Rhode Island — have already banned human cloning, and [in the spring of 2001] Texas may become the fifth.'[74] In Massachusetts, State Senator Marian Walsh has filed one of the bills that would ban human cloning until at least 2004 .... Meanwhile, many nations, including France, Italy, Greece, and Portugal and several states in Australia have banned human cloning.'[75]

At the federal level, the United States' Food and Drug Administration 'has taken the lead in attempting to regulate human cloning [claiming jurisdiction over] biological products, drugs and devices [and insisting that] it has to give permission to scientists before any research can begin.'[76] Until safety concerns are resolved, it won't give that permission.'[77]

Recently, pursuant to a hearing in Congress on whether human cloning should be allowed, Representatives W J Tauzin (R-LA) and James Greenwood (R-PA) have said they would introduce legislation to ban the procedure. President Bush has indicated that he would sign such a bill. Some scientists, however, fear that such a law would ban 'therapeutic cloning', in which embryonic cells would be copied to produce cells, tissue, and organs that could be transplanted without fear of immune system rejection. They are hoping to get a final bill that would ban only non-therapeutic cloning, but wonder whether such distinctions would be made in any final legislation.[78]

If states (or indeed countries) ban whole-body human cloning and/or criminalise it as a form of reproduction, their legislatures will lose their opportunity to regulate it. The technology will likely move 'off shore' or undercover.[79] I hope this does not happen: that although the current outcry may succeed in slowing research, cloning itself will not be widely banned or criminalised.

Who, after all, will seek the use of this technology? Presumably, one group would include individuals whose partner does not want to be involved in reproduction and for whom copying their own genome is preferable, for marital and/or psychological reasons, to becoming biologically involved with the genome

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74 Nancy Gibbs, 'Baby, It's You! and You, and You ...' *Time Australia* (19 Feb 2001) at 46–57.

75 Jennifer Fenn, 'The Ethics of Cloning' *Sunday Sentinel and Enterprise* (Fitchburg, Mass) (28 Jan 2001) at A1, A6. In fact, Australia has also banned human cloning at the federal level. See *Gene Technology Act* 2000 (Cth) §§192B–192D: <http://www.austlii.edu.au/au/legis/cth/consol_act/gta2000162/s192.html> (15 July 2001).

76 Anthony Shadid, 'Debate Flares Over Cloning Humans' *The Boston Globe* (4 April 2001) at D1, D5.

77 Ibid.

78 Ibid. As this article was going to press, the House of Representatives passed a bill banning all human cloning. See Stolberg, above n13.

79 See, for example, above n74 at 48, 52–53 (discussing, for example, the current cloning efforts of the Canadian religious cult called the Raelians). If one or another nation tries to 'crack down' on human cloning, as in the case of IVF, 'procreative tourism' may be undertaken by citizens of the global village 'in order to exercise their personal reproductive choices in less restrictive states': Knoppers & LeBris, above n37 at 333. See also the article by Robert Lee and Derek Morgan elsewhere in this issue.

of another. In other cases, a couple or a member of the couple may want to produce children, but be physiologically unable to do so, either naturally or via other assisted reproductive techniques. By the use of cloning, they could produce a child who at least carried the genotype of one of them. Also, a case might be imagined where both adults are the carrier of a lethal recessive gene and want to avoid, via cloning, the one in four chance[80] present in natural reproduction of producing a fatally diseased child. In still others, a person without any partner might want to use cloning, rather than using donor egg or sperm, to avoid the health risks and genetic uncertainties involved with the use of such gametes.[81]

As noted in the introduction, married men and women who wish to be cloned, and whose spouse consents to the cloning, would appear to present little problem for the regulator if the wife is willing and able to gestate the clone. Current American law should be able to adapt rather easily to accepting the husband and wife as the legal mother and father. If, however, the wife does not gestate the clone, we encounter the surrogacy problems previously mentioned.

If the non-cloning spouse will not consent to the procedure, that spouse should not be considered a parent. In that case, the spouse wishing to clone should be required to undergo counselling before the state allows the procedure. Certainly, major problems for the marriage might be anticipated and thus the non-consenting spouse should be encouraged to participate in the counselling. If the cloning spouse persists and the non-cloning spouse continues to refuse consent, the cloning parent, if allowed to undergo the procedure at all, should be required to undergo further counselling regarding the financial burden he or she will have to bear alone.

80 Above n6 at 79. One of the suggested uses for cloning would be to make copies of an embryo to avoid giving the woman drugs to pump out eggs — a taxing demand on a woman's body — thus lowering the cost of the procedure while somewhat protecting the woman's health. See Gina Kolata, 'For Some Fertility Experts, Human Cloning is a Dream' *The New York Times* (7 June 1997) at A8. Variations on this technique are already possible, if the cloning is not done from adult cells: telephone interview with Dr Andrea Vidali, Assistant Professor in Obstetrics and Gynecology, Columbia University (July 1997). Another suggested exploitation of the cloning technique, although most repugnant to many, would be cloning to create a source of eggs for a woman whose ovaries had failed. A female foetus would be allowed to develop, then it would be aborted and its ovaries removed. The doctor 'would harvest eggs from the fetal ovaries, which would, of course, be genetically identical to the woman's eggs, if she had been able to make them. Then he would fertilize the fetal eggs in the laboratory, allowing the woman to have her own genetic children' (Kolata at A8). This would essentially be a questionable use of spare parts.

81 For example, in a case that received publicity because the victim was a public figure, Judith Billings chose IVF because her second husband had had a vasectomy; however, her donor sperm was infected with HIV and transmitted it to her. Janet Midwinter, 'The Test-Tube Baby That Gave Me AIDS; Judith Billings Longed For a Child, But Her Sperm Donor Carried a Fatal Disease' *Mail On Sunday* (London) (10 March 1996) at 39, 42.

In the case of the unmarried couple, adoption by the non-cloning partner should be encouraged by the state and required if the non-cloning partner wishes to have any parental rights.[82] The cloning partner should then be required to undergo counselling on both the emotional and financial aspects of his or her decision before being allowed to undergo the procedure.

82 If consent by the non-cloning spouse is not sufficient to make that spouse a legal parent of the clone, adoption might be required. Since the clone could be analogised to a child of the cloning parent alone, thus making the non-cloning parent like a step-parent, the following observation may be pertinent: 'Adoption presently requires fairly elaborate intervention by the state, largely through the judiciary, to determine fitness for parentage of the potential adopter(s). Some disposition or relaxation from these rules usually is permitted in cases involving step-parents who have the consent of a natural parent': Walter J Wadlington, 'Baby M: Catalyst for Family Law Reform' (1989) 5 *J Contemp Health L & Pol'y* 1 at 14 n63. The language in most adoption statutes compels a majority of courts to deny adoption petitions filed by same-sex couples because the adoption statute would divest the natural mother of her parental rights should the court confer these rights on her lesbian partner. The statutes only allow one parent of each sex to be a legally recognised parent and thus do not permit two partners of the same sex to share parental rights and responsibilities: John E Durkin, 'Comment: Reproductive Technology and the New Family: Recognizing the Other Mother' (1994) 10 *J Contemp Health L & Pol'y* 327 at 333. This situation should be changed. The demand of lesbian couples for the new reproductive technologies is quite high. For example, a director of a sperm bank in California stated that approximately 40% of his clients were lesbian couples who intend to raise their children in a lesbian co-parent family. See E Donald Shapiro & Lisa Schultz, 'Single Sex Families: The Impact of Birth Innovations on Traditional Family Notions' (1995–6) 24 *J Fam L* 271 at 278. The reality of lesbian couples going through assisted reproduction in order to have children, via cloning or otherwise, becomes more sobering when one actually stops discussing the subject in abstract terms, and attaches names and faces to the people in these new families. In a case famous in Massachusetts, Dr Susan Love and her domestic partner Dr Helen Cooksey, won joint adoption in 1993 of Katie, born to Dr Love with the sperm of a cousin of Dr Cooksey. 'The father, who has no role in the child's day-to-day upbringing and provides no financial support, treats the child as a niece': Laura A Kiernan, 'Lesbian Couple Thrilled Over Adoption Ruling' *The Boston Globe* (12 Sept 1993) at 29. In another case, the Supreme Court of Virginia recognised 'that a lesbian mother is not per se an unfit parent': *Bottoms v Bottoms* 457 SE2d 102 (1995) at 108 (citation omitted). However, the court also recognised that '[c]onduct inherent in lesbianism is punishable as a class 6 felony [in Virginia]; thus that conduct is another important consideration in determining custody'. The court further stated that the burden placed on a child living under such conditions, especially the social condemnation resulting from his living arrangements, will affect the child's interaction with his peers and the community at large (citation omitted). One cannot help wondering whether local morality will always encourage different results in different parts of the country, and whether financial and social status are determinative of the outcome in a number of cases. Had Drs Love and Cooksey not been doctors and financially comfortable, would the court have awarded the joint adoption? By the same token, might the court in Virginia have awarded custody if the mother had not been on welfare and burdened by a dubious past? The situation in Australia was recently examined in *John McBain v The State of Victoria* [2000] FCA 1009. Therein, a Federal Court judge ruled that s8(2) of Victoria's *Infertility Treatment Act* of 1995, which restricts IVF and artificial insemination to married or de facto heterosexual couples, contravened federal sex discrimination laws. See *Sex Discrimination Act* 1984 (Cth) s4. The Commonwealth has now responded by announcing amendments to the *Sex Discrimination Act*. See Margo Kingston & Judith Whelan, 'IVF: Now States May Ban de Facto' *Sydney Morning Herald* (18 Aug 2000) at 1. For a discussion of the case and the proposed amendments to the *Sex Discrimination Act*, see Belinda Bennett, 'Reproductive Technology, Public Policy and Single Motherhood' (2000) 22 *SLR* 625.

In any case where an individual wants to clone without spousal consent (marriage) or adoption (by the partner), the state might even want to consider banning the procedure altogether. First of all, this scenario raises the issues of the lack of emotional and material support from a second parent. Second, it involves significant loss of control by the society over what may be an individual's temporary whim about the joys of child-rearing. Third, if individuals can clone themselves without the involvement of a partner, we do not even mimic in a general way the methods of child rearing that have been present throughout human history. However, given the American emphasis on individual rights, including that of procreation, banning of such procreation might prove politically and constitutionally impossible;[83] if so, mandated counselling on the financial and emotional risks of single parenting in this situation would seem a necessity.

It is often difficult for those in countries other than the United States, such as Australia, to understand the importance of American constitutional ideas such as procreative liberty and the threat they may present to legislation banning or severely restricting the procedure. In the United States, methods such as counselling may be the only constitutionally permissible means to avoid undesirable uses of human cloning.[84] In many nations, by contrast, it would be possible to ban such uses outright or restrictively regulate them.[85]

However, there may be reasons other than procreative liberty to allow cloning, even of single people with or without partners.[86] The National Bioethics Commission raised, in particular, the empathetic case of a sterile person, whose family had been wiped out in the Holocaust, who was the last of her genetic line.[87] Also raised was a scenario in which a person with leukaemia might wish to clone herself to produce a child whose bone marrow could be used as a replacement but would otherwise be raised normally.[88] Cloning for such purposes should, if

83 See Robertson, above n24 at 1401–1402. See also Fenn, above n75 at A6 (excerpts from discussion with Professor Ronald Chester) and Jennifer Fenn, 'Law Makers Tackle the Ethics of Cloning' *The Berkshire Eagle* (29 Jan 2001) at B3 (excerpts from discussion with Professor Ronald Chester).

84 Ibid. If the procedure became available for human reproduction, any person unable to procreate by other means might challenge the legislation as unconstitutionally restricting the right to procreate. Such a challenge might be defeated on the grounds that the right to procreate has not yet been directly upheld when it involves existing artificial means of conception. Although I can imagine a United States court upholding the legislation, it would be tricky to distinguish why other artificial means are constitutional, while cloning is not. If instead all artificial methods, including cloning, were found not to be constitutionally protected, infertile people would no doubt claim, with some justification that they are being denied equal treatment under the law compared to fertile people, a violation of the 14th Amendment to the United States Constitution. While a conservative Supreme Court might ultimately uphold the banning of cloning for reproduction, such a result is by no means foreordained.

85 In Australia, *Gene Technology Act* 2000 (Cth), above n13.

86 For example, *John McBain v State of Victoria*, above n82 (where the Federal Court made an exception to Victoria's *Infertility Treatment Act* 1995 by permitting a single woman access to methods of assisted reproduction).

87 Above n6 at 55.

88 Id at 80.

allowed at all, be limited to retrieval of replaceable tissues, rather than irreplaceable organs.[89]

If it proved constitutionally and politically possible to ban cloning for unattached people or people whose partners would not adopt or consent, cloning where these factors were present might prove minimally acceptable to those who now oppose cloning at all costs, because it still occurs in a 'family' situation. In support of the banning of cloning without the partner's consent or help, it is possible to argue, for example, that no constitutional right to procreate would be involved, since the ban would be only on gene *copying* or replication.[90] If American courts adopted this argument, a state might be able to impose this ban even in unique and compelling situations such as the two mentioned above. Such a ban might also appear to be in the 'best interests' of the resulting child, unless we consider the children who will not be produced. For example, Professor John A Robertson argues that prohibiting a procedure that would otherwise have allowed children to be born is by definition not in the best interests of the children thus denied life.[91]

To recapitulate, I think the wisest course would be for any state or nation not to ban cloning for reproductive purposes, but to retain jurisdiction over it and closely regulate the procedure.[92] On balance, I would argue that a government might require written consent, or adoption if necessary, by a spouse or adoption by a non-spousal partner to allow the procedure in the first place. In the case of a single person or one whose partner does not consent or adopt, the state might consider banning the procedure altogether. In fact, if the banning of some uses of the procedure were found to be politically (and in the United States, constitutionally) acceptable, such a concession might have to be made in order for the state to allow cloning at all.

What should society's posture be in the meantime, while the procedure is being perfected? While one might hope the current American bans on research involving humans would be lifted, this does not seem likely.[93] Thus, the research will

89 See 42 USC §274 (1994). The Public Health and Welfare laws of Title 42 concerning organ transplants provides guidelines and procedures for the establishment of organ procurement and transplant centres, setting the criteria for allocating organs, and adopting standards of quality for the acquisition and transportation of donated organs (§274(b)(2)). The law specifically provides, in part: '(2) The Organ Procurement and Transplantation Network shall — ... (E) adopt and use standards of quality for the acquisition and transportation of donated organs, including standards for preventing the acquisition of organs that are infected with the etiologic agent for acquired immune deficiency syndrome, (F)prepare and distribute, on a regionalised basis (and, to the extent practicable, among regions or on a national basis), samples of blood sera from individuals who are included on the list and whose immune system makes it difficult for them to receive organs, in order to facilitate matching the compatibility of such individuals with organ donors.'

90 According to George J Annas' Testimony Before the Subcommittee on Public Health and Safety, of the Senate Labor and Human Resources Committee (12 March 1997), whole-body cloning is replication not reproduction, above n6 at 95.

91 John A Robertson, Testimony before the National Bioethics Advisory Commission on 13 March 1997, id at 64–65.

92 An analogy can be made to alcohol prohibition in the US (1920–1933), which was widely ignored and contributed to a rise in organised crime.

probably have to be carried on elsewhere, and probably not under optimal conditions. Before the technology becomes available for use, however, we might want to know a few things for certain. For example, will the 'old' DNA used from the cloned individual have defects that would not be present in 'young' DNA? If so, will the clone itself have a shortened or abnormal life?[94] Is cloning, even on a relatively limited scale, bad for the human species: are continually new combinations of DNA necessary for the adaptations to environment required by natural selection for a successful human race?[95] Sound, well-researched answers to such questions, if they militate against cloning, may make humans unwilling to use the technology at all, whatever the law may or may not say.

5. *Cloning and Surrogacy*

Since bans on human research regarding cloning or the funding for it will hamper society's acquisition of such information, it is likely that cloning for reproductive purposes will initially take place despite widespread destruction of trial embryos and possible genetic hazards for the resulting children. Unless an artificial womb is perfected which can carry a child from 'conception' to birth,[96] cloning will also raise related issues of surrogacy. With existing reproductive technologies, surrogacy has already created a muddle. It will be useful here to examine those surrogacy issues that can be expected to evolve with the advent of human full-body cloning.

Initially, one is struck by the notion that claims to parenthood occasioned by surrogacy may be somewhat less difficult to handle with cloning than with other reproductive techniques. After all, if we ignore the inactive mitochondrial DNA in the host egg cell, aren't the claims of one potential parent — the enucleated egg cell donor who probably has no wish to produce this particular child — then eliminated? Yes, but unfortunately it is still conceivable to fashion some sort of parental claim based on this mitochondrial DNA.[97] Then, of course, we are faced with the claims

93 Above n4 at xix.

94 See 'Irresponsible Cloning Plan Appalls Scientists' *Sydney Morning Herald* (12 March 2001) at 2.

95 Darwin argued: 'When many of the inhabitants of any area have become modified and improved, we can understand, on the principle of competition, and from the all-important relations of organism to organism in the struggle for life, that any form which did not become in some degree modified and improved, would be liable to extermination. Hence we see why all the species in the same region do at last, if we look to long enough intervals of time, become modified, for otherwise they would become extinct': Charles Darwin, *The Origin of Species* at 366.

96 But recall comments by Dr Vidali, who stated that there probably never will be an artificial womb that can take over a mother's from fertilisation to delivery. Interview with Dr Vidali, above n80. At the moment, scientists can keep cells for six days after fertilisation (a blastocyst, see above n4 at 9) for no longer than 10 days in a cultured system (Vidali, ibid). At present, the earliest premature babies can survive in an incubator is at 24 weeks and two days.

97 Above n6 at 90.

of the clone's 'parent' and his or her spouse, which, if the nucleic material is transferred into a gestational mother, may conflict with those of two other potential parents: the gestational mother, and if she is married, her husband.[98]

Currently, in the United States surrogacy disputes are governed by a confusing hodgepodge of legal approaches at the state level.[99] To understand these, it is first necessary to distinguish genetic from gestational surrogacy.[100]

Genetic surrogacy, made famous in the *In re Baby M* case,[101] involves a contract whereby a woman agrees, in exchange for money, to become impregnated through artificial insemination and to give up the newly born child to the father. In *Baby M*, the New Jersey court invalidated the surrogacy contract but held for the genetic father and his wife as the intended parents, despite the pleas of the surrogate mother, who had changed her mind.[102] However, '[i]n many states, the woman who gives birth is considered to be the legal mother and her husband [if any] the legal father of any resulting child.'[103]

In gestational surrogacy, 'one woman (the gestational surrogate) agrees to be impregnated with an embryo formed from the fertilised egg of another woman (generally the child's "intended mother").'[104] Usually, the intended mother's egg is united with her husband's sperm through *in vitro* methods, and then implanted in the gestational surrogate's womb. However, in a variation of this procedure, the

98 Ibid. The children of assisted reproduction are 'biotechnological children' (as used by Larry I Palmer of Cornell Law School in his article 'Who are the Parents of Biotechnological Children?' (1994) 35 *Jurimetrics J* 17 at 19) who may have up to five potential parents: 'the sperm and egg sources (genetic parents), the woman who carries the pregnancy and gives birth (gestator or gestational mother), and the people who will raise the child ("functional parents").' See Michelle Pierce-Gealy, 'Comment: Are You My Mother? Ohio's Crazy-Making Baby-Making Produces a New Definition of "Mother"' (1995) 28 *Akron LR* 535 at 542, citing John Lawrence Hill, 'What Does it Mean to Be a "Parent"? The Claims of Biology as the Basis for Parental Rights' (1991) 66 *NYULR* 353 at 355.

99 For example, consider the problem addressed in *Michael H v Gerald D* 491 US 110 (1989). A married woman had an extra-marital affair and got pregnant by her lover (at 113). That man's claim to fatherhood was denied and the woman's husband — the non-genetic father — was deemed to be the child's father (at 118–130). States with statutes that 'address the issue of motherhood in collaborative reproductive arrangements' are: Arkansas, where the biological father is the legal father and the intended mother if married is the legal mother, even if not the genetic mother; New Hampshire and North Dakota, where the woman who gives birth is the legal mother, even if she is not the genetic one, and, if she is married, her husband is presumed the father unless that presumption is rebutted; and Virginia, where, without a judicially pre-approved contract, a woman who gives birth is the legal mother. See Pierce-Gealy, id at 549–551.

100 Todd M Krim, 'Beyond Baby M: International Perspectives on Gestational Surrogacy and the Demise of the Unitary Biological Mother' (1996) 5 *Ann Health L* 193 at 194. In the *Baby M* case 'traditional' or 'genetic' surrogacy was used, because the egg was that of the surrogate mother. In 'gestational' surrogacy, the surrogate mother is merely a host for the embryo formed from the egg of the intended mother, which is usually fertilised by the intended father's sperm.

101 537 A 2d NJ 1227 (1988).

102 Id at 1250, 1261. See also Pierce-Gealy, above n98 at 550 (concerning the effects of surrogacy contracts on parental rights in Virginia).

103 Above n6 at 90.

104 Above n100 at 193.

sperm and egg are obtained from anonymous donors rather than from the intended parents.[105]

Arizona and Utah have specific statutes making the gestational surrogate the mother of the child even though the embryo she is gestating has no genetic relationship to her.[106] It is unclear how many of the other states awarding parenthood to a genetic surrogate would follow these states in the case of a purely gestational surrogate. In Florida, New Hampshire, and Virginia for example, court-approved gestational surrogacy arrangements are specifically validated by statutes to make the intended rearing parents — not the surrogate — the legal parents.[107] As to situations where the intended rearing parents are unrelated to the individuals whose egg or sperm is used, the contributors to such arrangement will have various, 'as yet ill-defined, legal rights and responsibilities with respect to the resulting child'.[108]

Since the law in many states is unclear about the status of contracts regarding gestational and genetic surrogacy, cloning could be expected to add yet another layer of uncertainty. However, if the potential rights of the enucleated egg cell donor founded on the trace of mitochondrial DNA she transfers were disregarded, cloning might have some positive effects on this morass.[109]

Assuming the surrogate is not the donor of the enucleated egg cell, then the potential conflict is only between the donor of the nucleic material (male or female) and the gestational mother, and her husband, if any. If states were to follow Posner's desire that contractual surrogacy be allowed to work through market mechanisms,[110] the nucleic donor could simply bargain with the appropriate female to gestate the clone and this bargain would be upheld. Such a permissive

105 Ibid.

106 Ariz. Rev. Stat. Ann. § 25-218B (2000); Utah Code Ann. § 76-7-204 (3)(a) (1999).

107 Fla. Stat. ch. 742.15 (1997); N.H. Rev. Stat. Ann. § 168-B: (1994 and Supp. 2000); Va. Code Ann. § 20–158D (Michie 1997); see also above n6 at 90.

108 Above n6 at 90.

109 Judge Posner favours an unregulated free market for such arrangements (above n29 at 22). 'Surrogate motherhood is itself a product, in part, of the interference with a market — the market of adoption.' Posner believes that surrogacy contracts will be made as long as people on both sides of the transaction think they will realise a gain from it. The money expended by a couple where the wife cannot conceive will be equal to the benefit derived from having a baby. Likewise, the surrogate mother believes that the money she will receive is greater than whatever medical risks and personal discomfort and trouble she is getting into, including giving up the baby after delivery. In Posner's assessment, the surrogacy agreement is just another business deal following the law of contracts.

110 Id at 22–23.

attitude by the majority of states seems unlikely, however, raising as it does the spectre of women in the 'rent a womb' business,[111] not merely for more embryos produced by existing methods, but for clones.[112]

Feminists seem particularly conflicted about women renting their wombs for child gestation.[113] On the one hand, this may be exploitive of the female gestation. On the other, interference with that woman's procreative and market choices would seem to be paternalistic and inhibitory to her liberty.[114] The former position, when coupled with the reality that the 'exploited' woman would be bearing a clone — not a traditional embryo — might put a damper on any drive to use surrogates in the cloning process, particularly when the views of the Right to Life movement are factored in.

Thus, all in all, the necessity of a surrogate to gestate the clone might militate against the use of cloning even in couples. This possibility leads us to consider whether, by the time human whole-body cloning is perfected as a means of assisted reproduction, an artificial womb might have been created to gestate the clone. One

111 Id at 28 (discussing the argument against surrogate motherhood as just another form of 'baby selling'). For further discussion of surrogacy as a form of 'baby selling', see Krim, above n100 at 215 (citing Barbara Kate Rothman 'On "Surrogacy"' in John Arras & Bonnie Steinbock, *Ethical Issues in Modern Medicine* (4th ed, 1995) at 476. 'The comparison between [indenture] contracts [such as those where young children were hired out as servants up until the nineteenth century and which today would be invalid] and surrogacy is obvious .... Much of the opposition to surrogacy stems from the sense that it resembles contracts-of-indenture (or even slavery).' (Dolgin, above n14 at 485, citation omitted).

112 For a discussion regarding the contracting for and enforceability of surrogacy agreements in the United States, see Shoshana L Gillers, 'Note: A Labor Theory of Legal Parenthood' (2001) 110 *Yale LJ* 691. Of the 50 states, 17 and the District of Columbia have passed legislation regulating the enforceability of surrogacy agreements. Six of these 17 states' legislation specifically recognise surrogacy agreements and hold them to be enforceable: Ark. Code Ann. 9-10-201 (Michie 1998); Fla. Stat. Ann. 742.15 (West 2000); 750 Ill. Comp. Stat. Ann. 45/6 (West 1999); Nev. Rev. Stat. Ann. 126.045 (Michie 1998); N.H. Rev. Stat. Ann. 168-B:4 (1994); W. Va. Code 48-4-16 (2000). Eleven states and the District of Columbia criminalise and/or void surrogacy agreements: Ariz. Rev. Stat. 25-218 (2000); D.C. Code Ann. 16-402 (1997); Ind. Code Ann. 31-20-1-1 (Michie 1997); Ky. Rev. Stat. Ann. 199.590 (Michie 1999); La. Rev. Stat. Ann. 9:2713 (West 1991); Mich. Comp. Laws Ann. 722.855 (West 1993); Neb. Rev. Stat. Ann. 25-21, 200 (1995); N.Y. Dom. Rel. Law 123 (McKinney 1999); N.D. Cent. Code 14-18-05 (1997); Utah Code Ann. 76-7-204 (1999); Va. Code Ann. 20-158 (Michie 1995); Wash. Rev. Code Ann. 26.26.230, 240 (West 1997). Two states criminalise surrogacy agreements, but are silent as to whether such agreements are enforceable: Ala. Code 26-10A-33 (1992); Iowa Code Ann. 710.11 (West 1993).

113 This is a difficult paradigm for feminists. On the one hand, the womb belongs to the woman and she should be free and empowered to make what choices she likes in respect to reproduction; on the other hand, as Deborah Lynn Steinberg remarked about IVF, if assisted reproduction (and therefore surrogacy) 'assumes a disproportionate burden of commitment from women, it also involves the assumption that women should bear the entire burden of physical risk'. Steinberg, above n52 at 50. Gena Corea, a feminist who opposes surrogacy, is concerned that the new reproductive techniques are leaving women behind, robbing them of the traditional motherhood experience because they and their experience are dominated by men (above n7 at 289). 'Woman's claim to maternity is being loosened; man's claim to paternity strengthened.' For an historical perspective on feminist views on surrogacy, see above n100 at 221–225.

114 Above n29 at 28.

might hypothesise that the artificial womb's removal of the difficulties associated with surrogacy could lead to a more favourable climate for the acceptance of cloning as a reproductive method. However, such a womb seems not to be on the immediate horizon and given the political ramifications of eliminating the need for a female in the gestation process, may be quite far in the future. One also questions whether there is sufficient market demand to drive the development of such a complex machine. Even if the demand existed, such machines would likely be extremely expensive, due to their seemingly limited potential use.[115]

6. *Conclusion*

The comments and suggestions made in this article regarding parental and other issues that may arise with the advent of human whole-body cloning are by necessity both preliminary and tentative. The first matter societies must internalise is that such cloning, with or without government aid, may be imminent. Thus, the President's National Bioethics Advisory Commission was only recommending a holding action by suggesting no human experimentation for three to five years. It may not be long before 'off-shore' human experiments and/or those with animals, will be sufficiently perfected to cause governments to take a second look at their bans either on research or on the procedure itself. If this occurs governments should recommend careful steps be taken in order to perfect, within ethical, moral, and legal guidelines, a clinical procedure for the whole-body cloning of humans.

Acceptance of this reality may be difficult for many of us. Moral and religious objections should be respected to the extent possible. Once the clinical procedure becomes relatively safe, however, it would seem that the majority of us must get on with the tricky business of regulating it. As the political debate sharpens, we, as humans, may be able to choose a widely acceptable point at which to begin protecting life, within the time-frame that modern biology has given us. As this point moves further away from simple fertilisation of the egg, some of the ethical and religious problems we are now having with the destruction of pre-implantation embryos in cloning and other assisted conception techniques may be eased. Simultaneously, we should by then be coming to understand that cloning for human reproduction need not involve the horrific 'brave new world' scenarios some are painting.[116]

True clones, after all, will be unique human beings undergoing very different social experiences from their parents. They have not been 'genetically altered' to create a 'master race'; their genomes will simply be copies of ones already in

115 Of course, having a limited number of expensive machines raises issues of access. For example, making the machine available to those wishing to clone might seem a lower priority than, for example, making it available to women reproducing coitally who can no longer proceed with gestation after seven to eight weeks.

116 Consider, for example, the following: 'Cloning, like eugenics generally, would produce, as C.S. Lewis wrote, "one dominant age ... which resists all previous ages most successfully and dominates all subsequent ages most irresistibly." ... [H]umanity is supposed to be an endless chain, not a series of mirrors': George F Will, 'Golly, Dolly! It's the Abolition of Man' *Baltimore Sun* (26 Feb 1997) at 11A.

existence. Moreover, cloning for human reproduction will probably be used mostly in those relatively few situations where other means of assisted conception do not work well, or at all. Thus, I cannot foresee a situation where cloning for human reproduction becomes so widespread as to threaten the proper adaptation of our species under the principles of natural selection.

As our fear of the unknown begins to dissipate, we can begin the arduous process of legally regulating cloning procedures. It is in the hope that this time will soon come, that this article is offered. Once we come to grips with those of our fears that are groundless, we can begin the task of confronting the *real* problems that such advances pose. To do this, it is well to prepare now — to begin the dialogue which will allow us better to control, through legal means and otherwise, the shape of the human future, including those new components of it which science makes possible.