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| Inter-Species Embryos and Human Clones: Issues of Free Movement and Gestation | 2 3 |
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| 1. Introduction | 11 |
| Much of the debate about the permission to create inter-species embryos and human clones is conducted upon the supposition that, whereas it would be unjust to do so for the purposes of achieving live births, it should be permissible to create such embryos for scientific research and destruction. The distinction between the creation of, for example, animal-human hybrid embryos for destructive research and their creation for live birth is relied upon to promote confidence that it is possible to create and undertake research on such embryos without loss or wrong to future generations. It is my contention that given the current state of UK and European law, no guarantees can be given that people with deliberately | 12 13 14 15 16 17 18 19 20 |
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1 compromised origins (e.g. hybrids, cybrids, chimeras and clones) would not be
2 gestated. If this is right, the only way of ensuring that gestation of these compro-
3 mised embryos does not take place, with all the concomitant damage to the indi-
4 viduals created that might be expected, is by way of a blanket ban on the creation
5 of such embryos.

6 The *Human Fertilisation and Embryology Bill* was introduced into Parliament
7 on the 8th of November 2007. The Bill contains a number of controversial pro-
8 posals inter alia expressly permitting the creation of inter-species embryos for
9 research and destruction and increasing the scope for human cloning also for
10 research and destruction. It removes various welfare requirements relating to a
11 child's need for a father. Indeed, many of the alterations to English law envisaged
12 by the Bill reverse the minimal child welfare regulations of the *Human Fertilisa-*
13 *tion and Embryology Act 1990*. It is supposed that the freedom artificially to pro-
14 duce a child is essentially a private contract between the commissioning parties
15 and their technical providers. A discussion of the child's need for a father and the
16 doctrine of reproductive liberty is not undertaken here. Our attention focuses
17 on the question of the creation of inter-species embryos and clones for research
18 and destruction. Our scope is limited to the question of whether the boundary
19 between the creation of compromised embryos for destructive research, and the
20 same to achieve live births, can be sustained in law.

21 **2. Inter-species Embryos and Gestation in the *Human Fertilisation and*** 22 ***Embryology Bill 2007***

23 Clause 3 of the *Human Fertilisation and Embryology Bill 2007* amends section 3 of
24 the 1990 Act, which covers prohibitions governing human embryos. Section 3(2)
25 of the 1990 Act prohibits the placing in any woman of any embryo other than a
26 "permitted embryo." A "permitted embryo" is defined in such a way as to attempt
27 to ensure embryos created by artificial gametes or genetically modified gametes
28 could not be placed in a woman. Permitted embryos include embryos which have
29 been formed by the fertilisation of a permitted egg by a permitted sperm, whose
30 nuclear or mitochondrial DNA has not been altered and that has not had cells
31 added (apart from by division of the embryo's own cells). Permitted eggs are
32 defined as eggs produced or extracted from the ovaries of a woman and permitted
33 sperm as sperm produced or extracted from the testes of a man. These eggs and
34 sperm must also not have been subject to any alterations to their nuclear or mito-
35 chondrial DNA. Similarly, genetically modified embryos or embryos created by
36 cloning are not "permitted embryos" which may be placed in a woman. This is
37 intended to prevent cloning for live birth and supersedes the *Human Reproductive*
38 *Cloning Act 2001*.

39 Clause 4A relates to prohibitions in connection with genetic material not of
40 human origin. A new section 4A is inserted into the 1990 Act to provide that

certain types of embryo, namely inter-species embryos (now dubbed “human admixed” embryos) and include: 1
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- Human-animal hybrid embryos: embryos created using a human egg and the sperm of an animal, or an animal egg and a human sperm or by combining a pro-nucleus of an animal with a human pro-nucleus (section 4A(5)(a)); 3
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- Cytoplasmic hybrids (Cybrids): embryos created by techniques used in cloning, using human cells and animal eggs. The embryos would be mostly human except for the presence of animal mitochondria (see the notes on clause 3 for more information on mitochondria) (section 4A(5)(b)); 6
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- Human transgenic embryos: embryos created by the introduction of animal DNA into one or more cells of the embryo (section 4A(5)(c)); 10
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- Human-animal chimeras: human embryos, altered by the addition of one or more cells from an animal (section 4A(5)(d)). 12
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Clause 4A(2) permits persons to create, keep and use interspecies embryos when such persons are licensed in the terms outlined in the Bill. Clause 4A(1), in particular, prohibits the gestation of interspecies embryos in a woman in the following terms: 14
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- 4A(1) No person shall place in a woman — 18
 (a) a human admixed embryo, 19
 (b) any other embryo that is not a human embryo, or 20
 (c) any gametes other than human gametes. 21

Clause 4A(4) prohibits the placing and gestation of an interspecies embryo in an animal. Importantly, clause 4A(3) stipulates that a licence cannot authorise the keeping or using of an inter-species or “human admixed” embryo after either the appearance of the primitive streak, or the end of the period of 14 days beginning with the day on which the process of creating the human admixed embryo began, “but not counting any time during which the human admixed embryo is stored.” Thus inter-species embryos may be stored (i.e. frozen) by licensed so long as it does not develop beyond the primitive streak or 14 day period. 22
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The prohibition on the gestation of non-permitted embryos and interspecies embryos is used to generate confidence that embryos with compromised origins will not be gestated and reared. It is argued that there ought not to be a blanket ban on the creation of human clones, hybrids, cybrids and chimeras because these embryos are valuable for research purposes. It is supposed that the section 3(2) ban on the placing in any woman of an embryo other than a “permitted embryo” and the clause 4A(1) ban on gestating interspecies embryos is sufficient to ensure that people with these sorts of compromised origins are never born and so never suffer any of the grief and loss that might be expected of such individuals. Is this a reliable supposition? 30
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1 In what follows, certain observations are made about the status of statutory
 2 proscriptions once embryos are in existence. Part of the reason such prohibitions
 3 are unreliable, is that the UK has duties as a member state of the European Union.
 4 These duties threaten the statutory bans she places upon any activity whether or
 5 not reproductive in character. Statutory bans must be read in a manner that does
 6 not conflict with the UK's treaty obligations. This suggests that what might appear
 7 comprehensive and reliable ban is, in fact, no such thing.

8 **3. *R v Human Fertilisation and Embryology Authority, ex parte Blood***

9 *R v Human Fertilisation and Embryology Authority, ex parte Blood*¹ prima facie
 10 suggests that guarantees that there will be no gestation of compromised embryos
 11 are unsustainable. The facts in *Blood* are now familiar. Diane Blood was a woman
 12 who sought use of sperm electro-extracted from her comatose and non-consent-
 13 ing husband's body. She applied to the Human Fertilisation and Embryology
 14 Authority for in vitro fertilisation to create embryos which would then be trans-
 15 ferred to her body for gestation, notwithstanding that her husband had died
 16 without giving consent to such activities. The Human Fertilisation and Embryol-
 17 ogy Authority found that her husband's consent should have been obtained before
 18 this could take place. Diane Blood then appealed on the grounds that she had the
 19 right to receive treatment in other EC member states. The appeal was allowed on
 20 the ground that there was, in the judgement of the Court of Appeal, unlikely to
 21 be a situation ever again in which there would be gametes in storage without
 22 consent. Diane Blood went on to conceive two children by her dead husband's
 23 sperm three and seven years after his death.

24 Posthumous conception, as it is now termed, is familiar practice and is indeed an
 25 accepted part of the *Human Fertilisation and Embryology Bill 2007* (clauses 39, 40).²

26 At the time *Blood* was decided, Article 59 of the EC Treaty placed a prohibi-
 27 tion on restrictions on freedom to provide services within the Union:

28 Within the framework of the provisions set out below, restrictions on freedom to provide services
 29 within the Union shall be prohibited in respect of nationals of Member States who are established
 30 in a Member State other than that of the person for whom the services are intended.³

31 Art. 60 of the EC Treaty stated further that:

32 ¹) [1997] 2 All ER 687.

33 ²) This follows on from the *Human Fertilisation and Embryology (Deceased Fathers) Act 2003* which per-
 34 mits that which was unlawful prior to *Blood*.

35 ³) The EC treaty was amended by the *Treaty of Amsterdam* Official Journal c 340 10 November 1997. See
 36 also Consolidated texts of the EU Treaties as amended by the *Treaty of Lisbon* (Arts. 56 and 57) which is,
 37 on this point identical.

Services shall be considered to be 'services' within the meaning of the Treaties where they are normally provided for remuneration, in so far as they are not governed by the provisions relating to freedom of movement for goods, capital and persons. 1
 'Services' shall in particular include: 2
 (a) activities of an industrial character; 3
 (b) activities of a commercial character; 4
 (c) activities of craftsmen; 5
 (d) activities of the professions. 6
 Without prejudice to the provisions of the Chapter relating to the right of establishment, the person providing a service may, in order to do so, temporarily pursue his activity in the Member State where the service is provided, under the same conditions as are imposed by that State on its own nationals. 7
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In the course of his judgement Lord Woolf supplied a short summary of the findings: 13

[A]lthough the authority's decision was correct that treatment in the United Kingdom could not take place without Mr Blood's written consent, the authority was not properly advised as to the importance of Community law as to treatment in Belgium. Mrs. Blood has the right to be treated in Belgium with her husband's sperm unless there are good public policy reasons for not allowing this to happen. The authority also appears not to have had sufficient regard to the fact that in future it will not be possible for this problem to arise because under English law Mr Blood's sperm should not have been preserved as he had not given his written consent. If the sperm had not been preserved, it could not have been exported. (The court does not criticise the fact of preservation of the sperm in the circumstances of this case (sic)). If the authority decides to reconsider the question of export of the sperm they will *have to decide whether to allow the export or to refuse on grounds which are acceptable according to Community law.*⁴ 14
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In discussing the question of whether Article 59 of the EC Treaty could be relied on to place restriction on the export of sperm, the majority agreed that whilst it was within the remit of the authority to impose restrictions on export in each case it was a question of degree whether the restriction would be justified. In other words the restriction, even if undertaken by statute, could not constitute a blanket ban. 25
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Article 59 cannot, therefore, be relied on as preventing the authority from imposing any restriction on the export of sperm, where a particular direction is sought, and *in each case it is a question of degree whether the restriction is justified* by the considerations to which reference has already been made. This, in the first instance, is a question for the authority. The courts will only intervene in one of two situations. First, where the authority does not comply with the usual administrative law standards which are enforced by judicial review, including directing themselves correctly as to the law. Secondly, where the authority's decision wrongly evaluates the considerations Lord Lester identified to an extent which goes beyond the margin of appreciation Community law allows in the case of administrative decisions of this sort.⁵ 31
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The case has important implications for any new legislation permitting and extending the law in relation to human clones, hybrids, cybrids and chimeras. Articles 49 40
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⁴ *R v Human Fertilisation and Embryology Authority, ex parte Blood* [1997] 2 All ER 687 at p. 704-5. 42

⁵ *Ibid.* p. 704. 43

1 and 50 of the EC Treaty (as amended by the Treaty of Amsterdam) continue to
2 govern the freedom to receive treatment elsewhere in Europe. Given this impor-
3 tant fact, prohibitions on the gestation of human hybrids and other compromised
4 embryos may well need to be regarded with scepticism. With the signing of the
5 Treaty of Lisbon on the 12 of December 2007 these same requirements are to be
6 renumbered again (after the UK's ratification). They will become Articles 56 and
7 57 respectively of the Treaty. The possibility remains then, that once in existence,
8 embryos supposedly subject to a ban on gestation might like the gametes in *Blood*
9 be subject to European freedom of movement requirements. Is this supposition
10 over-anxious?

11 It might be argued that what made the difference in the *Blood* case was the lack
12 of consent to storage and use. The court's reasoning, in the main, surrounded the
13 question of Stephen Blood's failure to give consent to the storage and use of
14 his sperm. Is this distinction relevant where human clones and part humans are
15 concerned?

16 First, it is important to understand that eminent scientists are agitating to remove
17 the consent requirement for the creation, storage and use of human clones and
18 hybrids.⁶ What this means is that consent might, in any case, *not* be a necessary
19 condition of storage and use as it was in the *Blood* case. So the minimal restric-
20 tions that were obtained in the *Blood* case might not hold in respect of clones and
21 inter-species embryos. In short, if the new proposals are adopted, the distinction
22 between embryos for research and those for live birth, will not be relevant as far
23 as the cloned or part human embryo is concerned because either there *will* be
24 such consent to storage or consent will not be needed, as is being urged in Parlia-
25 ment. Without the need for consent to storage much of the intricate reasoning
26 of the Court applied to determine whether Mrs. Blood could gestate her dead
27 husband's children abroad would have been unnecessary. Since there would be
28 no requirement of consent to storage, the principal problem encountered in the
29 *Blood* case would not be present in the hybrid case.

30 Secondly, it should be recognized that even if there are statutory restrictions on
31 export of embryos with compromised origins and consent remains a necessity for
32 storage, these restrictions will be subject, in the words of Lord Woolf to the courts'
33 possible intervention. As Lord Woolf pointed out, the courts will intervene where
34 the authority does not comply with the usual administrative law standards which
35 are enforced by judicial review, including directing themselves correctly as to
36 the law and where the authority's decision wrongly evaluates Community law in
37 the case of 'administrative decisions of this sort.'⁷ *R v Human Fertilisation and*
38 *Embryology Authority, ex parte Blood*, then, suggests that there can be no outright

39 ⁶ Letters, *The Times* 21 January 2008. See schedule 3 of the Bill for the question of consent to storage.

40 ⁷ *Op. cit. Blood*, p. 704.

ban on export.⁸ If the export of sperm is permitted on a case-by-case basis as in *Blood*, having regard to the facts there can be no binding assurance that export of other fertility products like cloned and hybridised embryos would not be possible using the same rationale. Hence a key argument in favour of creating embryos with compromised origins (for research alone) does not hold.

Thirdly, it might be argued that the main difference between the gestation of the gametes of the non-consenting dead and the gestation of clones and hybrids, is that gestation of the latter are contrary to public policy. But this assertion begs the question as to what activities are contrary to public policy. Applying the logic of reproductive liberty to the question at hand, there could be no conceivable ground on which to object to the gestation of hybrids and clones et al. as contrary to public policy. After all, the contract for treatment between service provider and commissioning party would be governed by the doctrine of autonomy and would be isolated from public policy welfare filters. I have expanded this point elsewhere.⁹

Fourthly, it might be argued that the analogy with *Blood* fails because the European Union has adopted a blanket ban on all reproductive cloning. After all, Article 3.2 of the *Charter of Fundamental Rights of the European Union* solemnly proclaims a ban on reproductive cloning. Accordingly, it might be argued, there would be no gestation of clones anywhere else in the European Union. Such was not the position in *Blood*. The principal response to this objection, it should be understood first, is that the prohibition in the Charter covers only reproductive cloning. It does not expressly prohibit the gestation of human hybrids, cybrids and chimeras. So the analogy with *Blood* remains in respect of these compromised embryos. It is true that the *Charter of Fundamental Rights of the European Union* has recently been given certain binding force on 12 December 2007 by virtue of Article 1(8) of the Treaty of Lisbon which provides that Article 6(1) of the *Treaty on European Union* is to be replaced by the following:

The Union recognises the rights, freedoms and principles set out in the Charter of Fundamental Rights of the European Union of 7 December 2000, as adapted at Strasbourg, on 12 December 2007, which shall have the same legal value as the Treaties.

The provisions of the Charter shall not extend in any way the competences of the Union as defined in the Treaties.

⁸ A similar point was made by M.E. Rodgers, "Gametes Storage Consent and Treatment" 1997 3 Web JCLI "The Court of Appeal hypothesised that there would be no more cases of the same nature as Diane Blood's — this may be so, but in clarifying the legislative provisions the court has also established the manner in which these provisions can be avoided."

⁹ Jacqueline Laing, "Artificial Reproduction, Blood Relatedness and Human Identity" *Monist: International Journal of General Philosophical Enquiry* 89 (2006) 548-567. Jacqueline A. Laing and David S. Oderberg, "Artificial Reproduction, the 'Welfare Principle', and the Common Good" *Medical Law Review*, 13 (2005) 328-356.

1 The rights, freedoms and principles in the Charter shall be interpreted in accordance with the general provisions of Title VII of the Charter governing its interpretation and application and with due regard to the explanations referred to in the Charter, that set out the sources of those provisions.¹⁰

4 However, the United Kingdom and Poland have both won the inclusion of a
5 protocol to prevent the full application of the *Charter of Fundamental Rights of the*
6 *European Union* by the European Court of Justice in their countries, although it
7 would still bind the EU institutions and apply to the field of EU law:

8 *Article 1*

9 1. The Charter does not extend the ability of the Court of Justice of the European Union, or any
10 court or tribunal of Poland or of the United Kingdom, to find that the laws, regulations or admin-
11 istrative provisions, practices or action of Poland or of the United Kingdom are inconsistent with the
12 fundamental rights, freedoms and principles that it reaffirms.

13 ...

14 *Article 2*

15 To the extent that a provision of the Charter refers to national laws and practices, it shall only apply
16 to Poland or the United Kingdom to the extent that the rights or principles that it contains are
17 recognised in the law or practices of Poland or of the United Kingdom.¹¹

18 Further, just how the Charter will apply legally to diverse nations remains to be
19 seen. So even in respect of human cloning, the actual application of the Article 3
20 prohibition to member states' legal systems is not yet clear.

21 Fifthly and taking the Blood analogy further, it should be understood that
22 Mrs. Blood was proposing to use a clinic which adopted the same standards as
23 those in the UK, the principal difference being that they did not insist upon the
24 formal requirements as to written consent which were then required here:

25 If treated in Belgium, Mrs Blood is proposing to use a clinic which in general terms adopts the same
26 standards as this country. The one difference being that they do not insist upon the formal require-
27 ments as to written consent which are required in this country. The need for formal requirements is
28 not obvious in this situation.¹²

29 Mrs Blood was, despite these formal requirements in the UK, able to insist upon her
30 rights to receive treatment elsewhere in the EU. Her legal claim was vindicated.

31 Considering the question of gestating hybrids and the like, in the absence of
32 any sensible means of prohibiting export and of policing the activities of other
33 member states, the probability of compromised embryos being gestated else-
34 where, as in the case of *Blood*, remains an unknown. Promises that embryos with
35 compromised origins will not be brought to term are therefore legally dubious.

36 This is not to say that *Blood* was properly decided. Still less does it imply that
37 the EC Treaty *should* be interpreted in such a way as to allow *ad hoc* free move-

38 ¹⁰ Reform Treaty 2007. IGC 2007 (October 2007). Protocol (No 7) — On the Application of the Char-
39 ter of Fundamental Rights to Poland and to the United Kingdom.

40 ¹¹ *Charter of Fundamental Rights of the European Union*.

41 ¹² *R v Human Fertilisation and Embryology Authority, ex parte Blood* [1997] 2 All ER 687 at p. 703.

ment in certain cases as appears to have been done in *Blood*. On the contrary, such an approach would undermine *any* kind of prohibition on gestation, whether or not in pursuance of other European policies¹³ (e.g. the blanket ban on reproductive cloning).¹⁴ What the analysis does suggest, however, is that guarantees that compromised embryos will not be gestated cannot be sustained in law. This in turn implies that the distinction between embryos for research and the same for live birth is one that is equally difficult to rely upon in law or in practice.

4. Rights and Interests of People Created by AR

Research interests often conflict with the interests of the people created by science. Where this is true, the scientific establishment has demonstrated a marked reluctance to attend to the needs of the people it creates. In the UK today, there are numerous individuals seeking knowledge of their origins and access to their kin. Not only is transparency about biological parenting important for the purposes of preventing incest between DC adults,¹⁵ it is, for many, often important to know their race, their biological kin, their medical inheritance, and the manner of their creation. Despite some alterations to the law (in force from 1 April 2005) that make it possible for those fortunate enough to know *that* they are donor conceived to discover their origins when they come of age, the government has done nothing to address the rights of donor conceived people prior to that date.¹⁶ Further, it has announced that despite needing to alter birth certificates generally in order to accommodate civil partners with the removal of references to fathers and mothers, no effort will be made to ensure that people do actually discover that they are donor conceived so as to permit a genuine and free decision on whether or not to investigate one's origins.¹⁷

The comprehensive lack of interest in the rights of donor conceived people is instructive. So too is the secrecy that surrounds the practice. For whereas the doctrine of reproductive liberty and the related doctrine of the primacy of research

¹³ Convention on Human Rights and Biomedicine <http://conventions.coe.int/Treaty/en/Treaties/Word/164.doc> The Council of Europe's Convention on Human Rights and Biomedicine, signed by 31 out of the 45 Council of Europe Member States (but not the UK) states in Article 18 (2) that "the creation of human embryos for research purposes is prohibited."

¹⁴ The United Nations General Assembly took up the Report of the Sixth Committee at its 82nd meeting, held on 8 March 2005 and adopted General Assembly resolution 59/280, containing the *United Nations Declaration on Human Cloning* by a recorded vote of 84 in favour, 34 against and 37 absentions. Britain joined states such as China, Cuba, and Korea and numerous ex-Communist countries in opposing a ban on human cloning. Britain is, in many respects, out of step with its Western partners on many of these issues in biotechnology.

¹⁵ Lord Alton, House of Lords debates on the *Human Fertilisation and Embryology Bill*, 10 December 2007

¹⁶ Rupert Rushbrooke, "Proposals to bring donor-conceived people's birth certification into line with that of all other UK citizens" *Bulletin of Medical Ethics* (this edition)

¹⁷ Since there is substantial secrecy surrounding the practice of donor conception, it cannot be said that the rights of people born of the fertility industry have been satisfactorily addressed.

1 over the rights and interests of future generations is used to create embryos
2 assumed to have no rights, there is little concern for the identity, kinship needs,
3 biological and species connectedness of the people these embryos become. If this
4 continues to be true for people born of donor conception, *a fortiori*, it is likely to
5 be the case for hybrids, cybrids, chimeras and clones. Indeed the very lack of
6 transparency surrounding these practices is likely to be employed to obscure to
7 true nature of the activities being undertaken and to press for a more permissive
8 regime (in respect of gestation). In short, hybrids et al are likely to be in a par-
9 ticularly powerless position. Their existence is predicated upon their being killed
10 when very young, and the logic of the arguments used to create them imply the
11 legitimacy of their gestation. Yet their gestation, is currently regarded as an obvi-
12 ous evil that should be subject to legal prohibition precisely on the grounds that
13 their origins would be deliberately compromised by science. Much could be said
14 about how hybrids and clones are indeed likely to suffer because of their origins,
15 their lack of ordinary biological parents, siblings, generational separateness (in
16 the case of clones) and their sense of solidarity with the human species (in the case
17 of hybrids etc.) but the scope of this paper demands that this broader discussion
18 be limited.¹⁸ For our purposes, what remains of relevance is the general reluctance
19 by those representing scientific and corporate interests to address the needs of
20 people created artificially. This is likely to be true too of hybrids, cybrids, clones
21 and chimeras.

22 The pressures of scientific research are often inimical to the interests of people
23 created artificially. The interests of science readily ignore the grief and loss experi-
24 enced by those whose origins have been knowingly and deliberately compromised.
25 The veil of secrecy that currently surrounds the world of artificial reproduction may
26 well be used to obscure intergenerational problems and to ensure a more liberal
27 regime for gestation purposes. Further, if the rationale behind creating embryos
28 for research is defended upon the twin principles of reproductive liberty and the
29 needs of scientific research, the same rationale can be applied to gestate such
30 embryos. The argument outlined here demonstrates how uncertain are the legal
31 prohibitions on gestation. Accordingly, the distinction between compromised
32 embryos for research and the same for live birth is equally uncertain.

33 ¹⁸ Jürgen Habermas, *The Future of Human Nature*, (Cambridge: Polity Press, 2003), p. 61; Finn Bowring
34 "Therapeutic and Reproductive Cloning: A Critique" *Social Science & Medicine* 58 (2004) 4001-409;
35 Leon R. Kass, 'The Wisdom of Repugnance', *The New Republic*, 2 June 1997: 17-26; also Leon R. Kass
36 and James Q. Wilson, *The Ethics of Human Cloning* (Washington, DC: American Enterprise Institute
37 Press, 1998); Leon Kass, 'L'Chaim and its Limits: Why Not Immortality' *Life, Liberty and the Defense of*
38 *Dignity*, (San Francisco: Encounter Books, 2002); Jeremy Rifkin, *The Biotech Century: Harnessing the*
39 *Gene and Remaking the World* (New York: Jeremy P. Tarcher/Putnam, 1998).

5. Conclusion

A careful review of the law on human fertilisation is undoubtedly necessary. The interests of scientific research are such that there may well be pressure to bring human clones, hybrids and other compromised embryos to live birth. Confidence that the law can prohibit such gestation depends on a legal distinction between the embryos created for destructive research and the same for live birth. The legal implications of the UK's treaty obligations and *Blood* (and other practical matters discussed here only briefly), however, undermine any guarantees that this distinction can be maintained. If so, this legislation would not, after all, provide effective controls over this technology.

