



Southern Cross
BIOETHICS INSTITUTE

"THE PINES" 336 MARION RD, NORTH PLYMPTON SA 5037 POSTAL ADDRESS: PO BOX 206, PLYMPTON SA 5038,
AUSTRALIA

TELEPHONE: (08) 8297 0022 INTERNATIONAL: +61 8 8297 0022 FAX: (08) 8371 1391

DIRECTOR: DR JOHN I FLEMING, BA, ThL (Hons) PhD

DEPUTY DIRECTOR: DR GREG PIKE, BSc (Hons), PhD RESEARCH OFFICER: MRS SELENA EWING, BHSc

EMAIL: sbi@bioethics.org.au WEB: <http://www.bio-ethics.com>

Mr. Elton Humphery
Secretary
AUSTRALIAN SENATE
COMMUNITY AFFAIRS
LEGISLATION COMMITTEE
PARLIAMENT HOUSE
CANBERRA ACT 2600
Tel: (02) 6277 3515
Fax: (02) 6277 5829
Email: community.affairs.sen@aph.gov.au

Thursday, September 12, 2002

Re: Research Involving Embryos Bill 2002

Introduction

Now that the *Research Involving Embryos and Prohibition of Human Cloning Bill 2002* has been split into two sections, we will focus our submission on the *Research Involving Embryos Bill 2002*, since we are in favour of the prohibition of human cloning in all its forms and the banning of other specified practices.

The central purpose of this *Bill* is to regulate destructive research on human embryos. We argue that there are compelling reasons to protect human embryos and instead pursue ethically sound alternative research that has the added advantage of being extremely promising. We also want to emphasise that in ethics and law the distinction between allowing to die and intentional killing is a crucial one which we will expand upon later.

Furthermore, in a broader sense this issue is a test case for how societies will deal with new developments in biotechnology that are likewise morally problematic. Will our collective

moral sensitivities be dulled by allowing the *in principle* destruction of nascent human lives for scientific research?

While the debate leading up to the formulation of this Bill has focussed almost exclusively upon using embryonic stem (ES) cells in potential cures for a range of conditions, the terms of the proposed legislation allow for the use of human embryos for many other purposes. Southern Cross Bioethics Institute has undertaken to catalogue the likely uses by examining current research on embryos worldwide. The accompanying booklet entitled "Human Embryos: A Limitless Scientific Resource? What the *Research Involving Embryos and Prohibition of Human Cloning Bill 2002* really allows", is the result of that work.

Human Embryos

Any decision to conduct research on human embryos created in whatever way or derived from whatever source rests fairly and squarely upon their status. For if they are human beings, no amount of possible benefit derived from their destruction can justify using them in this way. Perhaps one should not even be referring to human embryos as *them*, since they are at the very least *our* offspring.

Even though there are philosophical and theological approaches to the question "When does human life begin?", science is increasingly able to illuminate the details of the earliest stages of development and we consider its discoveries seminal in providing an answer to this question.

What are some of the key new scientific findings that inform this issue?

First, the entry of the sperm into the egg is the definitive moment by which a new entity is formed. Microscopic evidence and chemical changes to the egg and sperm mark the entry as decisive. No other defining moment can be identified as the start. Indeed *in vitro* fertilisation (IVF) depends upon successful fertilisation as the beginning of embryological development. From fertilisation onwards the self-organising behaviour of the embryo is evident, and is quite unlike ordinary processes of cellular replication by which cells multiply. The union of pronuclei - DNA already premixed as it were by meiosis during the formation of egg and sperm - leads to a new and unique amalgamation with a new composition unlike any other.

Second, it is rapidly becoming clearer that embryos are far from a featureless orb of cells, and discovering this scientifically confirms the precise, energy conserving and purposeful nature of physiological processes. It also confirms the intuitive sense that, for the generation of a new human life, how could it be otherwise?

Recent work by Richard Gardner of Oxford University in the UK reveals that the early embryo already shows some asymmetry even at the single cell zygotic stage¹. Earlier work had already shown that the 5-day-old blastocyst has an axis that appears to line up with the later foetus, suggesting that asymmetry is formed at the blastocyst stage². Work by others went earlier still, even identifying the point of sperm entry as the key for determining axis

¹ Gardner, R.L. Specification of embryonic axes begins before cleavage in normal mouse development. *Development* **128**(6):839-847, 2001.

² Gardner, R.L. *et al.*, Is the anterior-posterior axis of the fetus specified before implantation in the mouse? *J. Exp. Zool.* **264**(4):437-443, 1992.

formation³, although this work has been challenged. These authors followed up that work by showing that enough specialisation had taken place in the 2-cell embryo to cause each cell to pursue different lineages in the developmental process⁴.

Third, the early embryo produces a variety of substances for various signalling purposes. Some of these have been known for some time and their role is partially understood, while others such as various growth factors are currently the subjects of research. Austin⁵ notes that the fertilised “egg releases a substance called early pregnancy factor (EPF), which can be detected in the woman’s blood and provides useful information should the pregnancy fail at a later stage”. In the paper to which he refers, the authors note that “early pregnancy factor (EPF) is known to be detectable in sera of pregnant woman within 24 to 48 h after conception”⁶. Austin⁷ also notes that ‘platelet activating factor’ is released by the blastocyst prior to implantation providing another early indication of pregnancy.

An interesting piece of research appearing in *Fertility and Sterility*⁸ showed that if preimplantation embryos were cultured in groups rather than individually, then they had a better chance of implanting. The authors suggest that this finding can be attributed to the “beneficial effects of specific embryo-derived growth promoting factors”, although they were uncertain what those factors were.

All this suggests that early embryonic development is precise. No time is wasted lingering around as a 'clump of cells'. It would seem that the visible manifestations of specialisation are really only evidence of the invisible and unidentified machinations within the cells constituting the embryo, which may be gradually revealed as science refines its observational techniques. With the arrival of new information from the Human Genome Project, it is likely that we will rapidly discover more about the complex, orchestrated and highly directive early stages of human embryonic development that are well beyond microscopic sight.

A corollary of this new understanding of embryological development is that embryonic stem cells may not constitute a homogeneous population and instead may be heterogeneous. This may have implications for their use either in a therapeutic setting or for other research. Furthermore, the removal of one cell from the early embryo for preimplantation genetic diagnosis in IVF programmes, or the direct injection of sperm in intracytoplasmic sperm injection (ICSI), may interfere with the normal processes of early development.

It has often been assumed that the early embryo is undifferentiated or unspecialised and therefore somehow less human and with consequent diminished moral worth. However, these recent findings completely reject that view and replace it with one in which the human embryo is specialising in complex, directed and precise ways from the moment of sperm penetration onwards.

³ Piotrowska, K. & Zernicka-Goetz, Role for sperm in spatial patterning of the early mouse embryo. *Nature* **409(6819)**:517-521, 2001.

⁴ Piotrowska, K. *et al.*, Blastomeres arising from the first cleavage division have distinguishable fates in normal mouse development. *Development* **128(19)**:3739-3748, 2001.

⁵ Austin, C.R., *Human Embryos. The debate on assisted reproduction.* Oxford University Press, New York, 1989, p10.

⁶ Mesroglu *et al.*, Early pregnancy factor as a marker for the earliest stages of pregnancy in infertile women. *Human Reproduction* **3(1)**:113-115, 1988.

⁷ Austin, C.R., *Human Embryos. The debate on assisted reproduction.* Oxford University Press, New York, 1989, p13.

⁸ Almagor *et al.*, Pregnancy rates after communal growth of preimplantation human embryos in vitro. *Fertility and Sterility* **66(3)**:394-397, September 1996.

There have been several other issues raised against according moral status to the human embryo. These are the problem of twinning and recombination, natural embryo loss, the importance of the 'primitive streak', and the significance of implantation.

Twinning

The problem of twinning and recombination actually turns out to be no problem at all, ironically in part because of the possibility of human cloning. For the possibility of humans formed asexually in cloning gives a hint of the way in which twinning could occur naturally. It has been claimed that twinning shows that no individual could have existed prior to the event, since it seemed illogical for two individuals to come from one, and that since twinning does not occur past 14 days⁹, this time is therefore an important marker for the start of individuation. However, if human cloning does happen one day, we would have no difficulty in acknowledging the individuality of the person from whom a new individual was derived. Likewise in twinning we ought to have no difficulty acknowledging the individuality of the embryo from whom another derives. This issue has been dealt with in considerable detail in scientific and philosophical terms by Fisher¹⁰.

Natural Embryo Loss

Natural embryo loss refers to the number of human embryos lost naturally following fertilisation and therefore not making it to implantation. This figure has been variously quoted at between 20% and 80%. The detection of urinary human chorionic gonadotrophin (HCG) as a measure of "chemical pregnancy" was carried out by Miller and co-workers¹¹ and taken as a post-implantation measure from which the authors deduced that 42.8% of embryos were lost, and 57.2% resulted in live births. This natural embryo loss has been taken as evidence for the low or non-existent moral status of the pre-implantation embryo, and hence as a justification for experimentation. It is said that since Nature is so prodigal with human life, then it cannot be of much value. But ultimately Nature is 100% prodigal with human life since we all die one day, and tragically there have been times in human history where 'natural newborn loss' has been extremely high. Besides the fact that there is enormous variation in the claimed figures for embryo loss, and therefore there can be little certainty about actual numbers of embryos lost or the causes of their loss, vulnerability to death does not determine moral status. Furthermore, using natural embryo loss as a justification for destructive experimentation is somewhat like saying because Nature kills, so can we. One needs little imagination to see where that line of argument could lead.

The Primitive Streak

The 'primitive streak' is an alignment of cells at about day 14 that will continue to form the nervous system. Some claim that this indicates a new stage where moral status is present because our brains are really what counts about us, and this is the earliest indication of the formation of the brain. The UK Warnock Committee¹² decided that research on human

⁹ There is some evidence to show that some forms of twinning could occur after 14 days.

¹⁰ Anthony Fisher, OP, *Individuogenesis* and a recent book by Fr. Norman Ford. *Rivista Di Studi Sulla Persona E La Famiglia*. **Anthropotes**, Anno VII, n. 2, December 1991.

¹¹ Miller *et al.*, Fetal loss after implantation – a prospective study. *Lancet* **ii**, 554.

¹² Baroness Mary Warnock was invited by Her Majesty's Government in July 1982 to chair a Committee of Inquiry into the 'social, ethical and legal implications of recent, and potential developments in the field of human

embryos would be allowed up until 14 days, basing this time partly on the appearance of the primitive streak. However, this committee also made the following statement:

While, as we have seen, the timing of the different stages of development is critical, once the process has begun there is no particular part of the developmental process that is more important than another; all are part of a continuous process, and unless each stage takes place normally, at the correct time, and in the correct sequence, further development will cease. Thus biologically there is no one single identifiable stage in the development of the embryo beyond which the *in vitro* embryo should not be kept alive. *However we agreed that this was an area in which some precise decision must be taken, in order to allay public anxiety.*¹³ [Emphasis added]

As Clarke and Linzey note in their critique of Warnock:

... this is a clear case of extrinsic criteria being used to solve a problem which requires the determination of firm and unequivocal intrinsic criteria.¹⁴

It is an example of a shift from the acceptance of the inherent moral value of human life to one in which moral worth can be conferred if desired, or alternatively, denied if desired.

The Warnock's committee's statement was cast in sharper relief by comments made by the UK Professor Martyn Evans at the *Therapeutic Cloning for Tissue Repair Forum* held in Canberra in 1999. Professor Evans said that the decision to choose 14 days of age had more than anything else to do with the fact that this was about the length of time that human embryos could be kept going *in vitro*. Thus did expedience trump scientific fact or philosophical deliberation in the setting of this arbitrary limit before which it was permissible in the UK to destroy embryonic human beings.

Implantation

Implantation of human embryos typically occurs at about day 5 or 6 following fertilisation. It has been argued that this time is significant because it involves a relationship with the mother and that it is only from this time onwards that she provides nourishment to the developing embryo. However, as we have seen by noting the signalling carried out by the embryo, there is clearly already a relationship in place, and that embryo growth and develop in the tubal fluids clearly represents nourishment. Asserting that implantation as the morally significant marker does make it more palatable to destroy unimplanted embryos created *in vitro*, but the assertion does not stack up scientifically or ethically. And if ectogenesis, that is embryonic development in an artificial womb occurs, some may argue that much older embryos or even foetuses could be used since they do not have a direct biological relationship with their mother.

assisted reproduction'. The report of that committee is called the *Report of the Committee of Inquiry into Human Fertilisation and Embryology*, Cmnd. 9314, London, 1984.

¹³Warnock, M (Chairman) *Report of the Committee of Inquiry into Human Fertilisation and Embryology*. (London: HMSO Department of Health and Social Security) Cmnd. 9314, p. 65.

¹⁴Clarke, P.A.B. and A. Linzey, *Research on Embryos: Politics, Theology and Law*. Lester Crook, London, 1988, p. 26.

Personhood

One of the difficulties often encountered when considering the moral status of human embryos is the question of personhood. It is argued that embryos may be human life, but because they are not persons, perhaps only potential persons, then they do not deserve legal protection like other persons. Personhood is said to consist of a certain set of criteria, faculties or characteristics that define when it is present.

There are several difficulties with the concept of personhood as a basis for assigning moral significance.

First, there is no agreement amongst philosophers about how to define personhood, when it begins or ends, or even whether such a concept should apply to some non-human animals. As Michel Meslin notes:

... the concept of person is one of the most difficult concepts to define - even though it is always burdened with hopes and revendications. It is neither a simple fact, nor evident throughout history.¹⁵

Second, because there is no agreement, different philosophers will count in or out different humans because of the presence or absence of personhood. Indeed, down through history there have been circumstances when personhood was denied to certain groups of people, usually for the purpose of withholding their basic human rights. For example, the *Canadian Indian Act 1880* states that "the term person means an individual other than an Indian". Within 5 years this changed. The *Canada Franchise Act 1885* states that "[a person] is a male person, including an Indian and excluding a person of Mongolian or Chinese Race."

In the United States, prior to the abolition of slavery, legal status as persons was denied to slaves. This was exemplified in the case *Dred Scott v Sandford* where Chief Justice Taney of the United States Supreme Court excluded the Negro slave Dred Scott from personhood.¹⁶

As Fleming and Hains note:

The attempts to disenfranchise some members of the human family from moral consideration has led to intolerable abuses of human rights including slavery, genocide, abortion, infanticide, non-voluntary sterilisation, non-voluntary and voluntary euthanasia of human beings.¹⁷

While there is no agreement on personhood, we do have agreement on 'membership of the human family'. This agreement can be found in many places, but most notably in the *Universal Declaration of Human Rights 1948*, which rejects discrimination against any members of the "human family", and requires the "recognition of the inherent dignity and of the equal and inalienable rights of *all* members of the human family." [Emphasis added].

¹⁵ Michel Meslin, "Religious Traditions and the Human Person", in *Concepts of Person in Religion and Thought*, eds Hans G Kippenberg, Yme B Kuiper, and Andy F Saunders, Berlin, Mouton de Gruyter, 1990, at 67.

¹⁶ "Prior to the American Civil War and the antislavery amendments, such decisions as *Dred Scott v Sandford* relegated slaves to the legal status of nonpersons in spite of clear biological evidence of their humanity." John Warwick Montgomery, "Abortion and the Law: Three Clarifications", in *New Perspectives on Human Abortion*, eds Thomas W Hilgers, Dennis J Horan, and David mall, (Frederick, Maryland: University Publications of America, Inc., 1981), 284. Cf *Dred Scott v Sandford*, 19 Howard 393 (1857) and the *Slavery Convention 1927*, Art 1.

¹⁷ JI Fleming and MG Hains, What Rights, If Any, Do The Unborn Have Under International Law? *Australian Bar Review* November 1997, **16(5)**: 181-198.

Article 2 asserts that "*everyone* is entitled to all the rights and freedoms set forth in this declaration, *without distinction of any kind ...*" [Emphasis added]. Article 6 specifically deals with the issue of persons by stating that "*Everyone* has the right to recognition everywhere as a person before the law." [Emphasis added]

Interestingly, the minimal requirement for being treated as a person found in the International Documents, that is, membership of the 'human family', finds a parallel of sorts in science whereby the new human life formed at fertilisation is likewise obviously a 'member of the human family'. Neither science nor the International Documents allow for any separate categorisation of any group of humans.

If human embryos are considered less than human because they have not yet developed their ability for rationality or other capacities, it is of major concern that a similar rationale could be applied to other humans who likewise for reasons of disability do not display those characteristics. This would mean that the status of humans would rest upon their capacities and function rather than just because they are one of us.

Intentional Killing and Allowing to Die

At this stage there is agreement that human embryos should not be deliberately created for scientific research, but that only those destined for destruction should be used, and much has been made of the fact that by law in several states embryos can only be maintained in deep freeze for 5, 10 or 15 years, after which time they must be thawed and hence allowed to die. If they are going to die anyway, why not use them for research?

There are several reasons why we believe this should not happen.

First, the moral difficulties that are inherent in the *ex vivo* production of human embryos and their freezing cannot somehow be balanced up by taking the further step of intentionally killing embryos for scientific or medical gain. While there may be some collective bad conscience for allowing 70,000 embryonic human beings to exist in suspended animation, it will not be salved by using them as research material. Our community has made for itself a 'Sophie's Choice', difficult enough to challenge the Wisdom of Solomon. The crucial element in our current dilemma is that human choice has determined that there will be frozen embryonic human beings. It is not as if we have been presented with a catch-22 created by natural means that we must then solve. It has been human action that has produced 70,000 frozen human lives, even though perhaps at the time with 'eyes wide shut' to the consequences. We decide that they should die, then we say that they are going to die anyway, so we may as well gain some benefit. As Gilbert Meilaender, a member of the US President's Council on Bioethics notes, "the argument seems inherently corrupting."

Second, given our dilemma, there nevertheless remains an option that respects human embryos and does not lead us into further moral and perhaps legal difficulty. However, this option will not allow access to live human embryos because it relies on the important moral distinction between allowing to die and intentional killing. In ethics as in law this distinction is crucial. We would never allow the intentional killing of any individual because 'they are going to die anyway'. Allowing to die happens all the time at the end of life, when treatment is futile or burdensome disproportionate to benefit. In such circumstances, machines can be turned off and treatment stopped, and the person allowed to die from the underlying condition, because keeping them attached to machines may not only be futile and

burdensome, but also contrary to human dignity. This is not intentional killing. Where frozen embryos are concerned, the analogy holds. Embryos in deep freeze that have no prospect of transfer to a woman's womb are being artificially maintained and ought to be allowed to die without interference. Meilaender quotes Han Jonas, who was referring to the terminally ill, that we should spare them "the gratuitousness of service to an unrelated cause."

Allowing embryos to die is quite different from the proposal before parliament to kill embryos for research purposes. Furthermore, it is no defence to say that the act of thawing and its consequence is all that counts, for in law and ethics intention is crucial to the legitimacy of an act.

Any difficulty with this analogy really only becomes apparent if no moral status is afforded the human embryo. But if the moral status of embryos as embryonic human beings is acknowledged, then the analogy with the end of life has powerful import. And if the distinction between allowing to die and intentional killing is lost at the start of life, we may well lose it at the end of life, and then even for selected circumstances in between.

The rationale behind the argument that we should gain some use from embryos that will die has a troublesome pedigree, and the reasoning is similar in form to that used on occasions in the past. Gilbert Meilaender has discussed three examples, two of which follow.¹⁸

First, in the mid-1970s the US Congress established a National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research. In its first report in 1975, "Research on the Fetus", the view was expressed by some members that fetuses which were destined to die by abortion could be researched upon while alive in ways that were totally unacceptable for fetuses destined to live. Those who argued this way based their view on "no additional risk of harm", claiming that one could not further harm a fetus that was going to die anyway, since there could be no greater harm than death.

Second, in the Tuskegee syphilis experiment, US Public Health Officials used poor uneducated black men to study the effects of untreated syphilis. Meilaender makes the crucial point that "we miss some of the complexity of the case, however, if we forget that the poverty, illiteracy and race of these men meant that, even if the research were not undertaken, they almost surely would not have gotten treatment. The circumstances of their lives destined them to suffer from and perhaps die from the complications resulting from syphilis." Nothing would be done for them, so why not at least gain some medical knowledge from their predicament. There would at least be some profit from their condition.

The point here is to make a comparison between the reasoning used in these two examples and how it relates to the reasoning used to justify research on embryos that are destined to die.

It is also true that a principle breached under one set of circumstances makes it so much easier to breach the same principle elsewhere, or even to forge ahead and breach another.

Other Matters

5 April 2002

The prohibition on use of embryos created after 5 April 2002 will be repealed on 5 April 2005 or by declaration of COAG. This means that an agreement of COAG rather than an

¹⁸ Gilbert Meilaender, *Spare Embryos*, *The Weekly Standard*, 7(47), 2002.

amendment by Parliament can allow embryos created after 5 April 2002 to be used in research. This could happen much earlier than 5 April 2005, and would mean that a quite new scenario would unfold. If embryos created at any time and excess to requirements are available to researchers, it would not be difficult to create an excess of embryos by simple changes to practices in IVF clinics. This would in effect constitute the *de facto* production of human embryos deliberately for the purposes of research.

Alternatives to Embryonic Stem Cells

There are good alternatives to using embryonic stem cells. These include umbilical cord blood stem cells and the various populations of somatic or adult stem cells. Furthermore, an enormous amount of research on existing embryonic stem cell lines could proceed without recourse to the destruction of any more embryos¹⁹. There are also other areas of investigation that do not rely on stem cells at all and may prove fruitful in terms of therapeutic application. Because of these alternatives, the claim that embryonic stem cells must be pursued fails.

Nevertheless, the use of embryonic stem cells has been framed by some in terms of necessity. However, when claims are based on necessity, it is often the case that a basic moral principle is being breached. As Daniel Callahan explains, coupling technology with survival produces a technological imperative to go ahead and use the technology because one must do so even in the face of serious ethical problems²⁰. He astutely notes that:

technological development has been subject both to a tyranny of individualism and a tyranny of survival; neither knows how to say No.

The recourse to necessity also implies a proven outcome, which at this stage is not the case with embryonic stem cells. There are however, some proven outcomes with adult and umbilical cord blood stem cells.

Recommendations

The Southern Cross Bioethics Institute recommends that research that is detrimental to any human embryos be prohibited.

Yours Sincerely

Dr John I Fleming
Director
Southern Cross Bioethics Institute

Dr Gregory K Pike
Deputy Director
Southern Cross Bioethics Institute

¹⁹ Even so, using existing embryonic stem cell lines remains morally problematic since it represents a degree of cooperation in the original destruction of an embryo. For many this question has not been adequately resolved and hence it will remain debatable.

²⁰ Daniel Callahan, Science: Limits and Prohibitions, *Hastings Centre Report* 3 (November 1973): 5-7.