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Responses to the Human Embryo and Embryonic Stem Cells: Scientific and Theological Assessments

The prospect of employing embryonic stem cells for research has reignited debate over the status of the human embryo. However, the current debate centres on the very earliest stages of embryonic development, notably on the blastocyst at around 5-7 days' gestation. After a scientific overview of early embryonic development, three theological perspectives are considered. These provide insight into the contrasting ways in which the interrelationship between biblical material, traditional moral positions and scientific concepts on reproduction are currently being approached. In assessing the part biblical perspectives play, four categories of response are outlined and discussed. Of these, the one advocated is that the Bible is one of a number of sources that inform our decision-making, but may not be the predominant one. It is argued that the environment in which blastocysts are encountered has considerable relevance for theological debate, and consequently for acceptance or otherwise of the legitimacy of utilising embryonic stem cells. Two sets of Christian stances towards proceeding with embryonic stem cell investigations are contrasted in order to highlight their respective theological, moral and scientific emphases. It is concluded that both represent valid Christian responses, even though they envisage different roles for blastocysts within the human community.

Embryonic stem cells – the vigorous debate

The world of biomedicine has been turned upside down over the past few years with the realisation that stem cells, which had been regarded as a purely developmental phenomenon, can be stimulated into action long after the developmental period is over.¹ It has been known for many years that stem cells are unspecialised cells, which have the ability to renew themselves indefinitely, and under appropriate conditions can give rise to a wide range of mature cell types in the human body. However, the traditional view had been that, in many (but not all) tissues, stem cells are switched off once development has been completed. If this is not the case, they may have far-reaching potential, since any disorder involving loss of, or injury to, normal cells could be a candidate for

1 Chief Medical Officer's Expert Group *Stem Cell Research: Medical Progress with Responsibility*, UK: Department of Health (2000) pp. 5-48; Department of Health. Government Response to the House of Lords Select Committee Report on Stem Cell Research. UK Government (2002) pp. 1-18; National Institutes of Health *Stem cells: scientific progress and future research directions*, Department of Health and Human Services. June 2001. <http://www.nih.gov/news/stemcell/scireport.htm>.

stem cell replacement therapy.²

Stem cells can be derived from a variety of sources, including early embryos, fetal tissue and some adult tissues (bone marrow and blood being the best known examples). In other words, they can be obtained from a range of ordinary tissues in adults, as well as from embryos, giving rise to two major categories of stem cells: *adult stem cells* and *embryonic stem (ES) cells*. In humans this appears to present a choice of stem cell sources: ethically neutral adult tissue and ethically contentious embryos. For many this is not a choice at all, since theological and ethical considerations drive them towards adult tissue and away from embryonic tissue: the use of ES cells is repugnant, whereas the use of adult stem cells retains the potential to benefit patients with severe diseases.³

There would be no problem if the scientific merits of the two groups of sources were equivalent. The decision as to which one to use could then be based on other premises, including theological and ethical ones. However, this research field is in its infancy, and many facets of stem cell technology remain to be clarified. In other words, the science remains far from definitive, and one cannot state with any assurance that adult stem cells are as effective as ES cells.⁴ Resolution will only emerge with further research, that will inevitably involve as wide a range of stem cells as possible, and the outcome could well be that different stem cells will be effective in different situations. In spite of this, the political pressure in some countries to demonstrate that the potential of adult stem cells is as great as, or even greater than, that of ES cells is intense. On some occasions, the result is a confusing mix of scientific, ethical and theological considerations. While it is legitimate to argue against employing ES cells on theological and ethical grounds, it should be accepted that, in the current state of knowledge, ES cells may still prove useful scientifically and clinically.⁵

For many Christians all embryonic life from conception onwards is to be protected and valued.⁶ In no circumstances should any embryonic life be disposed

2 Committee on the Biological and Biomedical Applications of *Stem Cell Research. Stem cells and the future of regenerative medicine*. Washington DC: National Academy Press (2002).

3 The Center for Bioethics and Human Dignity 'On human embryos and medical research: An appeal for ethically responsible science and public policy', *Ethics and Medicine* (1999) 15, 85-89; The Center for Bioethics and Human Dignity. Press release 11 August, 2001. <http://www.cbhd.org/>; The Do No Harm Coalition. <http://www.stemcellresearch.org>. (2004).

4 Towns, C.R. & Jones, D.G. 'Stem cells, embryos and the environment: a context for both science and ethics', *Journal of Medical Ethics* (2004) 30, 410-413.

5 Chief Medical Officer's Expert Group, *op. cit.* (1); Department of Health, *op. cit.* (1); Winston, R. 'Embryonic stem cell research. The case for', *Nature Medicine* (2001) 7, 396-397.

6 Of the very many references that could be used at this point, some of the most detailed arguments have been put forward by Edwin C. Hui in his book *At the Beginning of Life: Dilemmas in Theological Bioethics*, Downers Grove, Illinois: InterVarsity Press (2002). This book represents his interpretation of scientific, philosophical, theological and ethical data and ideas. It is also relevant to note that conception is an ambiguous notion, and has historically been used in different ways. However, in contemporary theological discussions it generally refers to fertilisation, that is itself a process rather than an instantaneous event.

of, or used for research or therapeutic purposes. Its inviolability is a prerequisite for a Christian moral stance. Inevitably, therefore, the derivation of ES cells from human embryos lies outside the compass of acceptable Christian practice. In this view, a line in the sand has been drawn beyond which Christians (and ideally society) should not tread; hence, the vigour and theological tenor of so much of the debate on the use of ES cells. This is one of those places where, it is claimed, the line is being crossed with potentially catastrophic repercussions, since it is part of a much larger enterprise aimed at re-engineering humanity.⁷

Early embryonic development

The human embryo in the laboratory

It is only over the past 30-40 years that the viable human embryo has been available for study in a laboratory setting.⁸ Prior to that, knowledge of the human embryo was confined to microscopic observations of whole and sectioned embryos obtained following abortions (induced as well as spontaneous), and from what could be inferred from studies of non-human embryos such as the mouse. While this information laid the basis for the discipline of embryology, it inevitably had a static quality about it or it was information derived from similar but not identical embryos. The living human embryo was largely unknown territory, being confined to pregnant women and far from amenable for scientific study. Consequently, availability of these early stage pre-implantation human embryos for scientific study in the laboratory has proved revolutionary.

Availability of embryos per se does not prejudice the nature of any investigations that might be undertaken, although these will in all probability encompass destructive research, since it is difficult to conceive of any way in which initial research could be therapeutic for the embryos being studied. What this highlights is that the question of destructive research on human embryos predates issues surrounding ES cells, and is not confined to them.

7 In many of the examples of this, one finds that the boundary between fearful futuristic visions, and ethical and theological analysis has largely disappeared. The result is that realistic scientific possibilities are judged along with highly speculative vistas, and are tarred with the same brush. Jones N.L. & Kilner J.F. 'Genetics, biotechnology and the future', The Center for Bioethics and Human Dignity, 2004 April 8 http://cbhd.org/resources/genetics/jones_kilner_2004-04-08.htm

8 The term 'embryo' refers to the first eight weeks of human development, although the focus of this paper is on the first two weeks of development (pre-implantation embryo) with particular emphasis on the first one week of development. I am using the term 'viable' in the sense that fertility specialists consider viable embryos have a good chance of giving rise to an ongoing pregnancy when transferred to a woman undergoing IVF treatment. Using currently available techniques, they appear to be healthy and growing. Embryos considered non-viable would not be transferred.

Biological characteristics of early embryonic development

The fertilised egg is a single cell, the zygote, and is totipotent, giving rise eventually to the fetus and placenta. This single cell divides to produce two, then four, then eight smaller, identical cells. These are the blastomeres, which at the eight-cell stage are only loosely associated with one another, and have the potential to develop into complete adults if separated from the remaining blastomeres.⁹

As the number of cells continues to increase, this equal developmental potential is lost. By between five and seven days, the mass of cells has an internal cavity, and is termed the *blastocyst*. The outer cells form a surface layer, the trophoblast, which becomes the trophoblast when implantation occurs into the wall of the mother's uterus (completed by fourteen days). These trophoblastic cells eventually give rise to the placenta. By contrast, the inner cells constituting the inner cell mass (ICM) are still undifferentiated, and it is from a small number of these cells that the future individual arises.

By fifteen to sixteen days the *primitive streak* is visible. This is a transitory developmental structure that instigates the appearance of the neural plate and from which arises the first rudiment of the nervous system early in the third week of gestation.

The primitive streak has assumed a position of major importance in ethical debate. Its appearance is widely regarded as marking a point of transition, with some arguing that no coherent entity exists prior to it,¹⁰ and hence nothing that can be meaningfully referred to as a human individual.¹¹ On the other hand, from this point onwards a spatially defined entity capable of developing into a fetus and infant begins to exist. While these points are made within a scientific framework, they send out powerful ethical and regulatory messages. Consequently, in those societies where research on human embryos is permitted the dominance of the fourteen day upper limit to research is currently unchallenged, except by organisations that oppose any research on the human embryo.

Blastocysts and embryonic stem cells

Regardless of the scientific and ethical merits of the fourteen day limit, its jus-

9 One or two blastomeres (cells) are removed from embryos at 3-4 days during the procedure of pre-implantation genetic diagnosis (PGD). Embryos at the 8-cell stage can develop into normal individuals even after the removal of two blastomeres.

10 The major scientist whose name is associated with the origin of these ideas in this context is Ann McLaren. See: 'Prelude to embryogenesis', In CIBA Foundation, *Human Embryo Research: Yes or No*, London: Tavistock Publications (1986), pp. 5-23; and 'Can we diagnose genetic disease in pre-embryos?', *New Scientist* (1987) 116, 42-47.

11 Shannon, T.A. & Walter, J.J. *The New Genetic Medicine*, Lanham, Maryland: Rowman and Littlefield (2003).

tification is becoming less convincing for the simple reason that research on stem cells highlights the fact that predecessors of the future individual are present well before fourteen days. For instance, human ES cells can be isolated and cultured from the ICM of blastocysts at five to seven days, demonstrating that individual cells from the ICM are capable of forming any cell type in the body.¹² It is these cells' *pluripotent* nature that holds out such great hopes therapeutically.

The intact blastocyst within a woman's body is *totipotent*, in that it has all the resources necessary (ICM cells and trophoctoderm) to produce all three germ layers and can therefore form a complete new individual. It also exists within a uterine environment that allows this to take place. Once one or more of these conditions is removed, the blastocyst ceases to be totipotent. This is the situation of *in vitro* blastocysts (those in the laboratory), since they have been removed from a uterine environment. As long as this continues to be the case, they are 'potentially totipotent'.¹³ Their status reverts to that of 'actually totipotent' as soon as they are introduced into a woman's uterus for further development.¹⁴ In practice, blastocysts used in research will remain potentially totipotent, unlike those used for reproductive purposes in IVF programs, that will become actually totipotent (regardless of the clinical outcome).

This contrast can be rephrased by referring to 'blastocysts within an environment congenial to further development' as against 'blastocysts within an environment hostile to further development'.¹⁵ The first situation has the potential of producing a human individual; the second has no such potential, especially since research beyond fourteen days is currently forbidden. When discussing the moral status of blastocysts, perhaps a distinction should be made between 'blastocysts plus environment' and blastocysts as discrete autonomous entities.

In light of this, it follows that individual ICM cells, including ES cells, are pluripotent rather than totipotent, as long as they are isolated from trophoctoderm cells, and are in a laboratory environment. While this could change in the future with scientific advances, it will remain the situation for the foreseeable future.

However, in treating blastocysts in one way rather than another we have to confront the issue of our intentions. What are we aiming to achieve, and why? The mere act of maintaining blastocysts in an artificial laboratory environ-

12 Thomson, J.A., Itskovitz-Eldor, J., Shapiro, S.S., Waknitz, M.A., Swiergiel, J.J., Marshall, V.S. & Jones, J.M. 'Embryonic stem cell lines derived from human blastocysts', *Science* (1998) 282, 1145-1147.

13 Towns & Jones *op. cit.* (4).

14 This argument will apply even if it becomes possible to continue development in an artificial womb (ectogenesis). The latter will provide an environment suitable for the continuation of gestation.

15 Jones, D.G. 'The human embryo: Its ambiguous nature', *Proceedings of the Royal Society of Edinburgh* (2004) in press.

ment points to our desire to do something to them and with them. This may be to enhance the prospect of generating new human life. Alternatively, the intention may be to conduct research on them with the goal of increasing understanding about early human development or of using them for therapeutic purposes. The further step of isolating stem cells raises similar considerations. Within the broad compass of the interests of the human community, such intentions can be life-enhancing. The opposite perspective, condemnation of any study of blastocysts within a laboratory environment, sees the isolation of blastocysts as life-denying. The intention in this instance is protection of blastocysts, with no acceptance that study of them can legitimately contribute to the enhancement of human existence. It is interesting that, on both sides, the intentions may have a great deal in common.

Somatic cell nuclear transfer and nuclear-transplant blastocysts

Somatic cell nuclear transfer (SCNT – cloning) demonstrates that the full genetic complement of an adult cell can be reactivated well into the chronological life of the cell.¹⁶ Central to this is the ability of differentiated cells to be reprogrammed to produce all the other cell types necessary for the development of a complete organism. In this way, skin cells or simple cells like fibroblasts could be reprogrammed to give rise to blastocysts and ES cells, without any hint of fertilisation. Such blastocysts might be termed *nuclear-transplant blastocysts*, as opposed to fertilised blastocysts. While these could, in principle, serve as the source of a new individual by being transferred to a woman's uterus, scientific and clinical interest lies in using them as a source of cell and tissue lines.

We have already seen that, as long as these blastocysts are maintained in the laboratory, they are not totipotent. A much stronger claim has even been made, namely, that nuclear-transplant blastocysts are inherently incapable of giving rise to human individuals, because it is proving exceedingly difficult to go beyond the blastocyst to the stem cell line stage, let alone beyond.¹⁷ Whether or not this is correct (and it may well have to be revisited in due course), the base line is that there has been no fertilisation, and there will be no future individual. Consequently, these blastocysts may be referred to as *artificially produced blastocysts* growing in an *artificial environment*, brought into existence specifically for research purposes, and ultimately to replace damaged tissues and organs in existing human beings. This is human tissue, the potential of which is limited to the production of specified tissues.

Nuclear-transplant blastocysts represent the extreme end of a continuum. The artificial element in their production is more pronounced than that found

16 Wilmut, I., Schneike, A.E., McWhir, J., Kind, A.J. & Campbell, K.H. 'Viable offspring derived from fetal and adult mammalian cells', *Nature* (1997) 385, 810-813.

17 Butler, R. 'Human cloning', *Chemistry and Industry* (2004) 5, 12-13.

in the production of IVF embryos, where fertilisation has occurred, albeit artificially. Both groups are maintained in an artificial laboratory environment that precludes further development. Together, they stand in contrast to naturally fertilised blastocysts that represent the opposite end of the artificial-natural continuum, and that exist in a uterine environment generally, if not always, favourable to further development.

A range of theological perspectives

Against this scientific background I shall analyse three theological perspectives. I have chosen these three because all are well informed by scientific as well as theological data, and all attempt to take seriously a diverse range of inputs. While these three perspectives do not exhaust the range of perspectives available, they helpfully represent a broad cross section of opinion.

Ethic of personhood based on relationality

The first position is that of Edwin Hui, Professor of Biomedical Ethics and Christianity and Chinese Culture at Regents College, Canada. His 2002 book *At the Beginning of Life: Dilemmas in Theological Ethics* contains an extended treatment of his position.¹⁸

Hui is very well informed on the science of early development, including the interplay between the developing organism and its environment. However, his stress is on the organism's intrinsic goal-directedness, allowing him to conclude that the embryo is a complete autonomous human individual.¹⁹ In light of this he argues:

Based on the human zygote's genetic uniqueness, its ontological identity and continuity and its innate capacity for self-development, I see not a potential human person but a human person with a potential to develop.²⁰

Theologically, he comes to a number of major conclusions. The first is that the human soul is present at conception.²¹ Potentialities and capacities are given from the moment of God's creative act, based as these are on God-creature relationships, established intentionally and unilaterally by God.²² Secondly, human personhood is constituted by a covenant of love initiated by God and expressed in the creation of the human organism through the marriage covenant.²³ Thirdly, the image of God expresses a unique relationship that is initiated, established and sustained by God, pointing to his faithfulness in

18 Hui *op. cit.* (6).

19 *ibid.*, pp. 65-66.

20 *ibid.*, p. 74.

21 *ibid.*, p. 100.

22 *ibid.*, p. 160.

23 *ibid.*, p. 130.

keeping a unilateral covenant of love and grace.²⁴ Hence, one is a person irrespective of one's inability to respond to God on account of one's iniquity, developmental immaturity or disability.

A major outworking of this framework is Hui's opposition to any technological inroads into the reproductive process, including the whole gamut of the artificial reproductive technologies (ARTs), artificial contraceptives, embryo manipulation and surrogacy.²⁵ In his view use of the ARTs forces God to accept the child when he has not given that gift of life.²⁶ Scientific technological reproduction has replaced divine-initiated procreation,²⁷ and will lead to alterations in the fundamental essence of human nature. Not unexpectedly, he vigorously opposes use of ES cells, since from his perspective this reflects a total disregard for the value of embryonic lives.²⁸ He sees no place for any study of human embryos or ES cells, since any scientific potential is trumped by his theological stance.

Hui describes his ethical position as one of personhood based on relationality, according to which changes and improvements are only acceptable where what has been created frustrates the Creator's intention for relationship. Any procedures that undermine our dependence upon God and our interdependence on fellow human beings are unacceptable.²⁹

Hui's dual emphases on relationality and on a foundation based on God's purposes are welcome. However, they also lead to a number of problematic consequences. First, the inadmissibility of any technological interference in reproduction leads to the conclusion that God only works through natural processes. However, similar reasoning in other branches of medicine would lead to the conclusion that life-saving operations and the use of antibiotics or anti-depressants thwart the purposes of God. One has to ask why they appear to do this in the reproductive area but not in others; presumably because the origin of ontogenetic life is seen as being of a different character from the others. Secondly, it is difficult to understand why the birth of a longed-for child following artificial intervention and within a loving context is not a gift of God, while an unwanted child born naturally and not in a loving context is a gift of God. Thirdly, while Hui provides categorical answers to what is not allowed in the reproductive sphere, there is a lack of clarity regarding the criteria he is employing to determine which procedures frustrate the creator's intention for relationship. One can argue that infertility does this, just as much as the removal of a life-threatening tumour. Similarly, how does one determine what undermines our dependence upon God? A technological ethos dominating soci-

²⁴ *ibid.*, pp. 145-148.

²⁵ *ibid.*, p. 236.

²⁶ *ibid.*, p. 187.

²⁷ *ibid.*, p. 199.

²⁸ *ibid.*, p. 254.

²⁹ *ibid.*, p. 266.

ety may well do so, although the extent to which individuals seek technological solutions to human problems may be of far greater significance. Fourthly, Hui's analysis appears to limit the role of human intervention in reproduction, confining it to natural intercourse. Nowhere is scientific creativity allowed a supplementary role, even to enhance the natural process, rendering the human-divine relationship far more asymmetrical in this area than in many others.

It is not clear how the theological principles enunciated by Hui are to be applied in pluralist societies. A set of ethical ideals is mapped out based on a set of theological principles. Those who espouse these ideals and their social repercussions will encounter a major gap between them and most other positions within society. This is not a criticism of the ideals per se, but assistance is required to determine how Christians holding these ideals are to function in an alien environment. Hui does not provide a way forward.

The common nature of early embryos

The second position is that represented by two Roman Catholic bioethicists, Thomas A. Shannon and James J. Walter in their 2003 book, *The New Genetic Medicine*.³⁰ This book consists of a series of essays that have appeared over the past few years by these two leading American Roman Catholic bioethicists (including one in association with Allan B. Wolter), and provides a fascinating and exceedingly important glimpse into aspects of the Roman Catholic moral tradition. The writings are exemplary for their willingness to wrestle with new scientific findings and directions, and with the possible implications of these for traditional formulae, including magisterial teachings of the Roman Catholic Church. While the authors are deeply imbued with these teachings, they demonstrate a willingness to question them, and overturn them when necessary.

Using various avenues the authors arrive at the conclusion that an individual is not present until about two to three weeks after the beginning of fertilisation. Interestingly, they call on the writings of the medieval philosopher, Duns Scotus, to argue that one cannot claim the moral relevance of individuality until after the process of restriction (the reduction of the developmental options permitted to a cell) has occurred. Prior to that it is more appropriate to refer to the embryo's 'common nature', when its genetic status is associated with what is common to all, not what is unique to a particular individual. Hence,

[while] the preimplantation embryo contains the appropriate genetic information for the organism's development, that genetic information is not necessarily associated with a specific individual and cannot, therefore, claim moral privilege through such an association. The genetic uniqueness is

30 Shannon & Walter *op. cit.* (11).

associated with what is common to all – human nature – not a particular individual because such an entity does not yet exist.³¹

In part, this argument depends on what the authors claim is the totipotency of the cells of the pre-implantation embryo, so that it is only when this capacity is lost through the process of restriction that an ontological individual emerges.

In view of these arguments, they are resolute in stating that the early embryo cannot claim absolute protection based on claims to personhood grounded in ontological individuality; it is not an individual person from fertilisation.³² More specifically:

There is a time period of about three weeks during which it is biologically unrealistic to speak of a physical individual. This means that the reality of a person, however one might define that term, is not present at least until individualization has occurred. Individuality is an absolute, or necessary, condition for personhood.³³

However, they are equally clear in asserting that the early embryo is valuable. This is based on the fact that it is living, has the human genetic code and possesses genetic uniqueness. Its value does not depend on the presence of characteristics like intelligence or a capacity for relationships.³⁴

Taken together these arguments lead them to claim that the pre-implantation embryo has what they describe as a *premoral value*. This premoral value must be judged in the light of other premoral and moral goods, such as the benefits that may accrue from research on these embryos in reproductive and other areas.³⁵ Consequently, it is the pre-implantation embryo's lack of individuality that is a key element in justifying the lack of its absolute protection and also the possibility of conducting research on it.³⁶

In the light of these underlying concepts, the authors are prepared to allow research on human embryos, including embryonic stem cell research and therapy, and therapeutic cloning. Care is taken to specify limits and constraints in all cases, especially in terms of their underlying theological vistas, and their attempt to attain coherence between moral theology and modern embryology.

Shannon and Walter's contribution is characterised by a determined effort to reinterpret traditional theological viewpoints in the light of contemporary scientific understanding. This is not a departure from the tradition itself, which was based in part on what would now be considered to be outdated scientific

31 *ibid.*, p. 128.

32 *ibid.*, p. 54.

33 *ibid.*, p. 57.

34 *ibid.*, p. 57.

35 *ibid.*, p. 130.

36 *ibid.*, p. 131.

concepts. Hence, their approach does not represent a weakening of the religious tradition within which they work, but a reaffirmation of it in contemporary terms. The result in practice will come as a shock to many, both within and outside this tradition, and it stands in stark contrast to Hui's conclusions. The differences come down to: a) the extent to which a theological position, such as the commencement of human life at conception, is regarded as being dependent upon scientific understanding; b) the degree to which a role for science in arriving at this position is or is not explicitly recognised; c) a willingness to recognise that, if a theological position is dependent in part on scientific input, it has to be open to some modification. Additionally, there are even differences of interpretation of the science itself, and one has to ask to what extent these are driven by prior theological and moral commitments.

Shannon and Walter's emphasis on the early embryo's common nature and hence pre-moral value is of particular significance, as is the balancing perspective provided by the reasons why the early embryo is to be accorded value. In spite of my considerable sympathy with the main thrust of this position, it can be faulted on a number of grounds. For instance, its emphasis on the totipotency of the pre-implantation embryo is too nebulous, suggesting that a far greater range of cells is totipotent than appears to be the case. The phenomenon of restriction probably occurs earlier than these authors suggest; this, in turn, may dent their assurance regarding the pre-individual status of the embryo throughout its first two to three weeks of development. There are also elements of circularity in their argument, with the absence of an ontological individual forming the basis for the concept of the commonality of embryos' genetic make-up.

Embryonic dignity – conferred and claimed

The third position is that of Ted Peters, a Presbyterian theologian at the Center for Theology and the Natural Sciences in Berkeley, California. I shall refer to views expressed in his 2003 book: *Playing God? Genetic Determinism and Human Freedom*,³⁷ and also in a review article in the journal, *Theology and Science*.³⁸

Peters is curious as to why so many theologians, when confronted by the value of the human embryo, are drawn to the past, since this confines the debate to what he considers is a confused account of genetic origin. He contends that this is not required by Christian theology, since it leaves out of account God's eschatological call to become who we are destined to be.³⁹ This is

37 Peters, T. *Playing God? Genetic Determinism and Human Freedom*, New York: Routledge (2003).

38 Peters, T. 'Embryonic persons in the cloning and stem cell debates', *Theology and Science* (2003) 1, 51-77.

39 *ibid.*, p. 66.

closely allied with gifts given us by God, namely, our creativity as human beings, the glimpse we have been given of God's promised future, and our ability to make decisions for the good.⁴⁰ This is foundational for the major themes he outlines.

The first of these is *dignity*, which he sees as being initially conferred and subsequently claimed. He writes:

[Our] human dignity is ultimately conferred by God. Furthermore, because we have experienced God treating us with dignity, we now confer it on one another. When we confer dignity on someone we love, we treat that person as having intrinsic value. This is the nature of Christian love, namely, to treat the beloved as an end and not as a means to some further end.⁴¹

Dignity in these terms is *relational* in character, in that it is the fruit of an ongoing loving relationship, expressed so clearly in the developing relationship between a mother and her newborn.⁴² This is where Peters's future orientation enters the picture, since he regards dignity as being derived more from destiny than from origin.⁴³ The conferring of dignity on someone who does not yet experience or claim it is a gesture of hope. It is the future end-product of God's saving activity rather than something imparted with the genetic code.⁴⁴ This has ethical implications, since we are to impute dignity to those who may not already experience it, enabling them to claim it for themselves.⁴⁵

A second characteristic of Peters's position is that, since the spotlight is no longer directed exclusively onto the early embryo, the principle of *beneficence* can be included in ethical calculations. This allows him to examine which other groups might benefit from a greater understanding of the embryo, emanating possibly from research on the embryo. Without this shift in the spotlight, non-maleficence towards the embryo forcefully trumps beneficence towards others within the human community.⁴⁶ Only in this way can beneficence be rescued from the shadowy position it occupies in much theological thinking about reproductive issues. This is important for Peters since, with his future-directed gaze, he envisions a time when genetic medicine may promise a significant measure of potential for relieving crying and pain.⁴⁷

The promise contained within this future vision can only be brought about by *creativity*, something that Peters sees as fundamental to human existence. He writes that we are condemned to be creative; we cannot avoid it. And so, the

40 Peters *op. cit.*, (37), pp. 213-214.

41 Peters *op. cit.*, (38), p. 68.

42 *ibid.*, p. 69.

43 *ibid.*, p. 71.

44 *ibid.*, p. 72.

45 Peters *op. cit.*, (37), pp. 168-169.

46 Peters *op. cit.*, (38), p. 58.

47 Peters *op. cit.*, (37), p. 214.

purposes toward which our creativity is directed, are implicit to our ethical mandate.⁴⁸ Since these include scientific advance in the reproductive sphere, we will inevitably come face-to-face with a range of choices in this sphere. Peters responds by stating that it is incumbent upon us that we construct ethical visions that take expanded choice of this nature into consideration.⁴⁹ Such choices inevitably involve questions raised by genetic make-up, but rather than seeing these exclusively in technological terms, he reminds us that any answer must incorporate the theological perspective that God loves each of us regardless of genetic make-up. Therefore, we are to do likewise.

One of the most provocative aspects of Peters's thesis is his discussion of the possibility that virtually any *somatic cell* within our bodies may be a potential human being.⁵⁰ He is interested in asking how this might affect our view of the dignity of embryos, since it opens up the prospect that each cell in our bodies may acquire the status of a potential embryo. He wants to avoid ethical arbitrariness in giving a special status to some totipotent cells but not others. This has direct relevance to stem cells, since if a fetus could be produced from a stem cell, it appears that all ethical concerns previously applying to the use of embryos in research would now apply to ES cells.⁵¹ While this is pushing beyond the bounds of current science, it serves to focus attention on whether the dignity currently ascribed to embryos may have to be ascribed to any totipotent cell, and if so why. Peters concludes:

The genetic potential for making persons is virtually ubiquitous. Yet, we have no ethical warrant to actualize all this potential. No warrant exists to make babies out of every available germ cell let alone every already differentiated somatic cell, nor do I think it is required of every pluripotential stem cell.⁵²

Peters does not consider that individual human dignity is violated at the source of stem cells, leading him to conclude that the benefit of the doubt should be given to beneficence. Ethical encouragement should be given to proceed with this type of research.

What we have in Peters's position is a melding of divine action in conferring dignity, and human response in claiming dignity and ensuring that individuals are provided with an opportunity to blossom and flourish. In no way is dignity regarded as an automatic outworking of genetic characteristics. This follows from the future-directedness of his position, together with the acknowledgment of human creativity and therefore of the centrality of human action. How-

48 *ibid.*, p.16.

49 *ibid.*, p. 172.

50 Peters *op cit.*, (38), p. 67.

51 Peters *op. cit.*, (37), pp. 183-184.

52 *ibid.*, pp. 186-187.

ever, all this is viewed within a strong theological framework arising out of God's love for all. This, in turn, leads to God's bestowal of unmerited dignity on all, the outworking of this in community and in the development of human relationships, and an overarching eschatological hope based on God's promises of a coming kingdom of justice and fulfilment.

But does this approach lead to the bestowal of differential value on human beings, in that some are valued more highly than others because some are provided with greater opportunities to flourish? Likewise, are embryos differentially valued, and are they as a group valued less highly than children and adults? The answers appear to be that there will be differential value, but it can also be argued that this is what happens in practice, no matter how much the absolute value of all humans from conception onwards is touted. In some cases, as with embryos, equality is unachievable even as a theoretical ideal. The Christian commitment, according to Peters, should be to achieve as much equality as is feasible for individuals, and to provide conditions that will enable the human community as a whole to flourish.

While these principles may seem far removed from the day-to-day decisions on embryo research and stem cells, this is not so. They allow Peters considerable liberty in allowing embryo manipulations, not as ends in themselves, but guided by the beneficence argument. The good of others in the community may on occasion trump the good of embryos. Where one would like additional guidance is on the criteria that guide decisions of this order. But this is not where Peters is concentrating his energies. To attain such guidance one has to look to Shannon and Walter. They, together with Peters, provide a coherent theological approach to the embryo, informed by scientific evidence.

Ambivalence over the prenatal person

Before leaving these theological contributions, I shall refer to an additional one that does not fit readily into any of the above three categories. This comes from the pen of Norman Ford, a Roman Catholic theologian at the Melbourne College of Divinity. In his 1988 book *When Did I Begin?* he sought to bring together theological, philosophical and scientific considerations of the status of the human embryo. More recently, in *The Prenatal Person*, he has built upon this foundation in his assessment of a number of clinical and research issues in the reproductive realm.

Like the authors previously discussed, Ford takes seriously scientific data and concepts and is very well informed on the state of the science, as comes to the fore in *When Did I Begin?* It is on this basis that he concludes that the human individual begins at the primitive streak stage and not before. He argues:

This is so because the conditions for the presence of an actual human individual, in the sense of an on-going living ontological individual with a true

human nature, are not satisfied prior to the formation of the primitive streak.⁵³

From this, he concludes that:

Instead of viewing development in the first two weeks after fertilization as development of the human individual... the process ought to be seen as one of the development into a human individual.⁵⁴

Up to this point the position arrived at by Ford has similarities to that of authors such as Shannon and Walter. Nevertheless, Ford makes clear that he has no wish to declare that his claim is definitely right, the significance of which emerges when confronted by the necessity of applying this stance to research and clinical considerations. For Ford prudence requires that any reasonable doubt should be ethically resolved in favour of treating the zygote as a person, even though he is not convinced by the argument that the zygote is an ongoing human individual.⁵⁵

It is in this context that his view of human embryos as potential persons has to be viewed. And it is this that leads him to the position that we have a duty of absolute respect for embryos from the beginning of the zygote. He regards this as inherent to the Creator's plan for zygotes to become human individuals.⁵⁶ The consequences of this view are far-reaching, leading as it does to rejection of procedures such as the freezing of human embryos, any research or therapy involving the destruction of human embryos, cloning, the extraction of embryonic stem cells, and pre-implantation genetic diagnosis.⁵⁷

It appears that what one has in Ford's position is a dissonance between his assessment of the scientific evidence and his theological position. Even though he recognises that it is impossible to ascribe individuality to a developing embryo earlier than fourteen days (and possibly later), the developmental impetus present before this stage provides an ethical imperative to protect the early embryo (what he terms the pro-embryo) and treat it as though it were inviolable. While he is rightly concerned about the reductionism that sees embryonic human life as nothing more than impersonal products lacking any value or significance, the potentiality argument by itself fails to address this in a convincing manner. In ignoring his own detailed analysis of the science, he undermines his ethical stance.

Searching for a biblical contribution

Underlying every facet of this debate is a searching question for Christians,

53 Ford, N.M. *When Did I Begin?* Cambridge: Cambridge University Press (1988), p. 173.

54 *ibid.*, p. 181.

55 Ford, N.M. *The Prenatal Person*, Oxford: Blackwell Publishing (2002), p. 64.

56 *ibid.*, p. 68.

57 *ibid.*, pp. 70-74.

and this is what part biblical perspectives have to play in coming to a view of the meaning and value of the blastocyst and ES cells. A number of categories present themselves.

- 1 The Bible alone provides a complete guide to ways in which blastocysts should be treated, making scientific input irrelevant.
- 2 The Bible is one of a number of sources of concepts and information, but is the major determinant whenever there is conflict or confusion.
- 3 The Bible is one of a number of sources of concepts and information, and helps to inform decision-making, but may not be the major source.
- 4 The Bible is irrelevant and hence can provide nothing of any interest to scientists or ethicists.

These categories are not meant to be definitive, and I acknowledge that some writers will not fit easily into any particular one.

It is difficult to see how *category 1* can be upheld where the subject matter was unknown to the biblical writers. Blastocysts and ES cells are products of contemporary analysis and characterise contemporary thinking. Any direct reference to them in Scripture is impossible. In spite of this obvious assertion, many will argue that, if the Bible teaches that the human embryo is inviolable from conception, blastocysts by definition will also be inviolable. Hence, complete protection for blastocysts is mandatory; and ES cells should be placed beyond the reach of scientists and clinicians. But does each of these positions emerge from Scripture alone?

The stance that the human embryo is inviolable from conception onwards relies heavily upon the personal experiences of a limited number of people in the Bible (mainly David, the king, and Jeremiah, the prophet). The biblical data refer to God's servants as they look back at his protection of them throughout their own embryonic and fetal lives (Job 10: 8-12; Psalm 22: 9,10; 51: 5; 139: 13-16; Isaiah 49: 1; Jeremiah 1: 5). In so far as God was caring for them in adult life, he had also cared for them during their early developmental stages as embryos. The persons they were in adult life and what they had been in embryonic life are the same. These retrospective data are theologically important, but do they provide any guidance on how we today should view embryos in general, or even more specifically blastocysts in the laboratory? Some writers argue that they do provide such guidance since they demonstrate that God is concerned for all embryos, all are potential children of God and all enjoy a personal relationship with him.⁵⁸

⁵⁸ Bentley, G.B. 'A moral-theological approach', In Channer, J.H. (ed.) *Abortion and the Sanctity of Human Life*, Exeter: Paternoster Press (1985), p. 61. See also Wenham, G. & Winter, R. *Abortion: The Biblical and Moral Challenge*, London: CARE Trust (1983); Stott, J. *New Issues Facing Christians Today*, Basingstoke: Marshall Pickering (1999), pp. 346-381.

This interpretation illustrates the move from specific instances taking place within a well-defined theological context to the far more general position that these same instances provide infallible clues to the inviolability of the whole population of embryos.⁵⁹ In other words, *retrospective* statements are being interpreted *prospectively*. This transformation removes them from category 1 into category 2. The biblical evidence may point towards the desirability of protecting embryos whenever possible, but the further move to inviolability is a leap beyond this. The personal history of God's servants is, principally, the personal history of God's servants. To make this into a general principle relating to the status of all embryos regardless of their relationship to a community of faith⁶⁰ requires reference to extra-biblical concepts.

In other words, most stances that are put forward as being entirely based on the Bible (category 1 in my terminology) are actually *category 2* positions. Take another example, that of Mary when she was first aware of Jesus prior to his birth (Luke 1: 41-44). Some consider that, in view of this, Jesus's embryonic life (although, more accurately, this is Jesus's fetal life) confers a special significance on all other human beings, and also that all human embryos carry the rights and dignities that membership of the human species entails.⁶¹ The latter is not implicit in the biblical evidence.

In similar vein the time spent by Jesus as an embryo (once again, this should be Jesus as a fetus although this distracts from the argument) has been used to argue for the Word becoming flesh down to the level of our genes. Since genes were unknown to the biblical writers, this is a theological statement reinterpreted in modern biological language. It has also been claimed that Jesus, in his role as mediator, has taken our human flesh into relationship with God in a decisively new way from conception onwards.⁶² This is used to argue that human existence (personhood; the image of God) commences at conception and is inviolable, a statement that moves conceptually way beyond the biblical testimony.

It is clear that those who claim to argue exclusively on biblical grounds (category 1) fail to do so, since other data and concepts are being introduced into these positions (so that they fit into category 2). The same applies to all arguments that are allegedly based on Scripture, but use genetic uniqueness, a scientific notion, to bolster claims that human life (personhood) commences at conception. The belief that every human embryo ever conceived is to be protected is a possible, but not an inevitable, extension of biblical principles.⁶³

59 Foster, J. 'Personhood and the ethics of abortion,' in Channer *op. cit.*, (58), pp. 31-53.

60 Jones, D.G. *Manufacturing Humans*, Leicester: Inter Varsity Press (1987), p. 128.

61 Cameron, N.M.de S. 'The Christian stake in the Warnock debate', In Cameron, N.M.de S. (ed.) *Embryos and Ethics*, Edinburgh: Rutherford House Books (1987), p. 13.

62 Atkinson, D. 'Some theological perspectives on the human embryo', In Cameron *op. cit.*, (61), p. 54.

63 Jones, D.G. 'The human embryo: a reassessment of theological approaches in the light of scientific developments', *Stimulus* (2000) 8, 38-45.

Bryant and Searle⁶⁴ have issued a similar warning, as they caution against the use of what they describe as reverse transposition. This is the application of scientific knowledge to the Bible, to make it refer to a concept like fertilisation that was unknown to them. From this they argue that when the biblical writers referred to a woman conceiving a child, what they had in mind was her awareness of being pregnant.

An excellent example of a category 2 writer is Hui,⁶⁵ whose position I examined above. As we saw there, he analyses in a very helpful manner a broad range of approaches to the embryo and allied reproductive technologies, and yet ultimately his approach appears to owe more to theological imperatives. His assurance regarding conception as God's creative act within a covenant of love and grace emanates from his theological commitment that is then applied to every embryo ever conceived. Consonant with this, he allows a diminished role for science and scientific procedures. However, he recognises that biblical texts, viewed in isolation of other input, fail to provide a way forward when specific decision making is required in contemporary debate.

The contributions of Shannon and Walter⁶⁶ and Peters⁶⁷ fall into *category 3*. They start from well-formulated theological traditions, which they aim to utilise to inform current debates surrounding the blastocyst and ES cells. However, they accept that these traditions may require modification in the light of the latest scientific developments. In allowing this they are assuming that the traditions themselves incorporate scientific concepts, albeit ones dating from past centuries. While it is true that these writers have not set out to analyse the biblical writings, they take close note of what they regard as theological principles that emerge from biblical testimony and church tradition. They are prepared to examine possible repercussions of scientific explorations, such as the influence of the environment (including the laboratory environment) on the value to be ascribed to blastocysts, and incorporate this into their perspectives. Their horizons also incorporate considerations of the welfare of the human community as a whole, and where blastocysts may fit in to this.

A danger inherent within category 3 positions is that scientific data may be misinterpreted and scientific concepts over-extended, either of which will vitiate the scientific contribution and may distort the theological stance. This parallels the problems encountered in the category 1 and 2 positions with their undue extension of biblical perspectives. A spirit of humility is essential, realising that there are vast unknowns and that the ground on which the debate is based is constantly shifting. But decisions have to be made, since the pressures for research and improved therapy will not disappear, and indeed should not disappear. It is in this spirit that I find myself most at home in category 3.

64 Bryant, J. & Searle, J. *Life in Our Hands*, Leicester: Inter-Varsity Press (2004).

65 Hui *op. cit.*, (6).

66 Shannon & Walter *op. cit.*, (11).

67 Peters *op. cit.*, (37), (38).

Theologians (and Christians in general) do not have the luxury of arguing that the use of ES cells should not be contemplated until all the theological and ethical questions have been resolved to everyone's satisfaction. This is an unrealistic and unhelpful response.

None of the writers I am discussing falls into *category 4*, which is also a position I reject. Since category 4 reflects the stance of those whose starting point lies outside the Hebraic-Christian tradition, I shall not discuss it any further in this article.

Blastocysts and the human community

Category 3, with its assertion that the Bible is one of a number of sources of concepts and information in determining the value of the blastocyst and ES cells, rather than *the* source, will alarm many Christians. However, it is hardly radical. It is of a kind with our approach to many other facets of human existence, whether human nutrition, immunology, public health, or community issues. While Christian perspectives are relevant in each case, we would find it strange if asked to outline which specific biblical principles (let alone texts) constitute the bedrock of these approaches. And yet, aberrations in any of these areas can have devastating consequences for the welfare of individuals and whole communities. In other words, human existence is readily devalued when essential nutritional and immunological principles are ignored, or when clean water supplies are unavailable, overcrowding is rampant, infectious diseases are uncontrolled, and social cohesion breaks down. Christian contributions come into their own when Christians, committed to the dignity and worth of every human being, set out to provide the basic necessities for a healthy life in these areas, melding together practical assistance and essential Christian values.

This provides a working model for approaching the human blastocyst and the derivation of ES cells. The dignity and worth of all in the human community are to be considered, even though conflict will sometimes arise between what may appear to be competing interests. Peters's emphasis upon claiming the dignity initially conferred by God⁶⁸ is important here, since it applies as much to disadvantaged children and adults as it does to blastocysts. If it proves impossible to bestow beneficence on all, a balance has to be found between maleficence and beneficence. In Christian language, one is striving for neighbour love, our neighbour being all in need, anyone whom we are in a position to assist: the patient with a debilitating disease, the person who has been abused, and the child with limited opportunities. Within this range of responsibilities, where do blastocysts feature? Are they in need in the way in which these others are in need, or is the only relevant need that of protection?

68 *ibid.*

Blastocysts are part of the human community, and yet they give the impression of occupying a different stratum from most others within this community. This is the root of our theological and ethical problems. They are ambiguous entities, regardless of what perspective one adopts towards them. The point I am making is that they never exist in isolation of others, even in the laboratory. Their existence and flourishing are dependent upon others within this community and on the relationships they have with others. This observation elicits two responses. Since they are the weakest of all human forms, they should be protected in all circumstances. Their dependence upon other human beings is the crucial ethical and theological driver, leading to opposition to their use in any research or therapeutic projects. An alternative response is to assess the worth of blastocysts alongside that of other human beings. It is a comparative worth. But once the claim of comparative, as opposed to absolute, worth is made, the whole tenor of ethical and theological discussion changes. This is because the relationships within the human community are brought to the fore, and the spotlight is directed onto human decision making, responsibility and control. How does this affect the embryo's standing as one who, potentially at least, is in the image of God? Is it demoted or enhanced?

My argument is that environmental factors have to be taken into account in determining the fate of blastocysts and the availability of ES cells. A distinction has to be made between 'blastocysts within an environment congenial to further development' and 'blastocysts within an environment hostile to further development'.⁶⁹ Blastocysts are found naturally, as well as artificially, in a range of environments, some of which enhance their ontogenetic development, whereas others hinder it. In other words, some blastocysts possess the inherent, as well as environmental, potential to become flourishing individuals; others lack this potential on one or other score.

It is possible to reject such a distinction and contend that isolated blastocysts have an inherent value in and of themselves. Their environment is irrelevant, even if they are unable to develop further. Their inherent potential demands that they be placed in a suitable environment; to deprive them of the latter is akin to depriving a postnatal human of oxygen. While this cannot be completely denied, there is a difference, namely, that a suitable environment for a blastocyst's development is an inherent part of what it is. It is not an add-on. The trophoctoderm is part of the blastocyst and not an external appendage. Hence, in the absence of trophoctodermal cells, and of a uterus in which to implant, the remaining cells of the blastocyst lack the potential to develop into a human individual. In view of these considerations, one has to ask whether commitment to all blastocysts, irrespective of their environment, is mandatory for Christians?

One approach is to argue that blastocysts are to be treated as persons, even

69 Towns & Jones *op. cit.*, (4)

though there are no scientific means of providing meaningful information on the question.⁷⁰ This position bypasses the environmental conundrum I have just raised. Similarly, the argument that there is a vital relationship between God and embryos that confers on embryos their unique status, will err on the side of early embryos.⁷¹ Does this hold when confronted by blastocysts that lack the potential of growing into the fullness of humanity, thereby suggesting that God has a vital relationship with innumerable blastocysts that will never be able to develop beyond a few days?

If God does have such a relationship with every blastocyst, I would argue that this makes it incumbent upon humans to provide the most congenial environment for the further development of every single blastocyst. Consequently, all blastocysts should be transferred to a woman's uterus, including possibly non-viable blastocysts and those with deleterious genes, no surplus embryos should be produced in IVF programs, blastocysts should never be studied in vitro in the laboratory, and any form of ES cell work is invalidated. The only legitimate Christian option is one characterised by opposition to embryo research and ES cell based therapies, as advocated by writers such as Hui.⁷²

But how do Christians respond to far from ideal situations or what they view as far from ideal situations? In the first category are women who smoke or drink alcohol during pregnancy, and the many other environmental hazards that may harm the developing embryo (and fetus). We may wish that embryos were not exposed to these hazards and we can argue for changes in behaviour on the part of pregnant women, but it is going to be impossible to eliminate all such hazards. In the second category are procedures used in IVF, such as the transfer of no more than one blastocyst (embryo) at a time, the aim of which is to lead to the birth of healthy offspring. With the state of the technology available today, the transfer of a number of blastocysts leads to multiple births, with the host of disadvantages this entails for mother and offspring. In other words, a procedure that may be viewed as upholding the dignity of blastocysts actually works against the human good. Christians have to confront these dilemmas, since they exist in the societies in which we live.

However, once the blastocysts' environment is taken into consideration, the theological imperative changes. God is not viewed as being committed to every blastocyst, neither is he seen as having a special relationship with every blastocyst. The emphasis has shifted to one in which God's call is seen as a way of viewing people, and not as a means of understanding human development in some quasi scientific sense. There is explicit acceptance that there is no way of

70 O'Donovan, O. *Begotten or Made?* Oxford: Oxford University Press (1984), pp. 59-60.

71 Hui *op. cit.*, (6); Stott *op. cit.*, (58), p. 362

72 Hui *op. cit.*, (6)

knowing whether every embryo is called.⁷³ We can agree that all people who are called were once embryos, and it would seem were called as embryos, but those who never made it beyond embryos remain an enigma.

It is at this point that one cannot escape entirely from the natural wastage of human embryos in early pregnancy. Approximately seventy per cent are lost prior to twelve weeks, the major causes being chromosomal abnormalities, uterine abnormalities, endocrine and immunological dysfunctions, plus idiopathic (unexplained) processes.⁷⁴ Infectious agents, environmental pollutants and psychogenetic factors also enter the picture. This rate of loss, with its multiplicity of causes, is a basic given that must colour our theological thinking. The pathologies are integral to development in a way in which childhood diseases are not, since we cannot even begin to formulate ways of tackling or even understanding such loss. This may change, but it is difficult to appreciate how that could take place without research into these causative factors, research that will involve human embryos themselves. Here again, the intention of either undertaking such research or refraining from it has to be confronted.

Perhaps we should be cautious in interfering with developing human embryos, but unless we adhere to the precautionary principle whereby the benefit of doubt is always to be given to the embryo,⁷⁵ research on some embryos will not be categorically ruled out. Some research of this ilk will be recognised as essential for the long-term welfare of embryos as a population, strange as such a notion may appear at first sight. Nevertheless, the dignity and worth of embryos will act as a major constraining force in what is done to and with them, on account of God's commitment to human tissue and all forms of human life.⁷⁶ This will lead to very demanding standards for any scientific work that is envisaged, with decision making taking account of the good of the human community as a whole. In particular, if blastocysts are brought into existence to serve as the source of tissues and cell lines, the intentions and goals of this procedure will have to be very closely scrutinised.

⁷³ One is reminded of Donald MacKay's argument that there is no biblical evidence in favour of the personhood of every ovum that has ever been fertilised ('The beginnings of personal life', *In the Service of Medicine* (1984) 30(2), 9-13). MacKay distinguished between Xs, fertilised ova spontaneously aborted very early in development, and Ns that will develop into normal infants and adults. Only the Ns will be able to look back at their life history and recognise the hand of God in their history.

⁷⁴ Bulletti, C., Flamigni, C., & Giacomucci, E., 'Reproductive failure due to spontaneous abortion and recurrent miscarriage', *Human Reproduction Update* (1996), 2, 118-136; Delhanty, J.D.A. 'Preimplantation genetics: an explanation for poor human fertility', *Annals of Human Genetics* (2001) 65, 331-338; Hardy, K., Spanos, S., Becker, D., Iannelli, P., Winston, R.M.L. & Stark, J. 'From cell death to embryo arrest: Mathematical models of human preimplantation embryo development', *Proceedings of the National Association of Sciences* (2001) 98, 1655-1660.

⁷⁵ See Stassen, G.H. & Gushee, D.P., *Kingdom Ethics*, Downers Grove, Illinois: InterVarsity Press (2003), pp. 222-223.

⁷⁶ Jones, D.G. 'The human embryo: Between oblivion and meaningful life', *Science and Christian Belief* (1994) 10, 3-19.

Contrasting perspectives

This is deeply ambivalent territory, and the pressure to prevent human embryos being demeaned (and ES cells utilised) is understandable. However, there has to be compelling theological evidence of the grounds for advocating a negative stance. Within a Christian framework the following appear to play a crucial role in forming such a stance.

- 1 There is explicit biblical evidence against the destruction of human embryos.
- 2 The thrust of the theological evidence is against the destruction of human life, including any prenatal human life.
- 3 The realm of the human embryo and human procreation should be left entirely as God's domain, and therefore should be off-limits to human-initiated intrusions.
- 4 Protection of human embryos outweighs efforts to improve the health of other humans.
- 5 The destruction of human embryos will have negative consequences for attitudes towards human life in general, and will lead to a culture of death.
- 6 Scientific inroads into the human person, by manipulating early developmental stages, will have long-term negative consequences for humanity.

Of these six grounds, 1 is an interpretation of the biblical evidence, while 2, 3 and 4 are theological statements. Numbers 5 and 6 are predictions of what might occur in the wake of continuing scientific work. When viewed as a package, the overall effect of these assertions is negative, with little indication that anything positive could emerge from ES cell investigations. The distinct impression is that the world would be a better place without any of these developments.

I remain to be convinced that there is biblical teaching or adequate theological rationale for opposing ES cell investigations in every conceivable circumstance. While reasons 5 and 6 should not be dismissed out of hand, the manner in which they are frequently expressed is far more assured than can be justified. Nevertheless, the deeply ambivalent nature of the territory demands caution at every level.

Proceeding with ES cell work also requires theological and scientific justification.

- 1 There is no specific biblical teaching against it.
- 2 The thrust of the theological evidence is that prenatal human life is of considerable value, and this should be assessed alongside the very considerable value of all human life.
- 3 The realm of the human embryo and human procreation comes within the

ambit of human creativity, as humans demonstrate elements of God's own creativity.

- 4 Theological vistas need to be grounded in the future as well as the past, in hope as well as fear, in God's purposes as well as human frailty.
- 5 The outcome of ES cell research could have major benefits for the human community overall.
- 6 The degree to which manipulating the early stages of human development will be beneficial or counter-productive will depend upon the goals to which it is directed: to benefit human welfare or serve unrealistic grandiose ends.

These reasons parallel the first set, and highlight the contrasting vistas. The biblical and theological basis is tipped towards the legitimacy of humans exercising control over the early stages of human existence, reflecting their creation in God's own image. Consequently, human responsibility comes far more to the fore, even though this can be abused. Hence, a balance has to be sought between the possible range of negative and positive repercussions, enormous care being required to ensure that legitimate exploitation of the pluripotential nature of ES cells is not obtained at the expense of unethical exploitation of human blastocysts.

Both sets of responses represent valid Christian stances, each with its own emphases and each with somewhat different perspectives on the relationship between God's initiative and human initiative. They highlight the varying extents to which scientific contributions are allowed to influence applied theological understandings, the different roles envisaged for the blastocyst as a contributing member of the human community, and the extent to which the blastocyst should be treated as an individual human subject or as belonging to a more general category of human tissue. These differences will determine the nature of our commitment to blastocysts over against other humans within the human community, and whether we allow the production of blastocysts in general as the source of stem cells for research and therapy, and of artificially-produced blastocysts as the source of tissues.

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