

## IVF AND STEM CELL RESEARCH

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 ANGLICAN ARCHBISHOP OF PERTH AND PRIMATE OF AUSTRALIA AT THE ANNUAL MEETING OF  
 BISHOPS, PERTH, 18 MARCH 2002

All Christians come to this topic with a shared theological commitment, as against some alternative set of beliefs such as that nothing made something, or that matter made itself, or that the universe is just a chance conglomeration of random happenings, and we come with a set of first order Christian moral commitments. Not least amongst these is the fundamental belief that because God created us as unique human individuals all human life is sacred. This at least is common ground amongst us. But, once we move from this shared first order moral commitment to make more detailed judgments of a second order kind relating to the application of these basic principles to particular situations, a wide variety of different opinion opens up before us. When opinions are in logical competition with one another, we have to grapple with the question of moral truth, for not every position will be equally justified by appeal to evidence or supported by adequate argument.

Since the widespread application of human reproductive technologies in the early 1980's moral debate has been dominated by some interrelated questions relating to the origin of life, such as 'When exactly does life begin?' or 'At what point is an embryo to be accorded the status of an individual human being, with rights to care, protection and, indeed, life?' These questions arose at the outset because of the destruction of some fertilized ova in the process of medically assisted reproduction procedures, given that only some fertilized ova are transferred to the uterus in the hope of achieving a conception while others are discarded. This raised the question: 'To what extent are IVF procedures acceptable at all?'

Then there are some more detailed moral questions. For example, in the treating of infertile couples by assisted reproduction procedures, the process of fertilisation may be aided so as to allow a sperm and an ovum to 'dock' more easily, as it were. The zona pellucida of the ovum is sometimes weakened so as to allow a sperm in. In this way fertilisation occurs in-vitro prior to implantation as the first step in the process of the conception of a human individual.

Now, the moral question that arises from this particular procedure is this: in allowing or assisting the sperm to penetrate the zona and to overcome some natural inability to do so (an inability that may not yet be fully understood), are we artificially, by human contrivance, over-coming a barrier that is operating in nature to prevent fertilisation from occurring ... and perhaps for some good reason? Perhaps the sperm is not making it, as it were, because it carries some genetic defect that would issue in some kind of inherited disease in the resulting child. In other words, perhaps there is a natural or God-given reason for screening out or not letting in some sperm. Are we running the risk of engineering deformities and inherited diseases by helping overcome a naturally erected barrier? In theological terms are we unwittingly thwarting the good purpose of God? I note that some recent research indicates that deformities are twice as likely in IVF children as in children naturally conceived, though 90% of IVF children are nevertheless born without defects.

This problem is increased by the more recently developed procedure known as ICSI - intracytoplasmic sperm injection. In this procedure, a sperm is first intentionally selected then actually injected right into the ovum. And the moral question attending this procedure is: are we heightening the risk of genetically inherited diseases by providing this ultimate degree of assistance?

As it turns out, this procedure has been in use in various parts of the world, now for quite a few years, notably in Belgium, and the figures to date seem promising. It does not seem to lead to any abnormal increase in birth defects. But, of course, some genetic diseases are late-onset diseases. We will not really know for some years if anything is wrong. So there is an element of risk and we must try to assess the risk and at the very least monitor experimentation very carefully.

Now, I think this concrete example illustrates that in this whole world there is often a certain sense of fear: we think of possible negative outcomes which tend to haunt us. How do we handle such fears? Well, I think it may help first to make a simple logical point. We must recognise that what is logically possible may not be an actual possibility at all. In other words, a thinkable risk may not be an actual risk. This is a basic point of logic. Some

things are just not possible as a matter of logic; it is just not possible even to think them without self-contradiction. It is not thinkable, for example, that there could be a bachelor who is also married. But it is possible without falling into a self-contradiction to think of a possible risk. However, whether it is an actual risk is an open question, and the degree of risk therefore has to be assessed. Often an issue can only be settled by proceeding with caution and by trial and error.

It is very easy to slip, however, from the realm of the logical to the actual, from what is thinkable to the realm of the real, so that just by thinking that there may be a risk the conclusion is drawn that the risk is real. So the logical point is: because something is logically possible, or thinkable without self-contradiction, it does not mean that it is actually possible. Whether thinkable risks associated with IVF procedures are actual risks or not can only be determined by assessing the degree of risk that may be involved and then proceeding with caution, by careful observation, investigation and research.

But, given the theoretical or thinkable risks that we imagine might be involved in reproductive technology, and a natural reticence about tampering with nature, and the need to weigh the risks, the abiding moral question inevitably arises: do we have a human right of entry to such a field at all? After all, the first use of the atomic bomb raised the question 'Should we ever have made it?' and the disaster at Chernobyl raises the question: 'Should we ever have got into the business of trying to generate electricity with nuclear reactors?' 'Will we live to regret it?'

Likewise, some may urge that we should adopt an attitude of conservatism and reverence, like Moses at the burning bush, in relation to our entry into the world of genetic engineering. Should we not take off our shoes and tread warily rather than be tempted to rush in where even angels may fear to tread ... into a very sensitive arena, at the very beginning of life, with all its unknowable mystery? Are we intruding into an arena which is properly the province of God, the ultimate author of all life? Are we, indeed, in a certain sense usurping the role of God, even playing at being God by creating life ... but also by destroying some life in the process?

Moreover, is modern reproductive technology and genetic engineering not only an intrusion into a sensitive area, but a kind of uncontrollable and stampeding force driven by an irresistible urge to break new barriers, no matter what the cost, that is careering out of control and that is threatening to the quality of our humanity? Should not science be controlled? And is it not tending to be confusing to family relationships to have to speak these days of 'social fathers' and 'genetic fathers', and of 'natural mothers' and 'surrogate mothers'? Is all this a kind of dehumanising process, even an ultimately inhuman process?

Well, in response to this kind of talk, some moral philosophers and theologians argue that, far from being essentially inhuman, the intentional human intervention in reproduction, and even genetic interventions, should be seen fundamentally as a step more towards the perfecting of the human, rather than the destruction of the human. Such procedures are therefore to be regarded as pro-human rather than anti-human.

One moral thinker, the American Anglican Joseph Fletcher, argues (if you can forgive the sexist language) that 'man is a maker, and a selector, and a designer, and the more rationally contrived and deliberate anything is, the more human it is'. The Roman Catholic Jesuit theologian of the last generation, Karl Rahner, also argued that 'the seemingly limitless capacity of man to experiment on himself is a sign of the creaturely freedom given to him by God'.

In other words, God has made us with a reason that elevates us above all other animals, and this distinctively human endowment, is intended to be used. What is willed, chosen, planned for, and rationally controlled is what distinguishes *homo sapiens* from other animals. This seems to suggest that the less random, less open to chance and the more planned and manipulated, the more human, not the less human, does it become.

This means that instead of resisting interventions using human reason in the evolutionary development of humankind, we should welcome it as a part of the process leading to an even higher order of creation. And, instead of usurping the role of God we can understand ourselves to be involved in a co-operative exercise aimed at the perfection of all things. The word 'pro-create', after all, means 'to create for'... to create for God. And if we can eliminate inherited disease from the process by gene therapy that too can be done for God and to the ultimate glory of God. In this case we can place assisted reproduction technology, along with both genetic research and gene therapy in the context of this broadly religious perspective on things.

Christians should not therefore adopt a fundamental attitude of suspicion and fear, let alone condemnation, with respect to the application of human reason and research to the area of human reproduction and the elimination of human imperfection by tackling inherited defects by gene therapy. So the simple answer at this stage to the moral and ethical question of 'are we intruding improperly into the province of God?' is: 'No. We are exercising our God-given abilities to act as stewards, and to complete and perfect the work of creation.'

However, that said, it is necessary to introduce a qualification. Rational control, it is true, is a distinctive achievement of humans. Whereas other animals are creatures of instinct, humans can reflect on their experience and with language can process and communicate knowledge both for their individual benefit and for the improvement of the lot of human society as a whole. Nevertheless, unfortunately not all human rational activity can produce results that we would call beneficial. Humans can use their rationality in inhuman ways: one can with deliberation and control do the most inhuman of things. Deliberation and rationality tells us only that a human being is acting, not that he or she is acting humanly and in the best interests of him or herself or of society.

From a Christian perspective the category of sin also reminds us of this, for, by definition, sin is a deliberate, rational, human choice of acts either of commission or omission that may be inhuman or anti-human and thus contrary to the will of God. Rational control, clearly, is not the guarantor of humane choices, but only the condition of their possibility: we can rationally and intentionally do what is right; but unfortunately we can also do what is wrong.

This means that we need to bring to the developing world of human reproductive technology and genetic research a set of criteria for determining what may be thought admissible and what would best be avoided.

We must therefore address the question of whether procedures that involve the discarding or sacrifice of fertilized ova, whether in the process of achieving at least a successful pregnancy or some advance in genetic therapy, perhaps by the harvesting of stem cells, are acceptable at all.

It is at this point that the question of when a human life actually begins becomes absolutely crucial. It impacts on the question of whether IVF procedures are to be countenanced at all, given that some fertilized ova may be discarded when the medical choice is made about which of a number of possible candidates for implantation is made. Likewise when fertilized ova are frozen for future use, legislation usually imposes a time limit on the keeping of frozen ova, which, when reached necessitates their destruction. In the area of stem cell research the harvesting of stem cells results in the destruction of the blastocyst. In all these areas the question of when precisely a human life may be said to have begun, or when an embryo is to be accorded the status of an individual human being with legal rights to protection and care, becomes absolutely and literally vital. Christians should not be confused about the fundamental principle of bioethics - the respect for human life and the derivative duty of the protection and preservation of life. But the pressing question is: When exactly is the embryo to be accorded the status of an individual human person or potential human person for whom these basic rights may be claimed?

To try and answer the question of when life begins is a little like trying to answer the question of when middle age begins. Clearly, in one sense life does not begin at fertilization since spermatozoa and oocytes are already alive in advance of fertilization; they are living cells and spermatozoa in particular display great activity. All that can be said is that a genetically novel kind of cell comes into existence at fertilization. The question is, at what point should a new creation of this kind be accorded the status of a human individual or a human subject?

Certainly the most vocal opposition first to the procedure of in vitro fertilization and more recently to research on embryos, including stem cell research, has come from those who recognise that the highest value must be accorded to the 'individual human person' and who assume that the human embryo must be accorded that status from the 'moment of conception'. Once the embryo is accorded the status of an 'individual human person', the loss and destruction of unwanted fertilized ova, the freezing of embryos, the possibility of scientific experimentation involving the ultimate destruction of fertilized ova, then assume the proportion of enormous moral problems. Thus the fundamental Roman Catholic objection to IVF in the late 1980s was on the grounds of the inevitable loss and destruction and possible harm done to 'newly conceived human beings'. But this raises the important question of whether what is grown in the glass dish to 8 or 16 cell stage rightly described as a 'newly conceived human being'?

This, for example, is the starting assumption of the Roman Catholic Archbishop of Sydney, George Pell, in an article published in *The Australian* on 22 August 2001 entitled 'Another Lamb to Slaughter'. In this article Dr Pell spoke of the human embryo, despite their minuscule size, as 'human subjects' which are destroyed in the processes of embryo research.

During the Sunday Angelus on 3 February 2002 Pope John Paul II said that science had demonstrated that we are dealing with a human individual with its own identity from the moment of fertilisation. This alleged scientific fact was said to have been supported by twelve professors from teaching faculties of medicine and surgery at five different Roman universities. This raises essentially the same question: is a fertilized ovum rightly regarded as 'a human subject'?

Those who have argued that from the moment of fertilization, the meeting of gametes, it is possible to affirm that a unique human individual has been conceived, follow a teaching of Pope Pius IX in 1869 who defined fertilization as the *moment* of conception and declared that abortion at all stages of pregnancy from fertilization on to be a sin punishable by excommunication.

Since 1869 theologians have also tended to speak of the embryo resulting from fertilization as being endowed with a human soul by God at that moment. But this has not always been the case. Augustine thought of 'ensoulment' as a distinct additional act of God at around the 46th day after fertilisation. Aquinas thought that ensoulment happened 40 days after fertilisation in the case of males and 90 days after fertilisation in the case of females. Nevertheless, we are heirs of the mid-nineteenth century view that fertilisation and conception occur at the same moment. The question is: In the light of more recent scientific information, can we continue to assume that fertilization of the ovum by a sperm is 'the moment of conception'? I am of the view that the initial problem here is in the first instance one of semantic promiscuity, involving an illicit logical move from talk of 'fertilization' to talk of 'conception'. The question is: are these synonymous terms? I think the physiological evidence indicates quite clearly that they are most certainly not.

For one thing, what comes into existence at fertilization has the potentiality for becoming a human individual only if a third condition is present. This is its successful implantation in the lining of the womb. It quite simply does not have this potentiality if it is not implanted. Also, given recent advances in our understanding of the development of the embryo, we must begin to think of conception less as a *moment* and more in gradual and continuous terms as a *process*. During the course of this process, which takes some days, the embryo may divide and give rise to identical twins. If we insist that the embryo is endowed with a soul from the moment of fertilization are we then, in the case of twinning, to say that one soul has become two souls? Moreover, I understand from the literature that sometimes the two divided parts may reunite in a process termed mosaicism. In this case, instead of identical twins only a single child results. It would be logically necessary, on the view which is being discussed, to suppose that two souls have united to become a single soul. This should alert us to exercise caution in relation to soul talk - and certainly to the question whether fertilization of an ovum can be identified as being synonymous with the conception of a human individual.

It is only at implantation at the earliest that we even can begin to say that conception has occurred. This would be about seven day's after fertilisation. But even here it is necessary to note that implantation is itself a process and, during the process of implantation, significant changes occur in the embryo, all of which, it seems to me, must be completed before it is possible to say categorically that 'a unique individual has been conceived'.

If this sounds somewhat new, it is in fact not nearly as new as it may seem. I first learned the importance of distinguishing between fertilisation and conception in the late 1970s from Professor Gordon Dunstan who at the time taught ethics at the University of London. Before IVF became a topic of discussion, Dunstan used this distinction in discussing the question of abortion after rape. He pointed out that in fact immediately after rape no human individual would have yet been conceived. There was therefore no question of talking of abortion. Rather it was a matter of curettage.

In England, Dunstan was very influential at the time of the Warnock Report of the Committee of Inquiry into Human Fertilization and Embryology, which made the point that at the time the blastocyst begins to implant, a plate of cells is formed between the two cystic spaces within the blastocyst, which is described as the embryonic disc and within it the first recognizable features of the embryo proper begin to appear. The first of these features is the primitive streak, which appears as a heaping up of cells at one end of the embryonic disc on the fourteenth or fifteenth day after fertilization. Two primitive streaks may form in a single embryonic disc - this is the latest stage at which identical twins can occur - the primitive streak is the first of several identifiable features which

develop in and from the embryonic disc during the succeeding days, a period of very rapid change in the embryonic configuration. By the seventeenth day, the neural groove appears and by the twentysecond to twenty-third day this has developed to become the neural folds which in turn start to fuse and form the recognizable antecedent of the spinal cord.

In other words, until the blastocyst stage has been reached, the embryo in vivo is unattached, floating first in the fallopian tube and then in the uterine cavity. From the sixth to twelfth or thirteenth day internal development proceeds within the blastocyst while, during the same period, implantation is taking place. *Both* internal and external processes of development are crucial to the future of the embryo. If implantation does not occur, the blastocyst is lost at or before the next menstrual period; if the inner cell mass does not form within the blastocyst, it does not have the potentiality to develop into a human individual. Given that twinning can occur up to the fourteenth day of this process, it is not logically possible to talk of the conception of a unique human individual (as distinct from the fertilization of an ovum) prior to the completion of this process. That is to say, the process of conception is a fourteen day process. Each of us can say that we came to be in the sense that we were each conceived, as a potential human individual fourteen days after the fertilization of an ovum and not before.

Now this is very fundamental information for the resolving of the conflict of ideas with regard to the moral issues involved in in-vitro fertilization, though in public debate it has not been recognised in this country and, even in recent professional literature, it is regularly overlooked.

Clearly, this teasing out of current confusion in our language is of the most momentous importance to resolving difficulties relating to the practice of IVF, not to mention the more recent development of stem cell research. It is important to note that the question of when life is to be accorded the status of a conceived human individual with rights to protection and care is in the first instance a physiological question, not just a theological question. It is certainly not a question which can be arbitrarily decided on the basis of the level of scientific knowledge as it stood in the middle of the nineteenth century.

Once we come to terms with the physiological facts and are in a position to distinguish between fertilization of an ovum and the conception of a human individual a number of troublesome difficulties fall away. First of all, the natural wastage rate of fertilized ova (which is said to be in the order of 60%!) because of failure to implant, no longer throws up the problem posed by the apparent natural loss of very high numbers of 'conceived human individuals'. We quite simply are not talking of 'conceived human beings' who never see the light of day.

Also, strictly speaking, all popular talk of the conception of human individuals in a test tube is incorrect. What occurs in the test tube prior to implantation, whilst being rightly called fertilization, is not correctly called conception. What takes place in the test-tube is at best the beginning of the process of embryo genesis; we rightly talk of in-vitro *fertilization*; strictly it would be incorrect to speak of in-vitro conception, and I am gratified that we do not use this construction. We rightly speak of IVF not IVC.

Just to clinch this argument it is useful to note that the word *conception* is a translation of the Latin *conceptio* which means 'I hold on to' or 'I retain'. It refers to the retaining of the menstrual blood by a woman. This occurs after implantation, at around day fourteen after fertilisation. This is why it is possible to say both 'a child has been conceived' and 'she conceived and bore a son.' Conception which is complete at the end of the process of implantation happens in relation to the woman 'who conceives' at the same time as a child 'is conceived'.

Furthermore, the status of the embryo in the first fourteen days is clearly different from its status with rights of protection as a 'conceived human individual' after the fourteen day process of conception is complete. Though up to fourteen days we are dealing with human genetic material which, as such, should be treated with respect, and certainly not frivolously, the inevitable loss of fertilized ova is not to be regarded as the killing of 'conceived human individuals' or the slaughter of 'human subjects'. Freezing of fertilized ova also seems more congenial once we are clear that we are not dealing with 'newly conceived human individuals'. We do not have some 25000 frozen people on ice at various places around Australia.

It also follows that growth of cells in the test tube is unlikely to be allowed after fourteen days but, on the other hand, I think if there is a utilitarian argument for the possible benefit to mankind of experimentation on embryos, this could be tolerated in a controlled way under license up to the fourteenth day in a way that after the fourteenth day it would not. Stem cell research seems also thinkable, for stem cells are harvested within the

fourteen day period prior to the completion of the process of conception. We may think of this in terms of a radical form of contraception, but not in terms of the killing of an already conceived human individual.

It is sometimes said that stem cells obtained from adults or from the umbilical cords of recently born babies could do just as well, and would not involve the destruction of the blastocyst. There are two problems. The first is that cells 'remember their age'. The cloned sheep Dolly was cloned from the cells of an adult sheep. Unfortunately this means that Dolly is old before her time and already suffers from arthritis. It is important to harvest stem cells at the earliest possible time. Also stem cells obtained from sources other than the embryo are not totally reliable for research purposes. For example, in order to deal with Parkinson's disease appropriate cells would be hard to find and might require the removal of a large section of brain! Cells derived from umbilical cords do not have the potential of embryonic stem cells. It might not be possible to reproduce nervous tissue from them, for example. Clearly, the need from a scientific point of view to harvest embryonic stem cells cannot be entirely answered by harvesting adult or umbilical cord cells.

To sum up, the argument of this paper is that much of the confusion in the current Australian debate comes from assuming that fertilization and conception are synonymous. Once we are more clear about what actually happens in physiological terms we can begin to see what ethical norms should result, given that we still have a very considerable work to do of a detailed moral and legal kind.