

An Ethical Look at Human-Animal Embryos

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The Human Fertilisation and Embryology Bill begins its Second Reading in the House of Commons this week. Amongst other controversial measures, it will permit the creation of 'admixed' embryos that are part human and part animal. Bioethicist, Dr David Jones, examines the ethical issues behind this by dealing with ten frequently-asked questions on the subject.

From my work as a bioethicist, I have gathered together ten questions that people have asked me about the ethics of embryo experimentation. Often the questions represent a challenge to my own view – indeed, I have deliberately chosen those questions that seem most difficult, attempting to give the clearest answer I can. Although I am a Catholic, the arguments and conclusions I come to should not be taken as representing the official view of any group or organization. Many of these questions are new and perplexing, and reasonable people differ both on the conclusions and on the evidence, but these questions must be faced: the law must either prohibit or permit (and if permit, perhaps under certain conditions) the creation of hybrid embryos, and if those who make these decisions do not reflect on the deeper questions then they risk basing their actions on unexamined prejudices.

1. Without appealing to religion, is there any reason to think that from fertilisation there is a new human life? Isn't the early embryo just a ball of cells?

Yes, there is good reason to think that a new human life generally begins at fertilisation (except in the case of identical twins and clones).

In general terms, an embryo is the first stage in the life of an organism, before it is born or hatched, when it does not yet have its final shape. An embryo is relatively 'unformed'. A human embryo is a human offspring in its first eight weeks of development after



which it becomes a 'foetus'. In the terms of the Human Fertilisation and Embryology Bill, a human embryo includes 'an egg that is in the process of fertilisation or is undergoing any other process capable of resulting in an embryo' (the second clause is needed to take account of the possibility of cloning). This definition seems fair and reasonable.

When biologists look at embryological development they start counting from the beginning of fertilisation. The same is true in law. The 1990 Act allows experimentation on human embryos up to 14 days. From what point is the law counting? This way of framing the law bears witness to the significance of fertilisation as the *terminus a quo*. Both scientists and lawmakers, quite reasonably, start counting at fertilisation.

It is of course true that there are deep differences as to the proper *moral* status of the embryo but there is widespread agreement that a human embryo *begins* at fertilisation. As an embryo begins at fertilisation, and as the embryonic stage is the first stage of a new life, then a new life begins at fertilisation (except for identical twins and cloned embryos, where the beginning is a little different). It was this same starting point that the World Medical Association had in mind in 1948 when they set out the Geneva Declaration on medical ethics. They required doctors to 'maintain the utmost respect for human life from the time of conception', meaning from fertilisation. There are doctors who disagree with this as an ethical view, but it seems clear enough why the declaration

takes fertilisation as the biological beginning point. A human embryo begins life as a fertilised egg, a single cell, and then divides internally to become a small ball of cells. This 'ball of cells' is the first stage of a developing human life and therefore it has special human significance.

2. How can anyone seriously believe that the early embryo has the same moral status as a twenty-four week foetus or as a newborn baby? Isn't it obvious that there is a gradual growth in value or moral status from fertilisation to birth?

In my view the human embryo does not have the same range of rights as the newborn baby, but it is the first stage of a human life and has at least the right not to be deliberately destroyed. The human embryo deserves real protection in law.

Human life consists in continuity and change, equality and inequality. For those who are not identical twins, the beginning of the embryo was the beginning of their life. If we had a scrap book of pictures of our childhood, these days it might start with a series of ultrasound scans, and in principle, if we were born by IVF, it could start with a photograph of a particular embryo that was transferred to the womb. There is continuity and change.

There is change: the embryo is not yet conscious – it has no feelings to hurt; and it is not yet able to think – it has no opinions to ignore. An embryo does not affect our emotions as a foetus or a newborn child does. It has no face or hands and feet as yet. The physical reality of destroying an embryo is a very different act to dismembering a twelve week foetus. This should affect us differently. The changes that take place as life progresses give us an increasing range of rights we do not have before.

Nevertheless, beneath this change there is also continuity. The human embryo deserves respect as the very first stage of a new human existence. An embryo is developing into a foetus. A foetus is on its way to birth. A newborn infant is learning and growing. If the individual is treated with care he or she will develop. The basic right, the minimal care, demanded by a human being at every stage of

development is to be supported in this process of development and not to be destroyed. Ethically this must mean, at the very least, embryos should not be deliberately created for experimental purposes. They should have a chance of developing. That is why most countries in Europe do not allow the creating of embryos for research.

It is worth mentioning the argument of several contemporary philosophers who agree that a 'human life' or a 'human being' begins at fertilisation, but who say that 'personhood' begins later. According to this way of thinking, personhood is related to awareness and rationality and to the ability to make contracts and it is this that makes people more valuable than other animals. This is an influential philosophical idea, but it is ethically flawed. Personhood excludes newborn babies. Babies are not rational persons who make contracts. Yet we protect babies because they are our offspring and they have a whole life ahead of them. We recognize our common humanity. Human infants are not on a moral par with pigs or rats or tuna, whatever some modern philosophers might claim. Embryos are not yet newborn babies but they have started out on a human journey and they also demand respect as human.

3. If you can now create embryos from parthenogenesis (i.e. without the need for male fertilisation of the egg) – and potentially from any cell in the body by de-differentiation – don't we have to think now about all human cells being 'potential' human lives? Doesn't this fatally undermine the idea that there is something 'special' about the embryo?

This would be a real problem if we were genuinely confused as to what is a human embryo. However, we do not generally have a difficulty distinguishing other cells from embryos.

Even after 'parthenotes' (eggs artificially activated without sperm) have been created and after skins cells have been de-differentiated, neither scientists nor lawyers feel the need to call unfertilised eggs and somatic cells 'embryos'. Embryos are recognized from the process of development that they are undergoing, and unfertilised eggs and body cells are not

developing in this way. Eggs are gametes that can become an embryo. Generally this happens through fertilisation but it might happen through some other process, as the Bill now recognizes. In all cases something has to happen to the egg before it becomes an embryo. This is even more true of a skin cell. A skin cell is not even a gamete but could potentially become one.

There may be cases where we are in genuine doubt as to whether something is an embryo. However, even in cases where it is not clear if something is an embryo, that should not undermine the special status of the human embryo. Skin cells and unfertilised eggs are not embryos. Embryos have begun the process of human development. They are on this side of an important line.

4. Surely if the human-animal embryo is not human then it is better to use it than a human embryo? Shouldn't you be welcoming this rather than objecting to it as a way of avoiding the creation and destruction of new human life?

One kind of human-animal embryo, the 'cybrid' is regarded by most scientists as '99.9% human' or 'categorically human'. From an ethical point of view, a human-cow cybrid should probably be regarded as a human embryo that has been created using a transplant from a cow. If a cybrid embryo is a kind of human embryo, as most scientists argue, then to use it in research is ethically at least as problematic as other forms of embryo experimentation. It does involve the creation and destruction of new human lives. It also involves mixing some material from another species.

It is more difficult to know what to think about 'true hybrids' which are the most extreme kind of human-animal embryo permitted by the Bill. True hybrids are made by mixing sperm and egg from different species and would be 50% human and 50% of some other species. This raises the issue about whether there is something wrong with crossing the species barrier. This is easiest to see if we ask what would be wrong with bringing a half-human half-chimpanzee to birth. The primary issue here is not how much protection to give to a 'humanzee', it is whether we should allow scientists to create humanzees in the

first place (this was actually attempted by soviet and other scientists in the 1920s but happily none succeeded). The act of creating true hybrids seems to be inhuman. It fails to respect our humanity.

5. Isn't talk of live born animal-human hybrids scaremongering? No one is planning to bring them to birth and, as long as they are destroyed before 14 days, there is no problem.

It is not scaremongering to talk of half-and-half hybrid embryos, as these are permitted in law. We should ask what, if anything, is wrong with crossing humans and other species, and ask whether this also applies to embryos.

The Human Fertilisation and Embryology Bill permits the creation of true hybrid embryos from the sperm of a man and the egg of an animal, or from the egg of a woman and the sperm of an animal. This represents the most extreme form of mixing of human and nonhuman and certainly it should not be accepted without a very strong justification. Currently no scientist is asking to create them, which means Parliament is giving a blank cheque to the regulator, with little idea what the supposed justification would be.

It is inhuman to cross humans and other species of animals, and most people would agree that it is seriously wrong to bring such a creature to birth. However, if the embryo is already the first stage of development of an animal, then a hybrid embryo is already the beginning of a half-human half-nonhuman creature. An embryo is always an embryo of something: a human embryo, a pig embryo, a chimpanzee embryo etc. In law and ethics we treat embryos of different species differently. The question is: what species is a true hybrid embryo? Even if it does not come to birth, it is already heading in a certain developmental direction. What is it the embryonic stage of? What is it the beginning of? This is the ethical problem with creating true hybrid embryos: they already cross the species barrier, for the embryo is already a new life.

There is also another argument, the 'slippery slope' argument. This is a difficult form of argument and is

strong only when there is some empirical evidence of momentum and when the end point is clearly unacceptable. In the case of bringing true hybrids to birth it seems that the end point is clearly unacceptable. Is there evidence of dangerous momentum in this direction? Unfortunately there is. In 1990 true hybrids were prohibited, as was cloning by embryo splitting. In 2001 cloning embryos was allowed but not the placing of these embryos in a woman. Politicians were scathing about the idea that there could be a slippery slope to reproductive cloning. However, only seven years later the present Bill is proposing to legalize reproductive cloning (for women with mitochondrial disease). The Human Reproductive Cloning Act is quietly being repealed! This is much sooner than I for one would have imagined in 2001. Similarly, creating true hybrids was declared to be unacceptable and unethical in 1990 and yet is now proposed to be legalized without anyone being able to point to any specific benefit. The last twenty years has thus seen increasing momentum in favour of allowing more and more bizarre kinds of experiment for less and less reason. In these circumstances there is a strong pragmatic argument for drawing clear lines when they can be drawn. True hybrid embryos should not be permitted.

6. Is the human-animal embryo even an embryo? After all, it does not originate from fertilisation in the ordinary way and it has no potential to develop if we do not implant it.

Yes, it is an embryo, and the law is helpfully clear on this.

In 1990, the embryo was defined in terms of fertilisation, but after the cloning of Dolly the sheep it became clear that a new life could be created without fertilisation. The new Bill has taken account of this in its definition of the embryo. A cloned human embryo would still be a human embryo and, in principle, could develop to birth.

Is this also true of human-animal 'embryos'? Are these genuine embryos? Biologically they seem to be embryos in that they follow a similar pattern of early development. The law is clear that they are embryos

for legal purposes. Most significant is the way that scientists and lawyers have stressed the need to forbid the placing of a hybrid embryo in a woman or in an animal. The fear is clearly that there is at least some tiny chance that such an embryo would come to term and be born. However, if something can develop into a foetus then it is clearly an embryo. This is what an embryo is, the first stage of the development of an organism.

7. Is there any new moral issue here? Haven't scientists been combining animal and human material for years? What about the 'hamster test'?

Yes, it is new. What has happened before does not amount to the same thing.

There has been combination of animal and human cells before, but cells are not animals and the mixing of biological material is not at all the same as the creation of a creature that is part-human, part-nonhuman.

It is also true that scientists have created mouse human chimeras by injecting human cells into mice, or genetically engineering mice and other animals with human genes. The genetic modification of animals has been controversial, but there is a clear difference to what is now proposed. These modified animals are clearly not human, whereas human-animal embryos are predominantly human or at least half-human.

Some people also point to the hamster test which was allowed in the 1990 Act. This test involved fertilising a hamster egg with human sperm to test for the fertility of sperm. It is no longer used in clinical practice but was used up until 2003. However, it is important to note that the 1990 Act required that the human-hamster embryo be destroyed at or before the two cell stage. Ministers talked of it being destroyed 'immediately'. Why was this? Clearly because they did not want to allow the development of a hybrid embryo. Permission was given to test the fertility of sperm but there was never any intention to do research on the resulting hybrid embryos. The intention was that the embryos would be destroyed at the one cell stage before fertilisation

was complete. It was in this context that the 1990 Act explicitly forbade the mixing of eggs and sperm from different species for research purposes. This prohibition was regarded at the time as an important ethical safeguard.

This Bill is unprecedented in what it allows and it is disingenuous to pretend that it is 'more of the same'. If parliament decides to permit some or all kinds of human-animal embryos, MPs should be aware that they are breaking new and uncharted ground.

8. In a pluralist society what right has a religious minority to impose religious views on everyone else?

A religious minority should not impose religious views, but it is not only a minority or just religious people who object to crossing humans with other animals. In polls, up to 67% of people oppose creating hybrids, depending on how you ask the question. As less than 10% of people in Britain are weekly attenders at churches and other places of worship, clearly most of those who are uneasy about animal-human hybrids are not strongly religious.

The relation of religion to ethics is complex. Religion often inspires people to take up ethical causes. For example, the abolition of slavery in this country, and the first laws against cruelty to animals, were spearheaded by religious people. However, even though religious people may get involved, these ethical causes are generally matters for everyone, matters of common concern. Ethics is a matter of being human. It is equally true that religious people sometimes act in ways that are unethical or fail to defend the cause of justice.

It is easy to be suspicious of people who have a different religion to you. However, people should not be excluded from the debate or from public life just because they are religious. They may sometimes express ethical issues in religious language, but they will be asking questions that everyone asks: what is ethical, good, or right for human beings? It is not a matter of imposing one religion's view but of deciding together what is best for our society. The question of whether we should cross human beings

with other species to create human-animal embryos is also a question for everyone.

9. Should those who oppose this research refuse to use any medical treatments that it produces?

In some cases, no; in some cases, yes.

However, it would be wrong to accept uncritically the claim, implicit in the question, that there is a reasonable likelihood of treatments coming from this research. Professor Austin Smith (who is one of the foremost stem cell scientists in the United Kingdom, is not a Catholic, and is not opposed in principle to experimentation on human embryos) has said that cloning human embryos for research 'has limited potential for treating disease and adds little to scientific understanding of human biology'. Despite the hype it seems highly unlikely that this research will lead to treatments that could not have been developed in some other way.

If, hypothetically, in the future a treatment were ever developed as a result of embryo experimentation, would it be ethical to accept the treatment? It depends on the details, for example:

If the treatment (a new drug for example) is the result of knowledge which was discovered using human embryos, but knowledge which could have been discovered in some other way, then it can be used. The treatment is not essentially unethical. If we lived in a more ethical society then the same knowledge would have been discovered in a more ethical way.

On the other hand, if the treatment relies on continuing to destroy embryos then it could not be used. For example, if the 'treatment' involved making a cloned embryo from my DNA and the egg of a woman, my wife for example, and then destroying our embryo for its cells, then as someone who opposes embryo destruction I could not accept that treatment, nor could I advise anyone else to. Most scientists now agree that it is very unlikely that 'therapeutic cloning' will ever provide treatments in this way. However, if such a treatment were developed, I would consider it unethical to use it.

10. Don't we have an ethical duty to pursue this research if it might lead to cures for diseases such as Parkinson's and Alzheimer's? What real, ethical objection is there to keeping all avenues open, provided that all the research is done on very early-stage embryos?

We do have an ethical duty to pursue ethical and scientifically promising research that might lead to future cures, but research on human-animal embryos is unethical and its promise is disputed. We have a duty to look for ethical alternatives to research that is ethically dubious.

Scientific research is an important human good. Advancing in knowledge and understanding is part of the good of society, and it is doubly so when this knowledge is also useful to heal the sick or to alleviate suffering. Nevertheless, scientific research must also be conducted ethically, it must respect various other human goods, such as the needs and rights of research subjects. It is wrong to experiment on someone against his or her will, even if that person is a convicted criminal. The research proposal also has to have some realistic promise of advancing knowledge. An ill-thought-out experiment is also an unethical experiment, for risks are taken for no benefit. When research involves some harm to animals then scientists have a duty to show the experiment is needed.

Research on human-animal embryos is unethical because it deliberately creates and then destroys human embryos. It is also unethical because it is the

first step towards crossing the species barrier and creating true hybrids. If it is unethical it should not be done and we should look for alternative ways solve the problem. Happily the number of ethically acceptable sources of stem cells is increasing all the time. Adult stem cell research is making steady progress and there has been an extraordinary breakthrough by Japanese scientists who have turned skin cells into stem cells without creating and destroying a human embryo. The search for alternatives should continue, but even now it cannot be claimed that human-animal embryos are really necessary for stem cell research. These experiments were done in China in 2003 but were not repeated and very few countries have shown any interest in this work. No scientist would prefer to work with a stem cell from a human-animal embryo if he or she could find a good source of pure human stem cells.

Not everyone agrees that creating human-animal embryos or destroying human embryos is *always* unacceptable. However everyone should agree that it would be wrong to experiment on human and human-animal embryos if the same benefits could be derived from working on other cells: bone marrow, blood from the umbilical cord or even from skin cells. We should not tolerate unethical research but should keep open all ethical avenues and should be constantly seeking for new, ethically acceptable avenues to explore.

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