

Church of England - Mission and Public Affairs Council

Response to the Academy of Medical Sciences' Call for Evidence: 'Animals Containing Human Material' February 2010

The Mission & Public Affairs Council of the Church of England is the body responsible for overseeing research and comment on social and political issues on behalf of the Church. The Council comprises a representative group of bishops, clergy and lay people with interest and expertise in the relevant areas, and reports to the General Synod through the Archbishops' Council.

1. We welcome this opportunity to submit evidence to this study. As the study and the programme of public engagement progress over the next eighteen months we intend to develop further our own contribution to the discussion.

2. We note that:

‘The scope of the study is to: examine the scientific, social, ethical, safety and regulatory aspects of research involving non-human embryos and animals containing human material. More specifically, the project will seek to:

- Agree definitions for animals, and animal embryos, containing human genetic or cellular material.
- Describe the current use of animals containing human material in medical research, and to anticipate future research directions and challenges for this work.
- Assess future applications of research involving animals containing human material – including potential requirements for preclinical (animal) studies of candidate human stem cell therapies.
- Address safety concerns surrounding the generation and use of animals containing human material in research, and to consider welfare issues which apply specifically to animals containing human material.
- Explore societal and ethical aspects of medical research involving the creation of animals that include significant amounts of human material, and to develop a constructive public dialogue in this area.
- Explore the current and future regulation of the use of animals and embryos containing human material for research purposes, including primary legislation, regulations and guidelines.
- Draw conclusions and make recommendations for action.’

3. We recognise the importance of this study and the pivotal role it may play in the formulation of future legislation and regulation in the United Kingdom. We also recognise that similar studies and guidelines have been, and are being, debated in other countries.

4. While each area of enquiry outlined above is of significance, we intend, in the main, to comment on those topics where we feel that we have a particular contribution to make and which are of particular concern to us. These are:

- (i) Definitions of animals and animal embryos containing human genetic or cellular material;

(ii) Societal and ethical aspects of medical research involving the creation of animals that include significant amounts of human material

(iii) Welfare issues which apply specifically to animals containing human material

5. As requested in the Academy's Call for Evidence, other than where necessary to contextualize an argument, we shall not comment *generally* on the ethics of animal research, on admixed embryos or on embryo research.

Guiding Principles

6. This is a complex and challenging area of study. It involves practices and potential outcomes that only a few decades ago would have seemed fantastical. Some of these may challenge deep-seated assumptions that have historically helped to form part of the fabric of human society. It is not possible properly to examine this topic without engaging with a range of issues that extend beyond purely scientific concerns. As such, the discussion may, at times, appear to be abstract but this is necessary in order to set in its proper context the types of research under review.

7. Setting in place some initial principles is necessary in navigating the philosophical, ethical and scientific issues that arise in an exploration of animals containing human material. Some of these principles may appear to be self-evident or obvious but, nonetheless, they are needed in establishing a framework for informed discussion.

(i) Certain types of research may be possible and potentially beneficial but not acceptable because they are unethical. For example, some experiments conducted by the Nazi regime clearly fall into this category. In other words, 'can do' does not imply 'may do'. This is a simple but important principle since the 'potential benefit' argument, as popularly presented, may appear as something of a trump card that beats all other arguments.

(ii) Research may challenge some of our most fundamental beliefs and presuppositions but this is not sufficient reason to prohibit or to restrict it. Many scientific or medical techniques and practices that most people currently accept, such as organ transplantation or the use of psychiatric drugs were once widely deemed to be unacceptable because they challenged prevalent interpretations of human identity and personality. Fundamental beliefs may, at times, act as an initial defence mechanism against untrammelled experimentation but it is correct to challenge such beliefs and to engage in thoroughgoing discussion with regard to their veracity and significance.

(iii) While it is correct to examine each component part of a system, care ought to be taken to avoid reductionism. As we examine ever smaller constituent parts of a system it is often difficult to keep the whole system in mind. This may be the case when we examine the physical basis for sentience or consciousness. It is, as yet, impossible to explain the existence of sentience by examining sub-atomic particles but these form the building blocks of all matter from which such life has emerged. It would be a grave mistake to disregard the reality and existence of sentience and its

ethical importance because we can find no basis for it once we break human or animal life down into its constituent parts.

(iv) Whilst some moral debates can be resolved by appealing to straightforward categories of right and wrong, some, including the current debate, involve competing goods and questions of risk and so are not susceptible to resolution on such clear-cut grounds. Consequently, we have to approach such issues by trying to establish what is normative and then set out to identify what practices may be non-normative but acceptable/ permissible and which may be termed ‘anti-normative’ and, consequently, unacceptable. For example, it could be argued that preserving life is normative, killing in self defence is non-normative but permissible while murder is anti-normative and, hence, unacceptable.

(v) As well as meeting other criteria, in order to be ethically acceptable, experimentation ought to be scientifically justifiable. Resources ought not to be expended on research that has little prospect either of success or of rendering beneficial conclusions.

(vi) Research is possible because we, as humans, conceive, devise and conduct it. We are participants in research, not disinterested observers. In talking, for example, of the relative moral status of humans and animals we cannot act as though we were a third party commenting on two other kinds of beings. We, as humans, ascribe moral status to ourselves and to animals and we, as humans, reflect on the nature of our own humanity. We ought not to think that we can reflect or act objectively with regard to research involving humans or human material.

(vii) It is not necessary for all ethical discussions to be built up from first principles or for a shared philosophical base to be established for ethical arguments to be considered and even agreed. For example, while, for our part, as the Church, ethical arguments are based, to a degree, on theological considerations (e.g. humans being made in the image of God), it is not necessary for others to share this theological outlook in order to entertain or even to agree with the ethical arguments that emerge from it. People can arrive at similar ethical principles via a number of routes and from disparate starting points. Only were we to suggest that an argument ought to be accepted solely on the grounds of its theological basis would it be correct for others, who do not share our perspective, to dismiss it. (The Danish Council of Ethics’ report on The Ethics of Human – Non-human Chimera Research, for example, shares many of our conclusions but arrives at them from a different starting point)

Definitions for animals, and animal embryos, containing human genetic or cellular material

8. While the focus of this study is animals containing human material it is not possible to seek a definition of animals and animal embryos containing human genetic or cellular material without first coming to an agreement on what we understand by the term ‘animal’. In the context of this study this, inevitably, also leads us to seek an understanding of what it means to be human.

9. The simplest way to begin this complex enquiry is to look at humans and animals *prior* to any scientific or medical modification at either a genetic or anatomical level.

10. Correctly, distinctions have been made between the categories: human material, human beings and human persons. Not dissimilar distinctions may be made between the categories: animal material, animals and sentient animals. Both of these are ascending series in that the logic of the categories requires that a human person must also be a human being composed of human material that conforms to the genetic range found within the human genome. The difficulty, however, lies in finding satisfactory definitions for each of these categories.

Definitions of ‘Human’

11. Human material may be thought of as anything containing human DNA but once we ask what human DNA is we realise that we are not dealing with a precise and fixed substance, but rather with genetic material that lies within a certain spectrum. One human’s DNA differs from another’s but both fall within a range that we identify as the human genome. The human genome, however, admits variation from person to person. Precisely how much variation or mutation is ‘permitted’ within the human genome is unclear; is there a point at which one more variation would herald the advent of a new species? Presumably, the answer must be ‘yes’, but where that point would lie, no one, at present, is able to say.

12. Human beings are beings that conform to their human genome, but clearly, having a human genome does not make an entity a human being. Individual cells, hydatidiform moles and placentas, for example, are composed of human material, but are not human beings. In order for *a* human being to exist, the human genetic material must have formed into an identifiable single human life: a human individual. This seems to be relatively straightforward but it is not without its difficulties. It recognises differentiated embryo and fetuses as human beings but not undifferentiated embryos, a controversial assertion for some. It also fails fully to address the issue of conjoined twins which form after embryonic differentiation has occurred. Some asymmetrical conjoined twins, in particular, highlight the question of whether in these instances we are dealing with one human being or two.

13. The greatest difficulty lies, however, in defining a human person. Theological concepts such as the image of God or the soul may be entirely valid but do little to help us, in practice, as these are best understood as terms describing what human persons *are* rather than terms describing which types of properties or characteristics human persons may possess. All attempts to define a human person in terms of faculties such as intelligence or speech, in terms of relationships or in terms of physical characteristics such as brain structure fail to address the borders of personhood. Babies, the comatose, those with advanced dementia, even people in a deep sleep would be characterised as non-persons or temporary non-persons if a simple faculty approach is taken. Inevitably, concepts such as personal potential and personal history have to be introduced in order to safeguard the personhood of those who may fail to make the grade on a simple examination of whether or not they possess certain faculties that we normally associate with personhood. In principle, a further difficulty arises in that *Homo sapiens* is but one branch of the human genus;

for example, *Homo erectus* was also a human being. Was he or she also a human person?

14. Further problems arise in defining human beings and human persons in distinction from members of other species. Biologists and zoologists today indicate that the 'boundaries' between species are not as clear-cut and as well delineated as were formerly assumed or, indeed, as continue to be assumed by non-specialists. Life is currently viewed much more in terms of a continuum from one generation to another within species and, between species, as a spectrum with myriad variations of tone and shade than as a series of well defined and discreet entities each with a definite and distinct start and end point.

15. At this point it may be helpful to recall the limitations of reductionism. Breaking down 'life', be it human or animal, to its constituent parts leaves us with no absolute definitions of what it is to be a human being or a human person or with absolute means of distinguishing between species. At the same time, (as discussed further below), taking a more comprehensive approach, it is clear that human material, human beings and human persons exist. It is equally clear that animal material exists and that non sentient animals exist as well as animals with varying degrees of sentience. It is also equally clear that a dog is not a cow and that neither of them is human. To argue otherwise is to fail to see the wood for the trees.

A Descriptive Approach

16. This suggests that it may be advantageous to set to one side an approach that attempts to *define* the various terms that we have been examining in favour of an approach that seeks out to *describe* them. (We recognise that any relevant legislation or regulation will use the legal terminology of 'definition', but that is a distinctive and limited use of the term that may be applied to what we are referring to as 'description'.) Descriptions do not have to be perfect, exact or comprehensive in order to do what is required of them: to enable us to recognise what it is we are talking about. Crucially, in a manner similar to the moral spectrum mentioned above, descriptions begin with what may, by observation, be considered as normative. These descriptions may then be tested by the existence of non-normative cases which may, in turn, be typified as either non-normative but compliant with the description or anti-normative and hence non compliant with the description. Furthermore, descriptions are, by their nature, dynamic, focusing on what may be observed and interacted with rather than attempting to define the metaphysical or ontological. While metaphysical and ontological discussion has its place, a dynamic approach, particularly to personhood, obviates the need to engage in speculation that cannot be evidentially substantiated. This approach may not give us the whole picture, but it recognises that descriptions allow us to adopt a principled, yet pragmatic, approach suggesting that definitions may prove to be, in many cases, not only unattainable but also unnecessary.

17. With this in mind, it is possible to understand *human material* as material containing DNA that lies within the range so far identified in the human genome, accepting that further variation may naturally occur. It is unlikely that in a single generation such a natural variation or mutation will occur as to cause confusion with regard to whether or not the subject in question is human. Anything occurring

naturally, that has DNA outside this range is, therefore, to be viewed as animal material.

18. A *human being* may be (normatively) described as a biologically identifiable single human life: a human individual with a genetic constitution that lies with the range of the human genome. This description allows us to observe and to recognise an individual human being at whatever stage of development that being may have attained. Difference of opinion will remain as to whether or not the undifferentiated embryo is an identifiable individual, with the balance of opinion suggesting that this is not the case. Certain conjoined twins are non-normative but may be understood as one human being which, if developed sufficiently may become two human persons. These, if surgically separated, will remain two persons but will then also become two human beings. It is, of course, counter-intuitive to speak of conjoined twins in this way but it indicates that, for humans, the possession of personhood is the truly significant developmental attainment that best indicates who and what we really are. (Abigail and Brittany Hensel are examples of highly symmetric dicephalic parapagus conjoined twins that are clearly two persons sharing a single physical system: one being with one body and a single DNA but two individual persons.) A biologically identifiable single life, which does not have a genetic constitution that lies within the range of the human genome, is an animal.

19. As we have indicated above, a *human person* cannot be adequately defined but, taking a dynamic approach, he or she may be described, normatively, in terms of what we observe as emerging from a human being that possesses a cluster of characteristics normally associated with human adults. These characteristics will normatively include such things as intelligence, language, self-awareness, reflection and the capacity to form a worldview, the ability to enjoy relationships as well as the physical characteristics normally associated with the human body. The combined, observable, effects of these characteristics in a human being act as the identifiers of personhood. In a dynamic approach to personhood, these identifiers do not claim to define what a person is (a being made in the image of God, for example) but rather they enable us to recognise that a person is present, even though we may not be able to define quite what that person is. Babies, the comatose, those suffering from advanced dementia and anyone temporarily unconscious may be viewed as being non-normative but compliant with this description in that nascent or potential characteristics are justifiably believed to be present or that they were historically present and either have not completely disappeared or may reasonably be expected to return. Some people may not have all of these characteristics but it is not the presence or absence of any one of them that characterises a person but the combined effect (or potential effect) of the cluster of characteristics that is important. This implies a certain hierarchy of characteristics so that while the absence of a limb will have an undoubted effect on a person, it will not preclude him or her from being a person. Conversely, the permanent and irrevocable absence of any brain function other than those functions that keep circulation and respiration intact (should such a state be truly observable), clearly would have a major role to play in determining whether or not a human person was present at all.

20. Since our description of a human person is based on the normative experience of a human adult, in assessing whether or not a human being is a person we need also to

look at those identifiers that may be either absent or present that may be non-normative but compliant with the description and those that are anti-normative and hence non-compliant. An obvious example of an anti-normative characteristic for assessing human personhood would be the absence of a human being: an animal cannot be a human person! (This does, of course, leave open the question of whether or not an animal may be a non-human person.) In assessing whether a human being is a person the important indicators are those that are anti-normative. Non-normative characteristics such as low levels of intelligence or consciousness do not stop a human being from being a human person. Similarly, mental illness or personality disorders are non-normative but they do not render human beings non-persons. Human beings, even at the extremes of human experience, may enjoy self-awareness, reflection and an appreciation of and interaction with other humans, animals and the environment that cannot easily be understood merely in terms of complex reflex responses to external stimuli. Only such characteristics as complete and irrevocable lack of sentience (for example, some asymmetrical conjoined twins) may lead us to conclude that a particular human being is not a person.

21. When we come to view the possibility of animal personhood or, as some have described it, 'borderline personhood' the bar must be raised considerably. An animal with low levels of cognitive function ought not to be deemed to enjoy non-human personhood because animals with high levels of cognitive function are not afforded personhood. Most sentient, and all non-sentient, animals appear not to have a capacity for developed language, self-consciousness and reflection even though they may have the capacity to relate, to solve simple puzzles and to have some capacity for self-recognition. Experiments into animal consciousness have not rendered convincing evidence that even the 'higher' primates have sufficient attributes associated with personhood although some observers do believe that some of these primates ought to be viewed as 'border-line' persons or that changes in their neural function may render them so.

22. It has been necessary to engage in a discussion on what enables us to identify humans and animals before looking at 'definitions' of animals and animal embryos containing human material. Until we have established what is human and what is animal, as outlined above, it is not credible to think that we can say anything of substance about human-animal chimeras. In keeping with the approach that we have adopted so far, we shall seek to describe, rather than to define, the various chimeras that may emerge from current or prospective research.

Types of Animal-Human Chimeras

23. It is clear that human-animal chimeras have existed for some time and that some of these have become widely accepted not only within the scientific community but by society at large. Humans utilising pig heart valves and mice with human liver cells are but two such examples of the 'acceptable' end of the research spectrum. The medical and pharmaceutical benefits of these and similar interventions are plain to demonstrate and have been, generally, well received. Potentially, animals containing significant amounts of human neural material, or animal embryos containing significant amounts of human DNA and then being allowed to be born, lie at the other end of the spectrum. Before assessing the ethical implications of various types of animal-human chimera it is necessary to view the actual and potential types of

chimera that might be brought into existence and to attribute to them descriptive status. .

24. *Cytoplasmic hybrid embryos (admixed embryos)*: embryos created through cell nuclear replacement using animal ova. The DNA of these hybrid embryos is human with the exception of small amounts of mitochondrial animal DNA. The resulting embryo is human and ought to be treated as such. Currently these embryos may only be allowed to develop to the 14 day stage. This is beyond the point of differentiation but prior to the formation of the primitive streak. After differentiation, such embryos are human beings, though not human persons. It is unclear what effects the mitochondrial DNA might have on development if these embryos were allowed to develop further but the effects are likely to be greater than their volume percentage suggests. Theoretically such an embryo might be brought to full term. If such a (theoretical) event were to occur there is no guarantee that the resulting *being* would become a human *person* as the mitochondrial DNA may suppress human developmental features in favour of animal ones; alternatively, a human person may result or a 'border-line person' may ensue. If this being were to develop into a human person and she were to have offspring, the animal DNA would be transmitted to another generation and a new range for the human genome would be created.

25. *'True hybrids'*: embryos created by mixing animal and human gametes. These embryos cannot be understood as being either human or a specific animal, but are a mixture of both. As they are not currently permitted to develop beyond the 14 day stage, it is uncertain whether it would ever be possible for them to be brought to full term (or even to know what the gestation period would be). Such embryos, if they pass the differentiation stage of development would not be human beings but animals, albeit different animals from the animal gamete involved in their creation.

26. *Animal chimera embryos*: animal embryos into which human stem cells have been added at an early stage of their development. The stem cells transferred to the animal embryo may be differentiated or undifferentiated. The host embryo remains an animal embryo, albeit one containing human cells. If the embryo is allowed to develop and an animal is born it may be unclear whether or not the resulting animal is the same as the original host embryo or is a new animal. A mouse containing human liver cells, for example, is likely to be considered to still be a mouse, but if it contained human cells in most of its organs, it may be appropriate to consider it a new species, related to mice. If human neural cells were present which modified the mouse's language characteristics it is still likely to be viewed as a mouse. If, however, human mental characteristics developed to a significant degree, at some point the animal would not be a 'super-mouse' but a new kind of animal. The classification of an animal resulting from an animal chimera embryo would depend both on the amount of human material that developed in the resulting animal and on the effect of that material on the animal. Both quantity and quality considerations would have to be taken into account and while there can be no clear-cut point at which it may be determined that a new type of animal has been created, the judgement call would be made on the basis of how 'humanized' the animal has become.

27. *Animal/human embryo fusion*: the points that have been made with regard to animal chimera embryos apply also to animal/human embryo fusion.

28. *Transgenic animal embryos*: animal embryos which have human genes inserted into them during early development. The embryo remains an animal embryo with human genetic material added to it. The effects of this genetic material will depend on which particular genes, or sequence of genes, have been added. As with animal chimera embryos, the quantity of genetic material and the effects of that material combine to indicate whether or not the animal embryo will give rise to a resulting animal which is the same as the embryo or whether a new animal has been created.

29. *Foetal Transfer*: animal foetuses into which human genes or human tissue is transferred. In addition to the points made above, there is the potential for any transferred genetic material or human cells, unintentionally to affect the animal foetus' germ cells, resulting in genetic modifications being passed to subsequent generations should any resulting animal breed.

30. *Animal Transfer*: a young or adult animal into which human stem cells, genetic material or tissue is transferred. In addition to the points made above, animal welfare considerations must be taken into account.

31. In all of the above, it is clear that the distinctions that ought to be drawn are whether the resulting embryo, foetus or animal are the same as the original 'host', a variation of the original giving rise to a new animal or a variation that is so extensive that the resulting creature may develop characteristics indicative of personhood or borderline personhood. As argued above, the dividing lines between these categories are not discreet but are determined by a combination of the amount of human genetic material present and the humanizing effects of that material. In summary it is reasonable to argue that:

Classification

32. Animal embryos, foetuses and young/adults ought to be classified as the same, though modified, animals where the presence of human material may have significantly altered a discreet body system but has not had a significant impact on other body systems or on behaviour normally associated with the host animal.

33. Animal embryos, foetuses and young/adults ought to be classified as a different animal where the presence of human material has significantly altered more than one body system or has had a significant impact on other body systems or behaviour normally associated with the host animal.

34. Young/adult animals ought to be considered as borderline non-human persons when the presence of human material has resulted in them displaying additional characteristics normally associated with human persons but which fall notably short of the full range of behaviour normally associated with human persons. Where behaviour and characteristics approximate to that normally associated with human persons the host animal ought to be recognised as a non-human person.

35. In keeping with the approach taken in this paper these are descriptions, enabling identification, rather than definitions reflecting clearly established boundaries. In practice, decisions with regard to the kind and degree to which an animal embryo,

foetus or young/adult has been modified would have to be taken on a case by case basis and entrusted to an appointed panel.

Societal and ethical aspects of medical research involving the creation of animals that include significant amounts of human material

36. The arguments in favour of permitting wide-ranging research on animals containing human material centre on the recognition that much research has already been carried out and that this and other proposed research projects will bring benefits to humans (and possibly to some animals), particularly through advances in pharmacology and medicine. The arguments against broadening this research centre on safety and regulatory issues, philosophical and ethical concerns with regard to animal-human experimentation and animal welfare matters.

37. While recognising that safety and regulatory issues are important, these have been well recognised and addressed by most participants in research and by observers of the debate. While underscoring the need for stringent safety measures to be in place, particularly to avoid animal to human transmission of viruses and other diseases and while emphasising the need for close, competent and rigorous regulation, there is nothing distinctive that we wish to add to this area of the Academy's study. We intend, therefore to concentrate on philosophical and ethical issues as well as commenting briefly on animal welfare.

38. Five main areas of concern may be identified with regard to research on animals containing human material:

- (i) It is unnatural
- (ii) It will lead to moral or societal confusion
- (iii) It may give rise to borderline persons
- (iv) It is an affront to human dignity
- (v) It may lead to unethical treatment of animal-persons or borderline persons

It is unnatural

39. Advocates of continuing or expanding research rightly point out that, in principle, 'unnaturalness' does not provide grounds for prohibiting or curtailing research. Transplant surgery is 'unnatural', so too is flying in an aeroplane. Humans with pig heart valves are already, strictly speaking, chimeras, but there are few who would claim that the 'unnaturalness' of this should lead us to argue that such procedures ought to have been prohibited. Just because something is unnatural does not mean that it is ethically unacceptable or that it leads to societal rejection.

40. At the same time, suggestions that nature is irrelevant and that humans ought to be free to alter it without restriction, are fraught with difficulty. Our knowledge of genetics, even though it has advanced by leaps and bounds in recent years, is still incomplete. The fact that the 'natural order' does, indeed, demonstrate order in its biological consistency and balanced diversity, developed over millions of years, ought to give us pause for reflection. Even if no divine mind is seen as ordaining or directing this order, we ought to think carefully before brashly intervening in the established processes of nature, simply because we believe that we can do so. Where a divine mind is understood to be at work, as is the case amongst many millions of religious believers of different faiths, the case for restraint is made even stronger. As stated above, we are participants in nature; not disinterested third parties. We must take care not to act with adolescent enthusiasm and arrogance, uncertain of the effects of our actions, but carrying on regardless.

41. In this regard, the issue of unnaturalness is really a matter of degree. It may be useful to bear in mind, once again, the distinctions between the normative, non-normative and anti-normative. The question that ought to be asked is whether or not our intervention results in the creation of something that is anti-normative. To put it in an exaggerated and unrealistic way: a human with a pig's heart valve is not anti-normative, but a 'human' with a pig's brain would be. The argument that relies on demonstrating that unnaturalness is not, in and of itself, a barrier to research and experimentation fails to recognise that it is not the presence of unnaturalness but the degree of unnaturalness that is the issue.

It will lead to moral or societal confusion

42. Advocates of unrestricted research point out that, in the past, people have often been morally confused by advances in science, but that this confusion soon resolved itself. They will also point out that practices that society once found confusing or even unacceptable, may, after a while become unexceptional or even encouraged. The 'yuk' factor is a poor criterion on which to build policy. The whole discovery of genetics and the important role that genes play in human behaviour, at one time, seemed to have the potential to undermine belief in human autonomy and morality. Few believe this to be the case now, recognising that 'nurture and nature' both play important roles in shaping individuals who are able to take autonomous decisions and make moral judgements. Inter-racial marriages were once deemed to be unacceptable by the majority of people in the United Kingdom; happily such attitudes are no longer in the ascendancy.

43. Nonetheless, many people may be confused by the prospect of 'advanced' animal-human chimeras or they may react with repugnance at the idea. Uncertainty with regard to the moral status of such chimeras and the 'yuk' factor that some may feel, can act as brakes to acting without sufficient consideration. They can also act as warning indicators to the law of unforeseen consequences. Some actions may be wrong even though it is not possible to demonstrate their wrongness other than by asserting that they appear to be so intrinsically. The highly unusual incident, some years ago, of two men who made a 'cannibal pact', with one willingly dying on the understanding that the other would subsequently eat him, is a case in point. The man's death was suicide, not murder. The act of cannibalism was how he wished his

body to be disposed of. An intrinsic sense that cannibalism is morally and socially anti-normative (and, hence, wrong) and that this pact was immoral would be shared by most people but it is difficult convincingly to demonstrate precisely why it is wrong, using extrinsic arguments. In a similar way, an animal with a human mind seems to be intrinsically anti-normative even though it may be difficult to argue, extrinsically, that such a creation would be unethical.

It may give rise to borderline persons

44. The possibility that human neural cells or tissue might ‘elevate’ some primates to attaining borderline person status is not out of the question. Human neural cells have altered the language centres of mice; we simply do not and, perhaps, cannot know what effects human neural tissue may have if present in primates’ brains. The possibility that an animal person or borderline person may be created does not appear to be a problem for some advocates of unrestricted research. They simply argue that humans ought not to have a monopoly in personhood and if non-human persons were to emerge we ought not to be challenged by such an eventuality. After all, Neanderthals were almost certainly persons and co-existed with modern humans for thousands of years. Nature accommodated two types of person in the past; why not in the future?

45. There are obvious limitations to this argument. Both Neanderthals and modern humans were human. Neither of them became what they were by being ‘elevated’ from a previous state by the sudden transfer of genetic material from the other. Both were products of natural evolution; neither was ‘manufactured’. The sudden creation of a non-human person or borderline person, through human intervention, by manipulating an animal is quite different from the natural development of a species.

46. More importantly, such a creation would involve turning an animal into something other than what it is; the deliberate creation of a new type of being. Once again, this is a matter of degree: to enhance a mouse so that its language centre becomes more complex is quite different from a primate, already imbued with cognitive function, suddenly becoming a self-aware, reflective person. The latter is not enhancement or modification but a category shift, in effect, making the primate into something other than what it was; not merely non-normative but anti-normative.

It is an affront to human dignity

47. For those who believe that humans ought not to have a monopoly on personhood, there is no problem with the idea that non-human persons may be created. While there may be no philosophical or ethical difficulties associated with non-human persons in nature, if such were ever to be discovered, it is a different matter to create non-human persons by using human material to bring about such an occurrence. If a primate were to be discovered which truly demonstrated personhood, we would, presumably be surprised and then we would modify our view of the world to accommodate this remarkable discovery. Deliberately, to choose to create such a person by taking human material, the only means by which such a person may be created, and transplanting it into an animal is, in effect to place a human, or near-human, mind in an animal body. Once again, this is a matter of degree: a primate with a human liver will not compromise the nature of either primates or humans; a

primate with a mind that enables it to become a person because it is the recipient of human neural material, compromises both primates and humans. Human or human-like minds made possible because of the presence of human material ought to reside in human bodies; anything other than this is surely, anti-normative.

It may lead to unethical treatment of animal-persons or borderline persons

48. If a non-human person were to be created it would still be a person and, as such, ought to be treated with the same dignity and afforded the same rights as human persons. Such a being would not enjoy 'human' rights, but we would have to devise a new code of 'Person rights'. It would, of course, be unethical to experiment on such a person without its consent. It would also be wrong to 'own' it or to use it for a human person's benefit. Indeed, it could be cogently argued that to create a person for any reason other than for its own benefit is morally objectionable. While the decision to legalise 'saviour siblings' has breached this moral barrier to some extent, no one has seriously argued that such children ought not to have their own human rights fully protected. If a non-human person were to be created, its 'person rights' ought to be protected. If this were to happen, medical and scientific experimentation ought to stop; the reason, presumably for creating this person in the first place. There can, therefore, be no medical reason for creating such a person; just scientific curiosity and this cannot be sufficient reason for bringing such a being into existence.

Animal Welfare

49. Welfare considerations, with regard to animals containing human material, have been addressed above. While the ethics of animal research lie outside the brief of this study, there are particular issues that arise with regard to the possible use of primates in this type of research. Some primates, at least, demonstrate developed capacity for thought, feeling and relationship. While falling short of personhood, these characteristics, nonetheless, indicate that they ought to be afforded greater protection than non-sentient animals or sentient animals with lesser characteristics. Since primates' brains are closer to humans' brains than are the brains of other animals it may be believed that it would be instructive to experiment on them. To do so, however, would be to interfere with a creature that has a certain innate and recognisable ability for higher thought and emotion. Such an activity would be gravely questionable. Similarly, to transplant human material into such primates in a manner that would cause them pain or distress would be unethical.

Conclusions

50. From the above discussion, it is clear that we do not object, in principle, to research that involves animals containing human material. The main issue at stake is the degree of modification, particularly where the resulting animal becomes, in effect, a different animal or where characteristics typical of human personhood or borderline personhood may emerge. As we have stated above, it is not possible to define absolute standards by which these distinctions may be objectively measured but this does not imply that they do not exist. We believe that where there is any doubt, with regard to an animal's status, it is right to err on the side of caution. It is easier to live with an experiment that has not gone as far as it might than to live with the consequences of an experiment that has gone too far.

51. We recommend that:

- (i) Research involving animals containing human material ought to continue to be permitted, under regulation, subject to the following conditions:
- (ii) Cytoplasmic hybrid embryos and true hybrid embryos (as at present) ought not to be permitted to develop beyond the 14 day stage
- (iii) Research ought not to be permitted if it may result in an animal with significantly enhanced cognitive functions characteristic of human persons.
- (iv) Research ought not to be permitted if it may result in a live creature that, regardless of cognitive function, contains such a mixture of animal and human material that it is difficult to determine its status.
- (v) Research ought not to be permitted if it is likely to lead to the formation of human germ-lines in animals and if such an animal were to be created it must not be permitted to breed
- (vi) Research ought not to be permitted if it may give rise to an animal whose cognitive functions have been enhanced to the level where borderline personhood may be attributed to it, thus making it an unacceptable subject for experimentation
- (vii) Genetically modified animals ought not to be allowed to breed with one another or with non-modified animals other than in closed systems.
- (viii) Research ought not to be permitted that involves animal embryos or foetuses containing human material being implanted in a human womb.
- (ix) Research ought, no longer, to be permitted on born primates that may cause them pain, distress or significant loss of social interaction.
- (x) All research applications ought to be assessed by an independent regulatory body which will determine both the scientific merits of the proposal and its ethical acceptability before issuing a licence for research, outlining any conditions that may be imposed. If a research licence is granted, the project ought to be subject to ongoing safety and compliance monitoring by an independent regulator.

Brendan McCarthy 14th February 2010