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Does a Fish Need a Bicycle? Animals and Evolution in the Age of Biotechnology

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Animals, in the age of biotechnology, are the subjects of a myriad of scientific procedures, interventions, and modifications. They are created, altered, and experimented upon—often with highly beneficial outcomes for humans in terms of knowledge gained and applied, yet not without concern also for the effects upon the experimental subjects themselves: consideration of the use of animals in research remains an intensely debated topic.¹ Concerns for animal welfare in scientific research have, however, been primarily directed at harm to and suffering of animal subjects and their prevention. Little attention has been paid to the benefits research might potentially produce for animals themselves and the interests that some animals may therefore have in the furtherance of particular avenues of science.

Technological methods of animal modification, through genetic and environmental factors and more recently through the mixing of human and animal biological components, along with increasing contemporary interest in human enhancement have raised anew the question of animal enhancement. We should not, of course, forget that genetic modification of animals has been undertaken by humans for millennia, through domestication and selective breeding. But a shift in focus may be required, from the alteration or enhancement of animals for human purposes to interest in the ethics of enhancing animals for their own sake, that is in making the lives of animals better for the animals themselves.² To explore these possibilities, however, we must consider what would make animal lives better, what it is that animals might want or need.

Thus, our title question: “Does a fish need a bicycle?” This seemingly fanciful question, to which the (perhaps over-optimistic) relegation of men to the dustbin of history in the postfeminist millennium presupposes a response in the negative, may, when taken semiliterally in the context of animal enhancement, have a different—and potentially highly significant—answer. We would be unwise to assume that animals need technology “like a fish needs a bicycle” (that is to say, not at all); indeed, we may be unwise to assume, without proper and measured consideration, that a fish does not!

Amartya Sen has reminded us that “early Indian legal theorists talked disparagingly of what they called *matsyanyaya* ‘justice in the world of fish,’ where a big fish can freely devour a small fish. We are warned that avoiding *matsyanyaya* must be an essential part of justice,

Some of these thoughts were first condensed as evidence given by John Harris to the Deutscher Ethikrat (The German National Ethics Council), in Berlin, on February 25, 2010, and to The United Kingdom Academy of Medical Sciences Working Group on *Animals containing human material* 2010. A fuller treatise on related subjects will appear as Chan S, Harris J. Human animals and non-human persons. In: Beauchamp T, Frey R, eds. *The Oxford Handbook on Ethics and Animals*. Oxford: Oxford University Press (forthcoming).

and it is crucial to make sure that ‘justice for fish’ is not allowed to invade the world of human beings.”³ Just as justice for fish, crudely understood as a free for all in which the powerful simply do what they do, is rightly to be kept out of the world of human beings, many people seem to feel that the world of human beings must equally rigorously be kept out of the animal kingdom. Furthermore, why should “justice for fish” or indeed any consideration of what animals might deserve or be entitled to, ethically and morally speaking, be treated so differently from our considerations of ethics as applied to humans? The extent to which this mutual “exclusion zone” holds is ripe for reexamination.

In this paper we examine some of the animal-modifying technologies that have aroused contemporary ethical interest based on human-centered concerns and address them from the other side. In this way we can explore what animal concerns might tell us about our relationship with both other sentient creatures and indeed with the ecosystem as a whole. We consider in particular those technologies that involve a blurring of the perceived boundaries between humans and other animals, including the physical mixing of human and animal parts as well as other possibilities that might somehow make animals “more human” (or for that matter, humans “more animal”). In relation to these it becomes clear that not only are many of the human-centered concerns misplaced, particularly those seeking to preserve human–animal boundaries as a moral (and perhaps literally!) “rabbit-proof fence,”⁴ but that from animals’ points of view, it may be even more imperative that the fence be demolished.

Humanimals in Contemporary Debate

The mixing of human and animal parts is an issue of substantial theoretical and ethical interest. Thinking about it forces attention on what we mean by “human nature” and the theoretical and practical role that human nature plays in our understanding of ourselves and the world. Is our obsession with “human” this and “human” that—human rights, human nature, human dignity—illuminating or distracting? Such reflection also makes us think about our relations with animals and indeed the rest of the ecosystem, our evolutionary ancestry and what is sometimes called our posthuman future.⁵

The most likely scenarios consist of starting with a human individual (embryo or more mature organism) and adding animal bits (genes, cells, tissue, organs, etc.) or starting with an animal and adding human bits. In either case, the ethical issues, real and imagined, remain the same: species boundaries are breached—this, we believe, more of an imagined issue—and a new being, what we call a “humanimal,” may be created. It is in relation to this new being that the real ethical concerns come into play.

Before turning to consider these, however, it is worth addressing briefly the first issue regarding human–animal boundaries. We need to think always about the difference between what *will* cause ethical concern (or rather concern that people will label, perhaps unjustifiably, “ethical concern”) and what *should* cause ethical concern. Not all judgments about issues of ethical importance are ethical judgments.

It is difficult to see why humans should be denied beneficial changes (enhancements) solely on the grounds that they involve animal bits; it is difficult, also, to see why the research that

might lead to these beneficial changes should not be undertaken. One of the main things we have to understand is how problematic the separation of the categories animal and human are at the levels that will interest science for the foreseeable future. It is also important to convey an understanding that we current humans are human and animal combinations of a sort not dissimilar to those that might be created for science research or other purposes and that, therefore, the worries about human and animal mixing come, in one important sense, millions of years too late. And as one of the present authors has argued elsewhere,⁶ we humans are in fact “humanimals” with animal bits inherited in our genes, metabolized in our diet, and incorporated in many other ways. That, of course, does not mean it is irrational to resist further deliberate mixing, but rather shows that objections to, or even caution about, such mixing will have to be on the usual moral grounds (safety, welfare, flourishing, harm and benefit, etc.) and not based on a prejudice akin to racism.

On this point it is instructive to recall the words of the Academy of Medical Sciences in its report on inter-species embryos⁷:

8.3.1 Subversion of the animal-human species distinction

Some have argued that the creation of embryos combining human and non-human animal material is unacceptable because it subverts the animal-human species distinction and undermines human dignity and human rights ...

[W]e judge it unlikely that “human dignity”, a phrase used to emphasise special moral status and importance of human beings, derives simply from species membership. If the concept of “human dignity” has content, it is because there are factors of form, function or behaviour that confer such dignity or command respect.

Either hybrid creatures would also possess these factors or they would not. If they do possess these factors, they would also have a specific type of dignity analogous or identical to human dignity that other creatures lack; if not, they would not. Either way, the distinction between creatures that possess dignity and those that do not remains as it is now.⁸

The Academy report builds on this to recommend that the creation and development of human-animal transgenic, cytoplasmic hybrid, or transgenic embryos up to the existing 14-day limit for human embryos is ethically acceptable and should be permitted, but refrains from drawing a firm conclusion on creating full-fledged humanimal beings that will be brought to birth to become sentient and even self-aware. On the possibility of the further development of human embryos containing animal material, they emphasize that “[i]f such proposals are ever made, they will require deep and detailed consideration,”⁹ and on the subject of animals containing human components, they comment merely that “it will be necessary to consider the appropriate conceptual and regulatory framework for transgenic and chimeric animals that contain significant amounts of human genetic material.”¹⁰ From this it seems clear that although many human and animal mixes will cause concern, those that involve the creation of the following two categories of beings are, for good reasons, already widely accepted.

- 1) Human embryos that will not survive beyond 14 days

- 2) Animals that have human admixtures that have no chance of making the animal self-conscious as opposed to merely conscious, that is have no chance of making it a person and that do not cause suffering.

We may also add that if suffering to such animals will be involved it must (as in straightforward animal experimentation or in agriculture) be proportionate to the expected benefits for other animals or for humans.

Of course what proportionality requires in this case, of whom and for whose benefit, has to be determined in each case. For example, would it be unethical or disproportionate to cause animal suffering purely for human benefit? Would causing the same amount of animal suffering be justified if animal benefit were to result—and why? Having just argued that species boundaries should not of themselves present moral boundaries, any division of the moral community by species when it comes to assessing benefits and burdens would have to be justified and seen to be appropriate in particular cases. For example, the division of the human community into embryos, fetuses, children, adults, the incompetent, and those in a permanent vegetative state has utility in particular circumstances and often marks perceived differences in moral, political, and legal status. These alleged differences can be and indeed are often challenged in particular cases.

These knotty problems aside, however, it is the first two cases that we wish to reexamine. Why *should* either humanimal embryos developed beyond 14 days or humanimals that may become persons cause us concern?

Humanimal Suffering and Humanimal Persons

If, in creating humanimals, we are planning not on arresting development at the embryonic stage but allowing the resulting creature to develop into a mature individual, the key ethical issues seem to be the following:

- 1) Will the admixture of elements from different species be likely to prove beneficial or harmful to the resulting individual? Would it be a cruelty or a kindness to allow a creature like this (or as we expect a creature modified in this way to be) to grow to maturity? And are the expected benefits sufficient to compensate for the risks?
- 2) Are we prepared to accept the consequences? That is, are we as a society prepared to accept that if we “enhance” animals to the point at which they might count as persons, we should be prepared to accord them the rights and protections of interests, dignity, and status that go with personhood?

These questions also contain the essential ethical issues in animal enhancement that does not involve human admixture or human enhancement that does involve animal admixture. The general problems with human enhancement, as well as the concept of animal enhancement, the authors have discussed elsewhere.¹¹ In considering the possible benefits of animal enhancement, we might well start by bearing in mind that enhancement of animals to a condition (and hence a moral and political status) comparable to that of human persons is something that happens to (almost all) human animals. This process involves many

deliberate interventions to secure the desired outcome and many studious omissions as well, in addition to the thousands of natural shocks that flesh is heir to—all formative in their way. It is a conscious chosen process as well as being what some think of as a natural or instinctive one. It involves both gene expression and the usual expressions of delight and bemusement, as well as occasionally terror and revulsion, on the part of both developing human individuals and those with whom they interact.

What we refer to, of course, is that human individuals start (and remain at all stages up to and including that of neonate and probably beyond) as human nonpersons comparable in all essentials, save only that of their potentiality and genetic constitution, to animal nonpersons. Thereafter, through a combination of interaction with the environment, socialization, language acquisition, and education, they usually become enhanced to the point where they become “persons” properly so called. We do not usually balk at this form of animal enhancement; indeed, we would normally regard it as criminally negligent to fail to enhance such human animals to the point of personhood and beyond. If we reach a point at which we can be confident that animal enhancement, whether by human admixture or by other means in addition to those just described, is as safe and reliable as the normal development of human children, the potentiality of both humans and animals for personhood will be comparable in all relevant respects. At that point, we will need seriously to scrutinize the basis of our moral convictions and ask ourselves whether there are any convincing reasons based on more than blind “speciesism” to extend our obligations of care to human persons only.¹² Of course there are no obligations to actualize potential in any particular cases; if there were, we would be committed to an ethic of maximal procreation.¹³ We note the possibility of a symmetry between both humans and animals in their potentiality for personhood simply to illustrate the point that when the creation of animals with personhood is comparable with the creation of humans with personhood from the perspective of reliability and safety, then the ethics of both processes will be equally comparable.

An important concern in the case of enhancing animals or creating “humanimals,” then, is the ethics of increasing the likelihood for some creatures that they may qualify as persons. Assuming that there is no moral imperative simply to create more persons, to “multiply and disseminate the universe”¹⁴ as in attempts at human procreation, the ethics must turn on whether, *for the creatures in question* as well as any other morally relevant beings whose interests would be affected, enhancement to personhood will be a net benefit. Provided “humanimalizing” creatures is clearly in their interests, there should be no *prima facie* moral objection to doing so.

Because “big fleas have little fleas upon their backs to bite ‘em and little fleas have smaller fleas and so ad infinitum,” there may be loss to some creatures through gain to others. But this is also paradigmatically true of humans. This is not, of course, an argument in favor of animal enhancement, but simply a reminder that such a thing is not, of its nature, objectionable. Problems of justice and fairness will remain to be addressed whether humans, animals, or humanimals are the targets of enhancement.

Cruelty, Kindness, and (Hum)animal Welfare

Clearly, avoiding cruelty to humanimals or enhanced animals will be a primary concern, as it is in other forms of animal research. We should distinguish, however, between cruelty to humanimals once created and the possible cruelty of mere existence, that is, whether simply allowing such a being to exist or to grow to maturity would be in itself an unkindness. The latter possibility echoes the idea raised in relation to creating human persons of the “life not worth living”: can and would the creature’s life be filled with such intolerable suffering that existence itself would be a harm? This question does not permit of any easier answer in respect of humanimals than humans, but it bears noting that we usually plough ahead with human procreation regardless and attempt to alleviate any possible harms of existence retrospectively, by treating our human creations with as much kindness, consideration, and respect as we think they deserve.

If it is in the interests of a human being not to lose the qualities that make it human, particularly, say, high intelligence and self-consciousness, why might it not be in an animal’s interests to gain these things? How, specifically, would it not be in, say, a mouse’s interests (including its welfare interests) to gain these attributes?

Of course, one answer might be that we humans would make the humanimal’s life a misery if this happened or that other animals might do the same. These, however, are contingencies that may be preventable, not least by careful thought and action as to how such creatures might live and flourish.

Some have argued that the likelihood that we would fail to treat humanimal persons with the moral concern appropriate to their status constitutes grounds for preventing their creation.¹⁵ This, however, is flawed reasoning: we do not refrain from creating human persons for fear they will be treated without appropriate respect; instead we attempt as best we can to ensure that once created they *are* treated with respect. The same should apply to humanimals, as per condition (2) above: if we create humanimals who are also persons, we should be prepared to confer upon them the moral, legal, and political rights to which we consider human persons entitled.

There must, of course, be realistic, and not excessively restrictive, mechanisms for doing this. Needless to say, this is a big demand, and there may be no guarantees in advance of creating humanimals just what their reception might be. It might indeed be analogous to the reception for many generations accorded to the products of mixed race reproduction or even marriage outside clan or city. However, it is surely clear that what used to be called “miscegenation” should not have been prohibited or vilified on that account.¹⁶

Should we “put the brakes on” by holding back humanimal research until such time as we can be assured that the appropriate social and political environment is in place to treat these creatures commensurately with their moral status? The imposition of such a contingent moratorium might well, in the absence of pressure created by the impending existence of humanimals, turn into a permanent state of inaction. The likely scenario is, of course, that such creatures will begin to appear and we will have to try to find decent, fair, reasonable, and ethical ways of relating to them. This has been the pattern (not always happily) with

anomalous births and mutations, foreign visitors, immigrants, race mixes, and clones.¹⁷ The existence among us of Gods, demi-Gods, fairies, and other supernatural creatures has been, and still is, treated as a “reality” by many. More recently, persons born as a result of reproductive technologies have, to some, posed similar problems, and in the future we may expect humanimals, enhanced or posthumans, and synthetic life forms to become familiar and, we may hope, both accepted and acceptable.

Furthermore, unless, as discussed, their very existence would be an unkindness, although the first humanimals might face a struggle for recognition and equality, it would not be wrong to create them despite knowing the trials that might await (any more than it can be said to be wrong to have female or racial minority children in a world where sexual and racial equality are still very far from reality). Indeed, even in an impersonal judgment between World A, in which no humanimals ever exist to suffer (though countless humans and animals continue to suffer maltreatment), and World B, where through experiment and effort, moral consideration comes to transcend species boundaries and all creatures—human, animal, and humanimal alike—are accorded the moral recognition they deserve, World B is surely by far the better.

From Science to Supper: Challenging the Double Standard

From an animal welfare perspective we should also think about the question of how would it be worse for an animal to be made more human than for an animal to be given, say, Huntington’s disease or some other terrible human disease of the sort that is currently routinely licensed in animal research. A consistent and rational response might be to outlaw all such research, but in the context of a society like that of the United Kingdom and most European countries, that allows animal farming, meat production, and animal experimentation of any kind, there are hard questions to be asked and answered.

One such question is: why does science research with animals, so-called animal procedures research in the United Kingdom and elsewhere, adhere to rules more restrictive and strictly enforced than those imposed, for example, in food production, sports (such as horse racing and falconry), hunting, pest control, or food hygiene? Why are we accepting of the imposition of the so-called Three R’s (reduction, replacement, and refinement) aimed at minimizing and eventually eliminating all use of animals in science, when almost no policy measures suggest the same in farming and food production?¹⁸ Why does science, which by at least some accounts does immeasurably more good than meat eating, have to meet standards that are not imposed elsewhere?

Furthermore, scientific research may have the potential to bring considerable benefit to nonhuman animals, if we so choose to direct it—unlike human meat consumption, which only benefits animals in the sense that Christmas benefits the turkey!

And would this not lead to the abandonment of the so called Three R’s, because if we are consulting animal interests and not simply paying lip service to human convenience we should surely endorse the “Three M’s”: multiplication not reduction, multiplication not replacement, and multiplication not refinement?

Of course, multiplication, multiplication, and multiplication of humanimal persons on a large scale would have economic, population, and many other further ramifications that would have to be carefully thought through, would be unlikely to prove attractive, and would almost certainly become repugnant long before we had finished.¹⁹ We should bear in mind, however, that the present almost unbridled expansion of the human population is almost equally unattractive from many perspectives, although it meets equivalent conditions to those identified in 1 and 2 above.

Does a Fish *Really* Need a Bicycle?

Where, then, does this leave us with respect to the point from which we started? It may be, alas, that fish in their present form would not benefit from bicycles. However, fish and other animal species might well benefit from increased intelligence, the ability to adapt to new habitats, find new food supplies, and be better protected from diseases and other predators. If we reflect upon the moment in evolutionary history when some fish-like ancestor of ours used its limb-like lobed fins to crawl for the first time onto land, opening up a plethora of new habitats, food supplies, places to flee from predators, and an entire “brave new world” to colonize, we can see that although perhaps fish do not need bicycles, they might well benefit from legs, and having once acquired legs, the need for bicycles might not be so far behind!²⁰

What separates “us” humans from other animals is, on the one hand (as Ray Tallis has argued²¹), not just a handful of genes and a few million years of evolution but hundreds of thousands of years of human history and culture, yet on the other, simple opportunity on our part and simple lack of it, biological and social, on theirs. We do not hold ourselves morally separate from other humans whose cultural heritage and history may have diverged however much from ours: we offer them the opportunity to be recognized as persons and, indeed, where necessary, the opportunities required to *become* persons, that is to say a suitable social environment as well as any biological interventions that might be needed for the development of a human child to full-fledged personhood. We extend to them (albeit in a somewhat haphazard and not always just manner²²) the fruits of technological progress to enhance their lives. If science can likewise enhance the lives of nonhuman animals, then we have moral as well as prudential reasons to consider whether we should not offer them the same.

Notes

1. For a recent examination of this subject, see Nuffield Council on Bioethics. *The Ethics of Research Involving Animals*. Nuffield Council on Bioethics; London: 2005.
2. Chan S. Should we enhance animals? *Journal of Medical Ethics*. 2009; 35(11):678–83. [PubMed: 19880704]
3. Sen, A. *The Idea of Justice*. Penguin Books; London: 2010. p. 20
4. Australia’s “rabbit-proof fence” was constructed in the early 20th century as a way of keeping unwanted animals (rabbits) out of agricultural areas. It later appeared in the title of a book (Pilkington, D. *Follow the Rabbit-Proof Fence*. University of Queensland Press; Brisbane: 1996.) and film adaptation (*Rabbit-Proof, Fence*. Miramax Films. 2002.) about the “Stolen Generation” of Indigenous Australians, hence becoming a symbol of racial and ethnic discrimination.

5. Fukuyama, F. *Our Posthuman Future: Consequences of the Biotechnology Revolution*. 1st ed.. Farrar, Straus and Giroux; New York: 2002. Harris, J. *Enhancing Evolution: The Ethical Case for Making Better People*. Princeton University Press; Princeton, NJ: 2007.
6. Harris J. Taking the “human” out of human rights. *Cambridge Quarterly of Healthcare Ethics*. 2011; 20(1):9–20. [PubMed: 20167135]
7. *Inter-species embryos*, A report by The Academy of Medical Sciences. Academy of Medical Sciences; London: 2007. John Harris acknowledges his coauthorship of this report and thanks fellow members of The Academy Working Group for many useful insights; in particular he would like to remember Peter Lipton, with whom he worked on the sections of the report quoted above and whose tragic premature death has prevented us benefiting from what would have been an important contribution to this ongoing debate.
8. To give a nonhuman analogy, the existence of mules does not decrease or compromise the dignity of horses.
9. See note 7, *Inter-species embryos*, p. 29.
10. See note 7, *Inter-species embryos*, p. 40.
11. See note 3, Chan 2009:678–83; see note 5, Harris 2007; Harris, J. *Wonderwoman and Superman: The Ethics of Human Biotechnology*. Oxford University Press; Oxford: 1992. Chan S. Humanity 2.0? Enhancement, evolution and the possible futures of humanity. *EMBO Report*. 2008; 9(Suppl. 1):S70–4. Chan S, Harris J. In support of human enhancement. *Studies in Ethics, Law and Technology*. 2007; 1(1) Article10; available at: <http://www.bepress.com/selt/vol1/iss1/art10>.
12. See note 3, Chan 2009.
13. Harris, J. *The Value of Life*. Routledge & Kegan Paul; London: 1985. p. 7-27.
14. As declared abominable by one of the heresiarchs of Borges’ fictional world Uqbar, speaking of both mirrors and copulation! Borges, JL. *Labyrinths; Selected Stories & Other Writings*. Augmented ed.. New Directions Publishing Corp.; New York: 1964.
15. Streiffer R. At the edge of humanity: Human stem cells, chimeras and moral status. *Kennedy Institute of Ethics Journal*. 2005; 15(4):347–70. [PubMed: 16453949]
16. See note 7, Harris 2010:1-12.
17. We are thinking here of identical twins who are the most perfect clones in nature and occur remarkably frequently (1 in every 270 births, three per thousand births). See Harris, J. *On Cloning*. Routledge; London: 2004.
18. Zurlo J, Rudacille D, Goldberg AM. The three Rs: The way forward. *Environmental Health Perspectives*. 1996; 104(8):878–80. [PubMed: 8875163]
19. To the point of Derek Parfit’s “repugnant conclusion.” See his *Reasons and Persons*. Clarendon Press; Oxford: 1984.
20. It is important to note that we do not wish by this to imply that evolution is in any way a directed process, nor necessarily beneficial, except insofar as an increased chance of survival, with reproduction as the by-product that confers the selective advantage, constitutes a benefit. Survival, however, does undoubtedly constitute a benefit for some animals—not least humans, generally speaking!
21. Tallis, R. Darwinism Yes, Darwinitis No: Reaffirming Human Exceptionalism; Paper presented at “Humans and Other Animals: Challenging the Boundaries of Humanity,”; Institute of Philosophy, London. June 11-12, 2010;
22. See *The Manchester Manifesto*. [last accessed 1 Jan 2011] 2009. available at <http://www.isei.manchester.ac.uk/TheManchesterManifesto.pdf> Chan, S.; Harris, J.; Sulston, J. Ethical incentives for innovation. In: Stiglitz, J., et al., editors. *Intellectual Property Rights: Legal and Economic Challenges for Development*. forthcoming