

# Moral Transhumanism

*In its basic sense, the term “human” is a term of biological classification: an individual is human just in case it is a member of the species *Homo sapiens*. Its opposite is “nonhuman”: nonhuman animals being animals that belong to other species than *H. sapiens*. In another sense of human, its opposite is “inhuman,” that is cruel and heartless (cf. “humane” and “inhumane”); being human in this sense is having morally good qualities. This paper argues that biomedical research and therapy should make humans in the biological sense more human in the moral sense, even if they cease to be human in the biological sense. This serves valuable biomedical ends like the promotion of health and well-being, for if humans do not become more moral, civilization is threatened. It is unimportant that humans remain biologically human, since they do not have moral value in virtue of belonging to *H. sapiens*.*

**Keywords:** *biomedical ethics, enhancement, morality, transhumanism*

## I. THE SUPERFICIALITY OF SPECIES MEMBERSHIP

There have been numerous critiques of the claim that species membership confers moral significance (Singer, 1993; McMahan, 2002; Savulescu, 2009). One novel way of undermining the speciesist idea that human beings have a particularly high moral status in virtue of their membership of the biological species *Homo sapiens* is by way of showing that a concept of species that refers to the relation of organisms being members of the same species leads to a paradox. The importance of such an account will be that it casts doubt that

the claim species membership is an essential property of an organism that determines its nature and so, we will argue, is not a basis for moral status.

On the one hand, it seems plausible to think that the relation of belonging to the same species is *transitive*. Suppose that A, which may be an individual organism or a group of organisms, belongs to the same species as B, and B belongs to the same species as C. Then it seems to follow that A belongs to the same species as C. For if A belongs to the species S, so must B, since they are conspecifics. And, if B belongs to S so must C, because C belongs to the same species as B.

On the other hand, it seems that this relation cannot be transitive, since that would lead to far too many organisms belonging to the same species. Suppose we take it that interfertility, or capacity to reproduce and have a fertile offspring, is a sufficient condition of membership of the same species in the case of organisms that reproduce by sex. Then, if the Darwinian theory of evolution is right, and no form of organisms, from A to Z, which has developed in nature, had become extinct, transitivity would lead to the absurd conclusion that all organisms from A to Z would be members of the same species. This is because this theory holds that they have developed out of each other, and so there will be chains of interfertility linking A to Z, via linking A to B, B to C, and so on all the way to Z. Hence, given this criterion of species membership and transitivity, A and Z would belong to the same species, however dissimilar they may be. This is of course absurd.

A reason for taking all these organisms not to belong to the same species would be that they are not (directly) infertile with each other and that it is plausible to take interfertility to be not only a sufficient but also a necessary condition for sameness of species. We would then have a criterion of sameness of species for sexually reproductive organisms which stipulates that they belong to the same species if and only if there is interfertility between them or, in other words, if and only if they are capable of mating with each other and producing fertile offspring.

There are reasons for thinking that it is more contestable to claim that interfertility is a sufficient condition of sameness of species than that it is a necessary condition. For it might be maintained that an *accidental* interfertility between two sets of individuals would not be enough for membership of the same species. Imagine that on some planet in another galaxy, there happen to be organisms that are genetically so similar to human beings that they are infertile with them. Even so, it might be doubted that they would belong to the same species as humans, for it could be claimed that what is sufficient for sameness of species is interfertility only if it has arisen for the right evolutionary reasons, as the result of one population developing out of another, or their having common ancestors. For present purposes, we do not need to decide whether this is right, but could leave to the reader whether, in order to be sufficient for sameness of species, interfertility must have the right cause in the shape of a common evolutionary origin.<sup>1</sup>

The actual phenomenon of a *ring species* illustrates this quandary. Consider, for instance, the greater white-headed gulls whose range extends around the northern part of the globe. The herring gull (*Larus argentatus*) and the lesser black-backed gull (*Larus fuscus*), both found in Western Europe, qualify as distinct species, since they are not interfertile, and do not interbreed. They are also morphologically and phenotypically quite distinct. But, as we trace lesser black-backed gulls eastwards, along the Siberian coast to North America, they become more and more genotypically and phenotypically similar to herring gulls (Maynard Smith, 1975, 228–30). Now, if interfertility, with the requisite cause, is sufficient for sameness of species, each of these intermediate forms up to and including the end form would be linked by the relation of belonging to the same species. Consequently, if this relation is transitive, the end form must be lesser black-backed gulls. But this is counterintuitive. We could avoid this counterintuitive implication if we take it that interfertility is also necessary for sameness of species. This would allow us to claim that the end form belongs to a different species than the start form, that they are herring gulls rather than lesser black-backed gulls. But then, we are caught up in the paradox that some gulls both seem to be lesser black backed, in virtue of the seeming transitivity of species identity, while intuitively they seem not to be lesser black backed, but herring gulls.

We land in this paradox because, in seeming contrast to sameness of species, interfertility is *not* a transitive relation. It is a *non-transitive* relation (that should not be confused with it being *intransitive*); that is, even if A is interfertile with B, and B is interfertile with C, A and C could fail to be interfertile. This could be our reason for saying that the lesser black-backed gulls we start out with belong to a distinct species from the herring gulls we end up with, and we need such a reason because they are plainly distinct. But it is also this that creates the paradox, for if interfertility is non-transitive, how could it be a necessary condition for membership of the same species if that relation is transitive?

Contingent facts could cover up this tension, for it could as a matter of fact be the case that there is (direct) interfertility whenever there are chains of interfertility because intermediate kinds of organisms have become extinct. If B in our simple example had been missing, there would have been no pressure to regard A and C as belonging to the same species. But the occurrence of ring species shows that the contingent facts are not always like this; sometimes the intermediate links in between two populations that are not interfertile are still existent, and then the apparent transitivity of species identity presses us into paradox.

There is however a way of justifying abandonment of the paradox-generating transitivity of species membership: by giving up the *essentialist* idea that an organism could belong to one and only one species throughout its existence.<sup>2</sup> We must accept that an organism could belong to different species not only at different times of its existence but also *at the same time*. If

belonging to one species is compatible with belonging to another species, the difference between belonging to one species and belonging to the other cannot be very deep, so there is little reason to believe, say, that an organism cannot change from belonging to one species at one time to another at another time, perhaps by passing through a period in which it belongs to both.

If we give up species essentialism, we could explain how B could belong to the same species both as A and as C, though A and C belong to different species, S and S\*, by hypothesizing that B belongs to *both* species, to both S and S\*. We could not then appeal to transitivity to infer that A and C belong to the same species because B and C could both belong to S\*, while A and B both belong to S. If A had been extinct, but everything else would be the same, there would have been no reason to say that B belongs to more than one species, namely S\*. Similarly, if C had been extinct, there would have been no reason to say that B belongs to more than one species, namely S. But when both A and C exist, there is reason to hold that B belongs to both S and S\*. However, if this is so, we must give up the idea of species membership being an essential property of an organism that determines its nature. For B could clearly remain the same, regardless of whether A, C, both, or neither is present.

Let us now consider what consequences this anti-essentialist conclusion about species membership has for the speciesist idea that membership of the species *H. sapiens* could be a basis for human beings having a higher moral status or some other higher value than other biological organisms. Suppose that A is a population of human beings. Suppose again that B is interfertile with A and with C, some nonhuman species, but that A is not interfertile with C. Then, if we accept speciesism, the moral status of B becomes problematic. On the one hand, B ought to have the same high status as A, since B would belong to the same species as A, the human species. On the other hand, B ought not to have this high status, since it ought to have the same status as C which, through the failure of interfertility with A, does not belong to humankind and, so, does not have the high human moral status.

In reply, it might be suggested that B's status could be somewhere in between the status of A and C, because B is not only a member of the human species but also of another species; hence, B is not "purely" human. The status of C should be lower than that of B, since C is not interfertile with A, though it might not be so low as the status of organisms that are not interfertile with organisms that in their turn are interfertile with A. But this move of gradation undercuts the view that all humans have the same moral status because it concedes that there are some human beings, namely B, who lack the high status of other humans. Furthermore, just as there are genetic differences between, say, A and B, there will realistically be genetic differences *within* A (if A is a group of organisms). There will be individuals in A who are genetically more and less similar to the individuals in B. If so, it will be gratuitous to maintain that *all* individuals in A have the same status rather

than to maintain that those who have a stronger resemblance to B have a somewhat lower status than the rest.

Furthermore, we could imagine that the distribution of mental faculties in B (and C) was the same as that in A. We could imagine that the individuals in B are as capable of being self-conscious, of acting rationally and morally, of making scientific discoveries, of creating art, of participating in complex social enterprises, and so on, as are the individuals in A. We could also imagine that A and B are morphologically alike, so that in everyday circumstances they would be indistinguishable. Then it seems preposterous to deny that B has the same moral status as A. Imagine finding out, by means of a genetic test, that some of your friends or acquaintances do not belong to the human species. Surely, it would be unacceptable to propose that, therefore, they do not have the same moral status as human beings.

## II. SOME BASIC FEATURES OF HUMAN MORAL PSYCHOLOGY

So, our value is not plausibly based upon the fact that we are members of the human species. Furthermore, species membership is not an essential property of us. Therefore, we could lose our species membership without ceasing to exist. Such a loss of species membership would not represent any loss of value. Fear of this loss, then, should not prevent us from wanting to change radically. Sometimes humans who have been radically altered by technology are referred to as transhumans or, if the alteration is more extreme, posthumans. We should not fear a change to transhumans or posthumans even if we ceased to be members of the species *H. sapiens*.

We now want to argue that the most urgent change that should be made is a moral improvement of human nature. By human nature, we mean those biological and psychological dispositions to believe, feel, sense, think, act, and be that are typical of human beings. To give just one example, human beings tend to be social, existing in natural communities of about 150 (Hamilton et al. 2007; Dunbar 2008). Even if human beings were psychologically and morally fit for life in those natural conditions in which they have lived during most of the time that the human species has existed, humans have now so radically affected their conditions of living that they might be less psychologically and morally fit for life in these new conditions. These new conditions consist in societies with an enormous population density and an advanced science and technology, which enable their citizens to exercise an influence that extends all over the world and far into the future. If human beings do not better adapt psychologically and morally to these new conditions, human civilization could be threatened.

It is an obvious fact that it is easier for us to harm than to benefit, for example easier for us to kill than to save life, to wound individuals than to heal their wounds, and to rob individuals of their sustenance than to provide them with sustenance. Owing to this relative ease of causing harm, common

sense morality, which evolved to enable humans to live together in small groups, places more stress on not causing harm (within the group) than on doing good. This finds expression in the so-called *act-omission doctrine*, according to which it is harder morally to justify causing harm than letting harm occur. Such a principle also makes for a more practicable morality, which is not as demanding as a morality that requires us to relieve harm wherever we find it—which is almost everywhere.

The concept of responsibility involved in the act-omission doctrine is causal. Hence, it also implies that our individual responsibility is diluted when we cause something, for example environmental degradation, as members of a large group, as the causal contribution of each of us is then diminished as the size of the group that is responsible increases.

The tools at our disposal through most of our history enabled us to affect only our immediate environment during the imminent future. Moreover, the dangers found in the immediate spatiotemporal environment tended to be most urgent to deal with in order to survive and reproduce. In virtue of these two facts, we have been equipped with a *bias toward the near future*. It is this bias that manifests itself when we are relieved as something unpleasant due to happen to us in the immediate future is postponed and disappointed as something pleasant in store for us is postponed.

Human beings have altruistic dispositions, that is concern about the well-being of others for its own sake. However, this altruism is limited. The most uncontroversial kind of altruism, at least from an evolutionary point of view, is *kin altruism*, that is altruism as regards our children, parents, and siblings. Human beings are also capable of being altruistically disposed to non-kin with whom they are personally acquainted, lovers, friends, colleagues, and so on. However, there is an evolutionary reason why altruism does not extend indiscriminately to strangers: such an indiscriminate altruism would expose altruists to a too great risk of being exploited by free riders or to direct harm from out-groups. This might be one explanation of why *xenophobia* is a general characteristic of humanity.

From what we have said, it might be thought that a disposition to limited altruism risks being wiped out in the course of evolution, since it, too, is disadvantageous to the individual, exposing good-natured individuals to exploitation or other harm. But suppose that many of those who are benefited by altruists feel *gratitude*, which impels them to return favors done by altruists. If not only altruism but also this disposition to feel gratitude is widespread in a population, this population is likely to do better than populations in which these motivational traits are rare or nonexistent, in which there would be a tendency to exploit and harm each other, even within a group.

Thus, if we throw in something like a disposition to experience gratitude in the evolutionary mix, we have the beginnings of an explanation of why limited altruism, which is nonetheless more extensive than kin altruism,

could survive in a human population. This would be amplified if there is also a widespread disposition to react to ungrateful behavior with *anger* or *aggression*, that is with an emotion that issues in tendencies to punish those who do not return favors, exploit, or harm members of the group.

These emotions likely involve concepts of *desert* and of *justice*. For when we feel gratitude toward somebody, we take it that this individual deserves a good return and, so, that it is just that she have it; when we are angry at somebody, we see this individual as deserving to be punished or harmed in return and, so, that this treatment is just, etc. The strength of the sense of justice or fairness can be tested in so-called *ultimatum games*. In these games, there are two players, a proposer and a responder. The proposer proposes a certain division of some benefits. If the responder rejects the offer, neither the proposer nor the responder gets anything of the benefits. Human responders universally reject offers that would give them significantly less than an equal share, apparently because their feeling of being offended by an unfair division and their desire to punish other humans for their unfairness becomes stronger than their desire for a benefit.<sup>3</sup>

### III. IMPLICATIONS OF LIMITATIONS IN HUMAN MORAL PSYCHOLOGY IN A WORLD OF ADVANCED TECHNOLOGY

Armed with this rough sketch of some basic features of human moral psychology, let us now move onto the question of what problems such a psychology creates in the modern world.<sup>4</sup>

#### The Possibility of Intentional Misuse of Science

As we have remarked, it is generally much easier to harm than to benefit: virtually anyone could do serious harm, say, shoot a number of people dead in a minute, but almost nobody is ever capable of saving as many people in the same period of time. Psychopaths and sociopaths are not uncommon. They constitute 25% and 75% of prison populations. And then there are those who are delusional or fanatics, such as religious fanatics. One part of human nature is our tendency toward homicide and genocide. In ancestral times, one of the commonest causes of death was homicide as humans competed for scarce resources. Obviously, the greater ease of causing harm than doing good is magnified as our powers of action are increased by science and technology. This has happened because the expansion of scientific knowledge and technological prowess is putting in the hands of an increasing number of people weapons of mass destruction. In so far as this is so, this growth of knowledge will be instrumentally bad for humans on the whole, by seriously augmenting the risk that they shall die, or be seriously harmed, in a near future. For if an increasing percentage of us acquires the capacity to destroy an increasing number of us, it is enough if very few of us, or even a sole

agent, are malevolent or deranged enough to use this power for all of us to run a significantly greater risk of death and destruction.

Present technological know-how makes it possible for small groups, or even single individuals, to kill millions of human beings. Nuclear weapons are one well-known example, which have been feared since the 1950s. Dozens of countries have poorly secured stockpiles of enriched uranium. Some of this fissile material might fall into the possession of terrorist groups. To make a nuclear bomb out of such material seems not beyond the capacity of a well-organized terrorist group. If set off in a mega city, such a bomb could kill millions of people.

Another, even more frightful, threat is biological weapons. This threat is more fearsome for the reason that biological weapons are even easier to fabricate—indeed, a single individual could do so. Infectious diseases could spread extensively before they are discovered, especially if their incubation time is relatively long, such as a week or more. This is true of small pox, which kills one out of three infected and historically was the greatest single cause of human death. Biological weapons are probably harder to control and outlaw than nuclear weapons because they are the downside of research, which has the laudable aim of curing diseases.

Recently, scientists modified mousepox to make it lethal in 100% of mice. Mousepox is similar to human small pox, which was eradicated from the globe in the 1970s by vaccination. Genetic engineering of small pox could create a new strain with a mortality of 100% instead of 30%, and with a resistance against current vaccine. A small group of terrorists could fly around the world and deposit aerosolizers with fluids of this virus in airport terminals, shopping malls, indoor stadiums, etc. Within a few minutes, these aerosolizers could infect thousands of people at each location, most of whom would in their turn infect others, and so on. This scenario was depicted in the 1990s film *Twelve Monkeys*. Since the incubation period of small pox is 1–2 weeks, the disease would have spread widely before it was even detected, and even after detection there would be no effective way of preventing further dissemination. In *Twelve Monkeys*, nearly all the human population was obliterated by a single individual mounting such a bio-attack. It is not impossible that such a science fiction scenario could today become a reality.

### The Omission to Aid the Developing World

So far, we have considered how active human malevolence, in the form of psychopathy, psychosis, or ideology, could wreak destruction in a world of advanced technology. However, more passive aspects of our moral psychology can have other devastating consequences. Consider the widespread intuitive endorsement of the act-omission doctrine. The more wide ranging the active powers with which science and technology have provided us are, the greater our moral responsibility is. If we know that it is in our power to

prevent some harm, and we refrain from so doing, we are as responsible for its occurrence as we would be had we knowingly caused it. If this is right, people in affluent nations are heavily responsible for a lot of misery in developing countries, and behave morally wrongly in not abolishing it.<sup>5</sup>

The developed nations have to a large extent shirked their responsibilities with respect to the developing world. For instance, in 2008 only five countries had reached the modest goal that the United Nations set decades ago of providing aid amounting to 0.7% of a country's gross domestic product. The average for Organisation for Economic Cooperation and Development nations is 0.47%; the two biggest world economies, the US and Japan, lie at the bottom, at around 0.2%. One factor behind the weakness of the inclination to aid is the hold that the act-omission doctrine has on our minds. Another factor is just as probably our limited altruism.

But there is a further factor worth mentioning: the sheer *number* of subjects to whom we have to respond can present an obstacle to a proper response. While many of us are capable of vividly imagining the suffering of a single subject before our eyes and, consequently, feel strong compassion, we are unable vividly to imagine the suffering of hundreds, let alone thousands of subjects even if they are in sight. Nor could we feel a compassion that is 100 times (or more) as strong as the compassion we feel for a single sufferer. Rather, the degree of our felt compassion is likely to remain more or less constant when we switch from reflecting upon the suffering of a single subject to the suffering of hundreds of subjects.

#### Failures of Cooperation and the Environment

Our advanced technology has also created severe global problems, such as climate change and other environmental problems. And our evolved limited moral psychology is unlikely to adequately respond to these challenges. Some of the mechanisms in operation can be illustrated on a smaller scale by *the problem of the tragedy of the commons* (Hardin, 1968). Imagine a group of herdsmen who share a common pasture upon which their cattle graze. If the herdsmen let their cattle continue to graze these common pastures to the current extent, there will be overgrazing in the near future. So, the herdsmen will be able to feed fewer cattle, and they and their families will eventually starve. Suppose further that almost all of the herdsmen will have to effect a reduction if overgrazing is to be avoided.

Under these circumstances, it might not be rational for any individual herdsman to cut down on the grazing of his cattle. This will be rational only if he has good reason to believe that his signing up for a reduction is necessary for there to be a sufficient number of herdsmen who do so in order to prevent overgrazing. If this degree of cooperation appears unlikely, there is a strong self-interested reason to defect from a cooperative endeavor, since one would not then risk making a sacrifice that turns out to be useless.

As long as the number of herdsmen involved is small, the herdsmen are more likely to know each other personally and to have developed concern and trust for each other. Likewise, if their number is small, it will be easier for them to keep an eye on each other and detect free riders. For these reasons, the tragedy of the commons on a smaller scale presents a cooperation problem that is more tractable than environmental problems in the modern world. Environmental problems are caused by vast states with millions of citizens who are largely anonymous to each other and, so, have little reason to trust each other. The masses of people also make it easy for free riders to escape notice.

To make matters worse, when the number of agents involved is huge, the contribution of each agent to the total outcome might become *imperceptible*. Then an individual agent can have no altruistic and, *a fortiori*, no self-interested reason to contribute because there is no determinate threshold of contributions at which they become sufficient to produce a beneficial outcome for all. Furthermore, imperceptibility means that the prohibition of common sense morality against causing harm does not kick in.

What could make human beings cooperate in these circumstances is only a feeling of fairness that it would be unfair to those who contribute by cutting down on their consumption to free ride upon their sacrifices. Now we have found that human beings are equipped with such a feeling of fairness. But this feeling of fairness will be weaker when many of the other parties are anonymous. Moreover, as regards the environment, the sense of fairness is further undermined by the fact that those who make sacrifices will not be the ones to benefit from these: those who will benefit most from contemporary environmental-friendly policies are likely to be future generations, for environmental processes are in most cases slow working and take decades to make themselves felt.

This implies that the bias toward the near future comes into operation, making it even more difficult for us to impose upon ourselves the consumptive restraints necessary to save the environment. Moreover, the nations that per capita are the worst sinners as regards the emission of greenhouse gases—in particular the United States, which is responsible for one-fifth of the world's emission of carbon dioxide—will not be among those that will suffer most because of global warming. This will rather be coastal lowland, like Bangladesh, which risks being inundated when the sea level rises, and Africa which is threatened by desertification. Thus, our lack of concern for strangers will also come into play.

#### IV. MORAL ENHANCEMENT NECESSARY FOR A WAY OUT

It might be thought that the advance of science and technology itself provides the means of solving the problems that result from the mismatch between our primitive moral psychology and our current technological power.

For instance, it seems to equip states with more effective methods of surveillance of their citizens. Their intelligence agencies might be able to monitor all electromagnetic transmissions, phone calls, e-mail communication, etc. They could survey public places by closed-circuit television and record face-to-face conversations. To be sure, if the authorities employ these wide-ranging means of intelligence, they seem to set aside a right to privacy, which may be considered one of the characteristics of a liberal state, and turn it into something uncomfortably like the totalitarian state depicted in George Orwell's novel *Nineteen-Eighty-Four*. But the gain in security against terrorist attacks might be held to be worth this cost.

Similarly, it might be suggested that the progress of science will throw up clean energy technology or geoengineering solutions that will solve environmental problems without any restrictions on human consumption being necessary. But this way of thinking fails to take seriously the fact that, if we do not apply any brakes now, the problems are likely to be graver in the future, perhaps so much graver that the process of environmental deterioration will be irreversible. Furthermore, even if there will exist marvelous clean technology in the future, to substitute it for the dirty old technology will in all probability involve a burdensome period of transition—imagine, for instance, replacing all the billions of petrol-driven cars in the world with hydrogen fuel cell cars—that will make people in the future as tempted to delay action as we now are. A sobering thought for those who are inclined to believe in technological “fixes” of all the major problems facing humanity is supplied by the enormous global inequality and the omission of the affluent nations to give the developing nations more aid to reduce it. Here there are doubtless resources to come to terms with the problem; it is the moral will to use them to the full that has been lacking in the affluent nations.

Consequently, we believe that a moral improvement of humankind is requisite to solve the problems we have reviewed. All in all, it seems that the advance of science and technology has brought in its wake some most serious moral problems. The eminent British scientist Martin Rees estimates that “the odds are no better than fifty-fifty that our present civilization on the Earth will survive to the end of the present century” (Rees, 2003, 8). Such an estimate would have been wildly implausible for the centuries before the 1950s when nuclear weapons sufficient to blow up the Earth were amassed. It seems clear that advanced science has considerably increased the risk of worldwide catastrophes.

Against this background, it seems reasonable to believe that further scientific progress may aggravate rather than mitigate the predicament of humanity. We believe that a heightened moral sensitivity is necessary to reverse this descent of humanity down a spiral of ever-increasing existential risks. Such a heightening of moral sensitivity seems possible in principle. There is a strong tendency in human nature toward conformism. When they grow up, children do not merely acquire knowledge of the cultural traditions of their

society, its language, religion, morality, and so on; most of them readily adopt these cultural traditions and regard them as superior to alternatives. Societies have always taken advantage of this malleability of the human mind to imprint moral norms conducive to their survival and prosperity, for example norms such as that it is wrong to kill innocent members of society against their will, to steal their property, and so on. Most citizens abide by laws to this effect without the need of sanctions.

In the world of today, when scientific progress has vastly increased our powers of action, and connected societies all over the world with each other by means of travel and commerce, such intra-societal norms are not far-reaching enough. Societies need to inculcate in their citizens norms that are conducive to the survival and prosperity of a world community of which these societies are parts. To some extent, contemporary democracies have responded to this demand by propagating the doctrine of equal worth of all human beings. This is a major step forward in comparison to the racism and sexism that were still prevalent in a not very distant past. But it seems clear that this egalitarian ideology is a long way from having sunk so deeply into us that it has significantly extended our limited altruism. We have noted the tremendous global inequality; a case can be made for saying that this inequality is increasing rather than decreasing, despite the egalitarian ideology. For instance, the difference between the per capita incomes of the richest and poorest countries has steadily increased since the beginning of the 19th century (Seitz, 2008, 3).

Traditional means of moral education might then not be effective enough. This makes it worthwhile to explore the possibility of biomedical means of moral enhancement, to change our nature. It seems to us likely that such means could be made available by further research, since moral dispositions have biological and genetic bases. To mention some findings that support this hypothesis: the sense of fairness, as tested by ultimatum games, appears to have a strong genetic basis, as is evidenced by the fact that identical twins, who have been separately brought up, exhibit similar responses in these games; the neurotransmitter serotonin appears to suppress aggressive behavior; and oxytocin, which facilitates birth and breastfeeding, also appears to mediate maternal care, pair bonding, trust, and other forms of pro-social behavior (Persson and Savulescu, 2008).

To be sure, such findings are a long way from yielding effective biomedical techniques of moral enhancement. Yet our moral dispositions are in large part biological, capable of biological understanding and manipulation. We think that the enormity of the moral problems that face us makes it reasonable to explore the possibility of such techniques, though their discovery may turn out to lie too far into the future for such techniques to offer any realistic hope of helping us with the overwhelming moral problems that we have reviewed. Biomedical moral enhancement, were it feasible, would be the most important biomedical enhancement. Without moral enhancement,

other techniques of biomedical enhancement seem likely to increase global injustice. For instance, if any techniques of life extension are discovered, they will probably be employed to further extend the lives of people in the most developed countries, though their lives are already on average almost twice as long as the lives of people in the poorest countries.

However, it must not be overlooked that biomedical techniques of moral enhancement raise the same moral problem as all technological innovations: that of a proper application of them. In the case of techniques of moral enhancement, this takes the form of a bootstrapping problem: it is human beings, who need to be morally enhanced, who have to make a morally wise use of these techniques. Thus, the discovery of such techniques offers no foolproof way out of the danger zone into which humankind plunges deeper and deeper.

We started out by distinguishing between a biological and a moral sense of “human.” We have contended that, if human civilization is to avoid destruction or deterioration, human beings need to become more human in the moral sense. Such morally enhanced humans may be called transhumans or posthumans. We do not see that, if this change has to be brought about partly by biomedical means, this would necessarily result in beings that are no longer human in the biological sense. But even if that were to be the outcome, this would be of no significance, since species membership is unimportant.<sup>6</sup>

The exponential growth of advanced technology makes our lives much better or it may afford the means of our destruction. Things might get very much worse than they are today. The embracement of transhumanism and posthumanism offers one potential means of addressing this. And we have no reason to regret changes that would make us nonhuman in a biological sense. There is nothing special or valuable about human beings in the biological sense. To be more “human” in the normative sense of the term, in terms of those capacities that afford members of our species moral status and value, may require an evolution to posthumanism.

## NOTES

1. Strictly speaking, however, it would then be *a degree of genetic similarity*, which is necessary for interfertility in sexually reproductive organisms that should have the right cause. The reason is that this would take care of the complication of infertile individuals, as well as provide an indication as to how the criterion of species identity could be generalized to cover organisms that reproduce asexually.

2. For a proponent of this essentialism, see Ayers (1991, 87). This claim is crucial for Ayers, since he adopts the so-called animalist or biological view of our identity, according to which we are identical to human animals.

3. For further discussion and references, see Persson and Savulescu (2008).

4. For a fuller discussion of the problems reviewed below, see Persson and Savulescu (2011, forthcoming).

5. This has been forcefully argued by for example Singer (1993, chap. 8) and Unger (1996).

6. Many thanks to an anonymous referee for valuable comments.

## REFERENCES

- Ayers, M. 1991. *Locke* vol. 2. London: Routledge.
- Dunbar, R. 2008. Mind the gap: or why humans aren't just great apes. *Proceedings of the British Academy* 154:403–23.
- Hamilton, M. J., B. T. Milne, R. S. Walker, O. Burger, and J. H. Brown. 2007. The complex structure of hunter-gatherer social networks. *Proceedings of the Royal Society B* 274(1622):2195–203.
- Hardin, G. 1968. The tragedy of the commons. *Science* 162:1243–8.
- Maynard Smith, J. 1975. *The theory of evolution*. Harmondsworth: Penguin.
- McMahan, J. 2002. *The ethics of killing—problems at the margins of life*. Oxford: Oxford University Press.
- Persson, I., and Savulescu, J. 2008. The perils of cognitive enhancement and the urgent imperative to enhance the moral character of humanity. *Journal of Applied Philosophy* 25:162–77.
- . 2011. Unfit for the future? Human nature, scientific progress, and the need for moral enhancement. In *Enhancing human capabilities* (pp. 480–500), ed. J. Savulescu, R. ter Meulen, and G. Kahane. Oxford: Wiley-Blackwell.
- Rees, M. 2003. *Our final century*. London: William Heinemann.
- Savulescu, J. 2009. The human prejudice and the moral status of enhanced beings. In *Human enhancement* (pp. 211–50), ed. J. Savulescu, and N. Bostrom. Oxford: Oxford University Press.
- Seitz, J. L. 2008. *Global issues*, 3rd ed. Oxford: Blackwell.
- Singer, P. 1993. *Practical ethics*. Cambridge: Cambridge University Press.
- Unger, P. 1996. *Living high and letting die*. New York: Oxford University Press.

DR. RUPNATHJI (DR. RUPAK NATH)