CHAPTER 4

The Ethics Of Enhancement

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As well as seeking *longer* lives we also seek *better* lives. Indeed living longer in the absence of good life quality would be a largely pointless pursuit—a point developed powerfully by Aldous Huxley in his dystopian allegory *After Many a Summer*. [1] As well as exploring ethical issues in *life extension* it is therefore of interest to explore ethical issues in *life enhancement*.

Recent advances in enhancement therapies based on psychoactive drugs, genetic engineering and brain prostheses have stimulated much debate amongst bioethicists. [2] This debate is complicated by ambiguities in the term "enhancement" and an associated vagueness in the therapy-enhancement distinction. The emerging ethical questions include concerns about fairness, equity, the realization of excellence and the importance of the means of its achievement. There is also disquiet about the possibility of an attenuation of the concept of the self, and a degradation of human dignity and respect. In addition, there are worries about the use of mechanistic cures or palliatives for complex problems of mind and brain, and the dangers posed by Promethean aspirations. There is also a more general concern that the use of neuro-enhancing drugs will be a forerunner of brain enhancement based on genetic engineering, and a danger that this may soften us up for a regimented "post-human" future, reminiscent of another of Huxley's powerful dystopian visions, set out in *Brave New World*. [3] Debate on these issues concerns not only present

but also the potential use of therapeutic and brain enhancing agents.

In this paper we address the nature of enhancement and the problem of the therapy-enhancement distinction, and then critically review some of the arguments that deal with moral concerns arising from an application of these mind affecting interventions. We also explore whether there are separate ethical consideration concerning enhancement with psychoactive drugs and enhancement using genetic engineering. We consider also the possibility that the use of pharmacological enhancements may camouflage the risks posed by genetic change.

From psychoactive drugs to genetic engineering: a slippery slope?

Some bioethicists suggest that the use of psychoactive drugs is a step towards the general acceptance of neuro-genetic engineering, and that these procedures, by eroding human dignity and degrading human nature, could pave the way towards a disturbing "post-human" future. [4] Acceptance of a seemingly benign mind-affecting technology, it is suggested, might soften us up for more dangerous enhancement techniques which might be introduced later.

These concerns may however be alarmist. There are a number of reasons, in particular in connection with continuing advances in drug development, which will probably prevent such a situation from developing. For example, in the future psychoactive drugs may be tailored in their pharmacological effect and their dose may be adjusted to an individual's genetically determined response profile, thus having greater efficacy with fewer side effects. [5] Better-targeted psychoactive drugs administered under medical supervision may provide many of the benefits

promised by genetic interventions, and it may be that these benefits can be provided sooner, more flexibly, more cheaply, more rapidly and reversibly, thereby obviating the need for genetic modification.

Brain enhancing drugs (to be considered below) generally operate by transiently increasing neurotransmitter levels in nerve synapses (that is, in the gaps separating neurons), thereby modulating or increasing neural activity and the formation of new synaptic connections. These changes may produce calming, mood brightening, wakefulness and learning and memory effects. By contrast, genetic engineering techniques—if applied to somatic and, more controversially, to germ cells—pose substantial ethical challenges that go beyond the use of psychoactive drugs.

Genetic changes may irreversibly program brain cells to produce altered or novel molecules or structures, or create switches that amplify or modulate behavioural dispositions. Moreover if germ cells are modified, there is the possibility that these changes may be passed on to offspring who had no part in making decisions that directly affect them. Altered gene sequences in reproductive cells may also give rise to unintended, and possibly long delayed, consequences to individuals resulting from the reshuffling of genes which occurs during reproduction.

For most people the concern about the transition from drugs to genetically engineered brain enhancement has little relevance. It is unlikely that many individuals will be able to obtain these psychoactive agents, let alone the foreshadowed genetic treatments. Most people are protected by their poverty from the harms—as well from the possible benefits—that these technologies present. [6]

We suggest that discussion of the ethics of the two types of intervention should be carefully distinguished, because although they share the common feature of brain enhancement, there are significant differences between the methods. Consequently, even in countries afflicted with the ills of affluence the argument about a "softening up" process, or an inexorable progression from one sort of enhancement to the next, is far from obvious. These technologies are, to a large degree, independent and the different methods of enhancement they embody need to be considered on their merits.

Enhancement, enhancers and moral considerations

A broad definition of cognitive enhancement refers to any chemical, electronic or procedural interventions that may increase or improve cognitive performance beyond the normal or average range. The definition of "normal" however is problematic and must take into account cultural factors, such as age, sex and ethnicity.

Some discussions of this topic employ a very broad definition of enhancement, including, for example, the use of prostheses, IVF treatment, insulin, glasses, artificial hips, telephones, private schools and coaching colleges. [7] Such a broad definition generates confusion by grouping together "enhancements" which are altogether different in function, location and effect. A hip replacement has no direct effect on brain function—apart from pain reduction and the benefit of increased exercise on brain circulation—and schools and coaching colleges enhance the brain through learning and memory formation that utilise time-honoured and uncontroversial methods. However even if discussion is limited to direct brain enhancements, there is still plenty of room for confusion because of the many unrelated ways the

brain and mind may be enhanced, and the different effects produced by these interventions.

There is a perfectly natural type of brain enhancement which occurs as the brain grows in complexity in response to a complex and rich environment. This process evolved over eons through "niche construction" through which humanity has influenced its own natural selection and thereby the evolution of succeeding generations. In this way, a dynamic, self-reinforcing process of enhancement has generated ever greater individual and social complexity, through multi-layered processes involving genes, the brain, environment and culture. [8]

These dynamic developments are part of a continuing process of gradual and incremental (if unintended) neuro-enhancement. In addition, with increasing knowledge and technological advances, humanity has discovered (or invented) methods such as meditation, and deployed a number of psychoactive substances that range from the innocuous to the dangerous and addictive—legal and illegal. [9] These agents modulate and affect cognitive performance and thereby increase relaxation, tranquillity, wakefulness, euphoria, stamina, pleasure, feelings of well-being, happiness or physical performance, as well as reducing pain, fear and inhibitions. Such psychoactive agents were (and are still) also used in rituals which purport to communicate with spirits, gods, or ancestors. [10]

Most cultures make use of at least some of the mind-affecting substances listed above in patterns of usage which are often related to social advantage. This raises ethical questions however which are not much considered in the literature dealing with the "new" psychoactive drugs. Instead the authors typically focus on gene changing recombinant DNA technology, and newly developed psychoactive

drugs. [11] Any concerns about threats to human dignity or human nature are projected into the future, thereby suggesting that our present situation is unproblematic.

It is not clear why the—socially and individually—damaging and costly neuro-enhancing agents like alcohol, nicotine, or heroin should be excluded from the discussion. These agents may have a greater potential for addiction and for more serious physical and psychological damage than, for example, selective serotonin reuptake inhibitors (SSRIs) such as Prozac or stimulants such as Ritalin, which certainly affect mood, character and consciousness. If rationality and autonomy contribute to our sense of self and self-worth, thereby contributing to our worthiness of respect, then insofar as new psychoactive drugs represent a threat to these constituents of our humanity, they thereby constitute a threat to human well-being. In order to understand the nature of the threat posed by these new drugs, it is important to understand how and where they act. [12]

Many of the psychoactive drugs now in use became available during the last four to five decades. Earlier versions of these antidepressant and antipsychotic drugs—such as Lithium, the Tricyclics or Monoamide Oxidase Inhibitors (MAOIs)—had too many side effects, or few enhancing effects over and above therapeutic effects, for them to have been used regularly for the enhancement of "normal" individuals.

The new psychoactive drugs were serendipitously discovered to have a specific therapeutic effect, usually that of increasing the levels of neurotransmitters in the synapses and synapse formation. [13] Elevated levels of specific neurotransmitters can have mood brightening, relaxing and calming effects, as well as affecting the formation, modification, retention and retrieval of memory. [14]

Depression and anxiety seem to be related to synaptic levels of serotonin, dopamine, acetylcholine or norepinphrine in circuits used for learning and memory. [15] Throughout life traits and memory can be added to, modified or lost through a continuing process of learning, memory formation and forgetting.

Psychoactive drugs such as Prozac or Ritalin increase and rebalance neurotransmitter levels and thereby increase nerve activity and synaptic formation. These drugs modulate neuron circuits that store memory, make us feel depressed, happy, anxious or relaxed, and thus modify factors which are products of our genetic traits as well as of our learning and experience.

Therapy and enhancement users

There are three overlapping groups in society seeking therapy or enhancement with psychoactive drugs. First there are the seriously impaired who are clearly in need of therapy, and whose lives may be a misery perhaps to the point of being suicidal. Such individuals are unable to function normally or productively in society or in school and college. There is no question that this group may be helped greatly by psychoactive drugs and that any costs to society or to themselves posed by possible side effects are outweighed by the gains of the treatment. This group clearly stands to gain from existing and yet to be developed psychoactive drugs.

There is a second group of mildly afflicted individuals who may suffer from mild depression, melancholy, stress, fear, anxiety, sadness, underperformance, disappointment or unhappiness. Also included in this group are children and adolescents whose behaviour may be boisterous or unfocussed. Some may believe that they have personality

traits, perhaps a result of early psychological trauma, which they are not comfortable with, despite the fact that they may seem to function normally in society, and who consequently believe they might benefit from drugs like Prozac [16] or Ritalin [17] . There is often disagreement about whether these individuals deserve pharmacological treatment or whether they are in a predicament from which they should be able to extricate themselves, perhaps with the help of counselling and life style changes.

The third group consists of more or less normal individuals—though there is no sharp boundary which separates members of this group from the second—who seek a quick fix to their problems (and who may not want to exert themselves), as well as those with an eye to any easy advantage and who seek to learn faster, remember more, and stay calm and alert in exams, or in public performances. These individuals want to perform better, have more intense experience and perhaps smooth out life's cycles of unhappiness and happiness. The use of psychoactive drugs by this group purely for enhancement, or for the treatment of mild conditions, may be a cause for concern quite apart from medical side effects and possible psychological harm. This category of users raises questions about distributive justice, equity and fairness, as well as more profound ethical questions about our shared humanity. Is the non-therapeutic use of psychoactive drugs for enhancement justified in these cases? There are important differences between the use of psychoactive drugs for enhancement—to change mental capacity, personality, consciousness, or memory—and therapeutic uses of these agents.

Therapy versus enhancement

Therapeutic use includes treatments that remedy illness, deficiencies and disorders or restore function to a normal

range. This use falls within the traditional domain of medicine. It includes treatment of conditions that are typically covered through national health schemes or private health insurance. Scarce health dollars tend to be restricted to treatments characterised as therapy, normally corrective procedures based on medical need, and often excludes various elective procedures.

An *enhancement* is a treatment that aims to extend function or performance beyond the natural, average or normal range. Its aim is to improve physical or psychological—and in some cases social—abilities, behaviours, functions or capacities. The "snorting" of crushed Ritalin—which at higher concentrations has similar effects to methamphetamine—is an example of psychoactive drug use for the purpose of psychological enhancement. A student suffering mild depression who takes SSRIs, and as a result becomes more focussed and relaxed, perhaps performing better during examinations, would be harder to categorise and perhaps may be considered to have received both therapy and enhancement.

The therapy-enhancement distinction fails to provide a clear boundary between acceptable and non-acceptable uses of psychoactive agents, and indeed other biotechnologies that are currently developing. In many situations "normality", or what has been described as species-normal function, may not exist, or be subject to change in a way that makes it unhelpful or meaningless as a goal of treatment. Therapy and enhancement are not mutually exclusive and the therapy-enhancement distinction is therefore unhelpful for differentiating between acceptable and non-acceptable uses of psychoactive agents.

The therapy-enhancement distinction is further complicated also because of the plasticity and

responsiveness of the brain and the often elastic criteria used in diagnosis. Research indicates that various types of brain/mind disorders can be accompanied by a different shape, volume or level of activity of certain brain regions compared to the normal, or by differences in observed brain metabolism. [18] Once these disorders are better understood, we may be better able to make this distinction.

Elastic definitions of health, for example that of the United States National Institute of Health: "if a condition causes unhappiness, psychological pain and social disadvantage then it represents a disease and interventions to remedy it should be considered cures", [19] or that of the World Health Organisation: "health is a state of complete physical, mental and social wellbeing", [20] provide generous interpretations that will not be welcomed by those responsible for health budgets, and would include most of the individuals classified above in group two as eligible for therapy.

In practice, the vagueness and elasticity of the therapy-enhancement distinction means that it often comes down to what a medical practitioner says it is. The relationship then depends on the medical practitioner's responsiveness to "life or wellness" problems, and their perceptions of hypochondria or deception. Are they willing to consider examination nervousness, restlessness, mild depression, anxiety, fear, mild memory loss, lack of assertiveness, shyness, or work stress a problem worth treating? And are they willing—or do they have time?—to listen to and offer help to the distraught parent with the hyperactive child?

Ethical concerns

Ethical concerns about the use of psychoactive agents focus on questions of fairness and equity, the importance of

means (natural and authentic versus artificial and furtive) in attaining a goal, and whether acceptance of such means might diminish standards and degrade social values. However the social consensus against the use of enhancing agents in competitive sport has not (yet) developed in the domain of cognitive endeavour. There are also concerns about the legitimacy of offering palliative cures for complex problems involving the mind, the self and free will, and worries about the erosion of human dignity and respect—vital human values. In addition there are less sharply focused concerns about the hubris of Promethean aspirations associated with more ambitious life-enhancing proposals—including the transhumanist proposal for radical longevity enhancement. An ethical evaluation of these issues might reasonably begin by considering the general (and familiar) bioethical principles of beneficence, nonmaleficence, respect for persons, and justice. [21]

The use of psychoactive drugs raises questions of fairness and equity that are poignant and subtle. A wealthy family providing their children with access to current (or future) enhancers will be adding a further dimension to existing social advantage—which may include already a privileged, stable and rich environment, attendance at well-resourced schools and colleges, and the opportunity to forge the right social connections for a successful future professional or business career. Subsequently, social and peer pressure might pressure more and more people to use enhancers, and the increase in the use of enhancers will inevitably diminish their advantage to users, while increasing the disadvantage for less privileged non-users while shifting the 'normal range' of the bell curve in the direction of improved performance. This will create a new 'normal' or 'average' for that endeavour, thereby redefining standards of normality.

There is a deeply ingrained expectation in society—aligned perhaps with the protestant work ethic—that people should work hard for what they obtain and that valuable lessons of life are learned through perseverance, discipline, hardship failure, and hard-won success. Although taking an occasional psychoactive drug to overcome shyness, or to stay calm in an important examination may seem acceptable, using drugs to win a game of bridge or for better sports performance seems questionable.

Parens talks of the importance of *means* in achieving an outcome. [22] He contrasts a situation where a child is given Ritalin to be quiet and pay attention, with a child that is taught to sit quietly and to follow a lesson. In the latter case the child has worked, made an effort and might be proud of its achievement. For the child on Ritalin taking the drug has diminished the experience; it has learned that one strategy for meeting the challenges of life is popping pills. The child might apply this approach to other problems on to adult life. Similarly the use of enhancers threatens our conception of excellence, when through hard work together with giftedness or creativity excellent works are produced. The use of enhancers diminishes the merit of the achievement of the outstanding craftsman, sports person, student, artist or professional. [23]

Root Wolpe points out that the argument that if normal attention or cognition is good then increased attention or cognition is better, has surprising consequences. [24] The brain processes information, provides emotional content and filters information inputs and memory outputs. A memory enhancer would need to be discerning. For example, one would not normally wish to remember the details of staring for one hour at the advertising in a bus shelter or be too burdened by memories of horrifying accidents or violent

films. In performing this filtering and winnowing the brain ensures that learning and accessing memory becomes manageable and that emotional highs and lows do not become disabling. [25]

Carl Elliott asks rhetorically: "spiritual emptiness the search for self, alienation in the midst of abundance: are there traits any more American than these?" [26] In considering the negative aspects of one very popular treatment for this existential angst he writes:

> Prozac treats the self rather than the disease … it alters personality and feeds dangerously into the American obsession with competition and worldly success…and so … it offers a mechanistic cure for spiritual problems… and …for all the good they [these drugs] do, the ills that they treat are part and parcel of the lonely, forgetful and unbearably sad place where we live.

Elliott is disturbed by the "medicalization of unhappiness" and warns of the "tyranny of happiness". He recommends non-pharmacological solutions to existential problems and suggests that we need alternative approaches which focus on changing customs, vigilance and a tightening of diagnostic procedures. However this is problematic. While some suffering may be beneficial, drawing a line between productive and unproductive suffering is problematic. At what point should people be left to struggle with, and at what point should they be extricated from, their predicaments? Some individuals who are otherwise performing well may need a psychoactive agent to bring them into a normal range in stressful situations—such as sitting examinations or performing in public. There is no simple answer as to whether drugs should be prohibited, restricted or promoted and subsidised. There is a need,

rather, to consider costs and benefits on a case by case basis while exercising a precautionary approach. Caution is clearly prudent in the light of the fact that many drugs now restricted or banned were once promoted as unproblematic panaceas, and whose addictive or destructive character only became apparent gradually.

Should those who are mildly affected by psychological afflictions—such as unhappiness, shyness, hypochondria, melancholia, or mild depression—but who are still functioning, if sub-optimally, be denied psychotropic drug treatment because of concerns about the effects of enhancement? Elliott, Fukuyama, Kass and other ethicists would recommend limiting psychotropic drug use and seeking alternative ways of addressing a wide range of social problems, some of which may be generated by the empty spaces left by our usurped gods.

There is little hope that the trends of individualism, hedonism, competitive aggression, and alienation will correct themselves spontaneously. That is, if our growth-addicted, market-driven consumer society is ultimately responsible for the angst-ridden "low serotonin society", then it may be that—in the absence of an improbably social and economic *volte-face*—the only remedy for many may be psychoactive drug palliation.

Human brains have been shaped by millions of years of evolution which have fine-tuned them as instruments for survival and reproduction. Interfering with these complex systems with psychoactive drugs should not be undertaken lightly. Attempting to reshape our natural dispositions and responses for whatever purposes represents, according to Kass *et al*, a "failure to respect the giftedness of the natural world." Such hubristic use of psychoactive drugs may reduce our ability "to act freely, for ourselves, by our own efforts

and to consider ourselves responsible, worthy of praise or blame…" and lead us to "… a time of wilfulness over giftedness, of dominion over reverence." [27]

If this precautionary approach is justified with respect to the issue of cognitive enhancement—because we risk disturbing a hard-won balance to which we are adapted—it will apply even more to the issue of longevity enhancement through the use of drugs or by genetic engineering.

The respect which we owe to nature however is clearly not unconditional. Nature, after all, delivers not just exquisitely adapted biological systems, but pestilence such as smallpox, malaria, cancer, Alzheimers and AIDS. Devastating catastrophes are perfectly *natural*, and the use of diagnostic scans, antibiotics, vaccines, contraceptive pills and embryo screening are the product of human contrivance rather than nature. The sublime and mysterious power of nature—as well as its pitiless indifference—has slowly yielded to human inquiry and to our constantly expanding knowledge. Nature should be treated with respect—biological processes have evolved over billion-year geological time scales and have thereby proved their robustness—but not always with reverence and humility. While it is important to be mindful of the danger of Promethean hubris generating mishap or disaster—which may generate natural and catastrophic self correction—as Kass *et al* warn us, humility has its own dangers and *failing to act* may also have catastrophic consequences.

We have noted already that there is a wide and disparate variety of psychotropic substances and cognitive enhancement procedures in use—including meditation, alcohol, cannabis, coaching colleges, and caffeine. All of these may be used legitimately, at least in moderation, without apparent ill-effects. Why then should we not use the

expanded psychopharmacopia even more widely, to redress existing social inequalities, and further enrich the human condition? [28]

A major concern about actual and potential use of psychoactive drugs—and genetic engineering—is that we may be introducing changes which reshape natural systems at a rate and on a scale which are quite different from anything that has been experienced in the course of human evolution. It may be that these changes are too rapid, too discontinuous and too chaotic for the correction of problems that will almost certainly arise and which we cannot yet see.

There are, then, clear dangers in making a wide range of psychoactive drugs freely available, even (and especially) if costs were low and side effects minimal. A society whose members are insulated from emotional upheaval and the pain and struggle of the human condition would probably be far from healthy and perhaps be at risk of fragmentation and social collapse. [29]

We suggest that the ubiquitous use of psychoactive drugs is neither desirable nor inevitable. Humanity's long and chequered experience with psychoactive drugs provides grounds for caution. The efficacy, benefits, side effects, and costs of the new enhancers need to be considered, and compared carefully with a range of benign alternatives. However the opportunity for (legal) multi-billion dollar profits, the possibility of selling enhancements together with soft addiction, and the widespread desire to find a panacea for life's troubling discomforts will almost certainly guarantee that the development, refinement, production and use of these drugs in affluent western countries will continue apace. [30]

The use of psychoactive drugs for non-therapeutic (or marginally therapeutic) purposes in the second and third groups identified above warrants continuing critical attention. We have noted a strong body of bioethical opinion counselling caution about rapidly expanding the use of these agents beyond clearly therapeutic cases. The debate about the wider use of psychoactive drugs is lopsided, with cautious counselling mixed with advice from unbridled enthusiasts, such as the so-called "paradise engineers". The debate is complex and polarised and, because psychoactive agents have the potential to radically reshape our cognitive and affective structures, urgent. We believe that it is important to avoid the extreme positions of the alarmists and the "paradise engineers", and recommend continuing with vigorous and searching examination of not just pharmacology but also of the salient ethical, cultural and socio-economic factors. We believe that these considerations apply both to the issue of cognitive enhancement and to the issue of longevity enhancement.

Conclusion

In many applications it seems that psychoactive drugs are used therapeutically and virtually certain that this use will increase further. Discussion of psychoactive drug use should be separated from genetic enhancement technologies, in particular those aimed at germ line changes. [31]

On balance and at our present level of biotechnology, it seems unlikely that human nature and consciousness are under threat by psychoactive drugs used for either therapeutic or enhancement purposes. However we need to remain vigilant over whatever blandishments or "devil's bargain" propositions that smart marketers might conjure up. [32]

It is important therefore to maintain a cautious, critical and comprehensive watch on developing enhancement technologies and to foster a continuing social debate involving bioethicists about their application and utilisation. Based on the concerns discussed in this paper we believe that the development and application of enhancement technologies—for cognitive enhancement, as well as for longevity—is problematic, especially with respect to applications involving germ line genetic engineering, and that their development should be carefully guided by a precautionary approach. [33]

Bibliography

Begley, D.J. *et al.* (eds). 2000. *The Blood Brain Barrier and Drug Delivery to the CNS*. New York: Dekker

Breggin, P.R. 2000. *Reclaiming Our Children: A Healing Solution for a Nation in Crisis*. Cambridge MA: Perseus

Breggin, P.R. 2004. Suicidality, violence and mania caused by selective serotonin reuptake inhibitors (SSRIs): A review and analysis, *International Journal of Risk and Safety in Medicine* 16: 31-49

Caldicott, F. 1998. Mental Disorders and Genetics: The Ethical Context, *Nuffield Council on Bioethics* report. URL: http://www.nuffieldbioethics.org/fileLibrary/pdf/mentaldisorders2001.pdf

Caplan, A. 2003. 'Is Better Best?' *Scientific American*, Sep: 84-85

Caplan, A. 2003a. 'No-Brainer: Can We Cope with the Ethical Ramifications of New Knowledge of the Human Brain?' in Markus (2003): 95-106

Dawkins, R. 1999. *The Extended Phenotype*. Oxford: Oxford University Press.

Dennett, D. C. 1983. 'Information, Technology and the Virtues of Ignorance', *Daedalus* 112: 135-153.

Diller, L. 2002. 'Prescription Stimulant Use in American Children: Ethical Issues.' Presentation at the President's Council on Bioethics, Washington, D.C., 2 December. URL: http://www.bioethics.gov/transcripts/dec02/session3.html

Elliott, C. 1998. 'The Tyranny of Happiness: Ethics and Cosmetic Psychopharmacology', in Parens (1998): 177-188

Elliott, C. 2000. 'Pursued by Happiness and Beaten Senseless: Prozac and the American Dream', *Hastings Center Report* 30, No 2: 7-12

Fukuyama, F. 2002. *Our Posthuman Future: Consequences of the Biotechnology Revolution*. London: Profile Books

Grey, W. 1996. 'The Ethics of Human Genetic Engineering', *Australian Biologist*, 9: 50-56

Grey, W. 2005. 'Design Constraints for the Post-human Future', *Monash Bioethics Review* 24: 10-19

Huxley, A. 1939. *After Many a Summer*. London: Chatto & Windus

Huxley, A. 1932. *Brave New World*. London: Chatto & Windus

James, O. 1998. *Britain on the Couch: Treating a Low Serotonin Society*. London: Century.

Kass, L.R. 2003. *Beyond Therapy: Biotechnology and the Pursuit of Happiness*. New York: Regan Books.

Kass, L.R. 2003a. *Life, Liberty and the Defense of Dignity*. San Francisco: Encounter Books

Kramer, P.D. 1993. *Listening to Prozac*, New York: Penguin

Kramer, P.D. 2002. 'Happiness and Sadness: Depression and the Pharmacological Elevation of Mood.' Presentation at the President's Council on Bioethics, Washington, D.C., 12 September. URL:
http://www.bioethics.gov/transcripts/sep02/session3.html

Laland, K.N. *et al*. 1999. 'Niche Construction, Biological Evolution and Cultural Change'. *Behavioral and Brain Sciences* 23 (2001) URL:
http://www.bbsonline.org/documents/a/00/00/05/28/

LeDoux, J. 2003. 'The Self: Clues from the Brain' In LeDoux, J. *et al*. (eds) *The Self: From Soul To Brain.* Annals of the New York Academy of Sciences, Vol 1001.

Markus, S.J. (ed). 2002. *Neuroethics: Mapping The Field*. New York: Dana Press

NYAS 2003. 'Meeting Neuroethical Challenges in Cognitive Enhancement'. *Meeting of the New York Academy of Sciences*, 16-17 June. URL:
http://www.nyas.org./ebriefreps/splash.asp?intebriefID=214

Parens, E. 1998. *Enhancing Human Traits: Ethical and Social Implications*. Washington, D.C., Georgetown University Press

Parens, E. 1998a. 'Is Better Always Good? The Enhancement Project'. In Parens (1998): 1-28

Parens, E. 2002. 'How Far Will the Treatment/Enhancement Distinction Get Us as We Grapple with New Ways to Shape Ourselves?' in Markus (2002): 152-158

Pinker, S. 2003. 'The Designer Baby Myth', *Guardian*, Thursday June 5

Restak, R. 2000. *Mysteries of the Mind*. Washington DC: National Geographic Society

Root Wolpe. P. 2002. 'Treatment, Enhancement, and the Ethics of Neurotherapeutics, *Brain and Cognition*, 50: 387-395

Root Wolpe, P. 2002a. 'Neurotechnology, Cyborgs, and the Sense of Self', in Markus (2002): 159-191

Root Wolpe, P. 2003. Social and Ethical Barriers to Enhancement. NYAC (2003)

Rothman, S., and Rothman D. 2003. *The Pursuit of Perfection: The Promise and Perils of Medical Enhancement*. New York: Pantheon

Salleh, A. 2003. 'Brain shrinkage: early sign of schizophrenia?' *ABC News in Science*, Aug 18. URL http://www.abc.net.au/science/articles/2003/08/18/925547.htm

Scientific American 2003. 'The Brain Issue', September.

Singer, E. 2004. 'The Master Switch', *New Scientist*, Mar 6: 35-37

Sowell, E.R. *et al.* 2003. 'Cortical abnormalities in children and adolescents with attention deficit hyperactivity disorder'. *Lancet* 362 (9397): 1699-707

Studwell, J. 2004. Oh, behave, *Financial Times*, Jan 23. URL: www.FT.com

Endnotes

1. Huxley (1939).

2. See Kass (2003); Markus (2002); NYAS (2003); *Scientific American* (2003); Studwell (2004).

3. Huxley (1932).

4. Fukuyama (2002).

5. Two major advances which could transform treatments are changes affecting the master neurotransmitter glutamate (Singer 2004), and the development of methods to overcome the blood-brain barrier, which limits psychoactive drugs to lipophilic small molecules (Begley 2000). Overcoming the blood-brain barrier opens the possibility of creating a suite of new and better-targeted drugs.

6. Members of the third world are not in general afflicted by the alienation, fear, uncertainty, stress, loneliness, competition (as well as by the associated mindless profit- and consumption-driven behaviour) that generates the anxiety, melancholy and depression so widespread in western countries. This is not to deny that the less affluent majority have their own problems, as well as their own low-cost enhancements and remedies. The conditions of anxiety, fear, shyness, stress, aggression, restlessness and depression in the west have been described as a type of "synaptic

sickness" (LeDoux 2003) whose sufferers constitute what has been called the "low serotonin society" (James 1998). This condition (if real) seems to be peculiar to wealthy western countries peopled by the sedentary, hedonistic and narcissistic, "me, I, myself" generation, with its culture of aggressive and competitive individuality—frequently accompanied by family breakdown, and elastic moral values.

7. Caplan (2003; 2003a).

8. Dawkins (1999); Laland (1999).

9. Mind affecting substances used—and abused—include: caffeine, alcohol (ethanol), nicotine, hashish, opium, kava, kat, coca leaf, betel nut, St Johns wort, ginko, brami, various inhalants, cactus or fungal extracts (e.g. LSD), cocaine, heroin and amphetamine derivatives.

10. There are also substances such as petrol, aerosol propellants or paint thinners often used by the young and the disadvantaged, that have destructive and debilitating effects.

11. Like the selective serotonin reuptake inhibitors (SSRIs) such as Prozac (fluoxitine-hydrochloride), or stimulants such as Ritalin (methylphenidate).

12. Restak (2000).

13. Synaptic connections constitute the complex network of approximately 100 trillion nerve synapses which form the systems that encode memory, the self, personality and character.

14. Ritalin and Adderall (amphetamine) are chemically related groups of psychoactive drugs prescribed to treat hyperactivity and attention deficit disorder (ADHD) by

acting on levels of the neurotransmitter dopamine. Modafinil (2-diphenylmethylsulfinyl-acetamide) was developed to treat narcolepsy, and acts on norepinephrine. Prozac is a SSRI developed to treat depression. The benzodiazepine group (including Valium, Librium, Mogadon) was developed to treat anxiety, and act on gamma aminobutyric acid (GABA), the primary inhibitory neurotransmitter of the brain. These psychoactive drugs are used to treat anxiety, depression, various psychopathologies and narcolepsy. However, they may also improve physical and mental performance, reduce exam stress, improve attention and produce a feeling of well-being in "normal" healthy individuals. There is also a growing number of learning and memory enhancing drugs available, such as donepzil or ampakines, that are used both for therapy and for enhancement.

15. It has been estimated that about fifty percent of our traits are pre-encoded by our genes, which are also responsible for the formation of the structures through which we acquire, modify, store and retrieve information. Learning and experience are responsible for generating the remainder of our traits.

16. Kramer (1993; 2002).

17. Diller (2002); Breggin (2000; 2003).

18. These are explored by powerful scanning technologies including Positron Emission Tomography (PET) and functional Magnetic Resonance Imaging (fMRI). See Salleh (2003) and Sowell (2003).

19. Rothman and Rothman (2003).

20. Parens (1998).

21. Caldicott (1998) supports this approach in his report to the Nuffield Council on Bioethics: "A broad and humanistic perspective may be considered to have two basic requirements: respect for human beings and human dignity, and the limitation of harm to, and suffering of, all human beings".

22. Parens (2002). See also Parens (1998a).

23. Kass (2003) has suggested that high self-esteem is earned by the person who has worked hard and consistently but not by those who "cut corners" with pharmacology.

24. Root Wolpe (2002; 2002a; 2003).

25. The importance of ignorance and forgetting has also been stressed by Daniel Dennett (1983).

26. Elliott (2000). See also Elliott (1998).

27. Kass (2003).

28. There is a new utopian movement growing around these drugs; some of these views may be found at the website http://nootropics.com/smartdrugs/brainviagra.html . See also the Paradise Engineering website: http://www.bltc.com/ .

29. The utopian vision promoted by "paradise engineers" is disturbingly close to the dystopian vision of Huxley (1932).

30. It is worth recalling H.L. Mencken's remark "for every complex problem there is a solution that is simple, neat and wrong".

31. Such interventions will pose a different set of more serious ethical questions and ethical challenges but they are

in the future, as Pinker (2003) writes "my point is not that genetic enhancement is impossible, just that it is far from inevitable," and with regard to having designer babies, "these traumatic and expensive procedures are not likely to be available soon" …and… "we can deal with the ethical conundrums if and when they arise".

32. On balance with therapeutic psychoactive drug use good appears to outweigh harm, but their use must continue to be debated by social critics independent of government, professional or industry regulatory agencies and stakeholders. Partly because of the high profitability of this enterprise and partly because of the strength of the connections between drug companies, government and health-professionals, is it not sufficient to have oversight or regulatory powers delegated solely to any of these interest groups. Monitoring should be robust where drugs are used with individuals under the age of eighteen, the elderly or other vulnerable groups or where advertising promotes enhancement.

33. For further argument in support of a precautionary approach to human germ line genetic engineering, see Grey (2005). See also Grey (1996).

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