A Bioethical Paradigm for Enhanced, Post or Transhumans in Medicine and Biological Research

Roderick Williams

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A BIOETHICAL PARADIGM FOR ENHANCED, POST OR TRANSHUMANS IN MEDICINE AND BIOLOGICAL RESEARCH

A Dissertation
Submitted to the McAnulty College and Graduate School of Liberal Arts

Duquesne University

In partial fulfillment of the requirements for
the degree of Doctor of Philosophy

By
Roderick K. Williams

August 2020
A BIOETHICAL PARADIGM FOR ENHANCED, POST OR TRANSHUMANS
IN MEDICINE AND BIOLOGICAL RESEARCH

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ABSTRACT

A BIOETHICAL PARADIGM FOR ENHANCED, POST OR TRANSHUMANS
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August 2020

Dissertation supervised by Joris Gielen

In this dissertation the question addressed is the ethical protocol that should be used when enhanced, post or transhumans present themselves as patients to hospitals, or as subjects for scientific research. With the advent of the birth of four children who were genetically engineered in China to be resistant to HIV, I contend that transhumans are already here, and the prevailing Western paradigm of principlism, while good, is not adequate to the task. I explore the basic religious argument that can be used against or in favor of what I call human-directed human evolution. I show how the fears of new kinds of persons are can be traced not just to myth, but also to the genre of science fiction. I start with Mary Shelley’s *Frankenstein or The Modern Prometheus*, through Star-Trek’s Borg Queen, and forward to BBC America’s “Orphan Black”. The argument for moral enhancement, a concept for which Julian Savulescu argues, is examined as is Nick Bostrom’s explication of superintelligence, and his joining Savulescu’s call for an enhancement of moral values. Several technologies currently in use for genetic testing, and that
can be used for genetic engineering will be explained. These include preimplantation genetic
diagnosis and mitochondrial replacement techniques (MRT), which are used to avoid birth
defects in potential offspring. CRISPR-Cas9, TALENs, cloning and haploid stem cells are the
technologies that not only can be used to develop specific treatment mechanisms, but they are the
mechanisms that will allow humankind to engineer new kinds of persons, thus creating
transhumans. From here I address the two prevailing sides of how to proceed: precaution where
we move slowly trying to ascertain and prepare for any negative eventuality, and proaction
where we move directly ahead after we have done all we can to prepare but opt to adjust along
the way as the need arises. The ethical argument I make for the protocol that I think must be
adopted does not just come from an examination of principism. I also incorporate concepts from
Buddhism, Confucianism, Islam, Hinduism and African philosophy. I posit that two other
principles are needed: Particularity and Intrinsic Personhood.
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INTRODUCTION

We favor morphological freedom – the right to modify and enhance one’s body, cognition and emotions. This freedom includes the right to use or not to use techniques and technologies to extend life, preserve the self through cryonics, uploading, and other means, and to choose further modifications and enhancements.¹

The advent of an ewe called Dolly changed the boundaries of what science could do as far as the direction of human evolution that could be controlled by humans themselves. Humankind could now produce other humans without the necessity of sexual intercourse. Since governments tend to be precautionary by nature the first inclination was to ban the tool of cloning, and other forms of genetic experimentation, especially if the experimentation would affect the germline. In the developed world fear of the unknown was no less prevalent than one would imagine it to be in the less developed countries of the world. Just because the knowledge and technology to move science to its outer reaches exists in the developed world, it does not follow that the people and authorities therein are comfortable about where science and technology can and is taking them.

The quotation above is the eighth principle of the Transhumanist Declaration of 2012, the manifesto of the transhumanist school of thought/movement. In the first principle the motivating aims of transhumanism are laid out; these are overcoming less than optimal intellectual/cognitive capacity, ageing, involuntary suffering, and breaking the bonds of humankind to planet Earth itself.² The second principle is just an acknowledgement that humankind has great potential, and
that the time is right for a multi-pronged approach to human improvement. The third principle recognizes that there is risk, and sets up the fourth principle’s call for risk-benefit analysis, with public input and a means of implementation of the benefits. Funding for the priorities of the improvement of humankind’s foresight and wisdom, the reduction of threats to human health and life, and the alleviation of grave suffering is called for in principle number five. Respect for personal autonomy, inclusive and responsible moral vision, concern for the dignity and interests of all of humanity, and an affirmative concern for future generations in government policy characterizes the sixth principle. Finally, the seventh principle advocates for human and sentient nonhuman beings existing now and in the future, and also for modified life-forms and artificial intellects, and any other intelligences that result from technological and scientific advances. All of these principles regarding where humankind should go when it comes to their evolution are salutary, but before we march off under this banner the question of ethical responsibility must be considered.

1.1 Ethical Responsibility

Peter Osuji, of Duquesne University, points out in his book African Traditional Medicine: Autonomy and Informed Consent, that in African traditional medicine (ATM) decisions are made by patients and consent given by the patient as part of the community, as well as in consultation with the ATM doctor. Arguments are often made that this ethos should to a degree be followed when it comes to designing progeny. The dominant mode of thinking in the United States and most of the global north is that parents have personal autonomy when making decisions for their children. Indeed, people like John Harris argue that not only do parents have autonomy in this area, but they have a moral obligation to enhance their children. Autonomy in parental decision-making may be only a part of the process. Governments may be the super
entity whose consent must be gained when it comes to whether human enhancement will be available.

1.1.1 Autonomy

Beauchamp and Childress define personal autonomy as self-governance. This governance must be interference and coercion free, and it must not be limited by a lack of adequate information. The patient also must have his/her autonomy respected. Beauchamp and Childress write that respect for someone’s autonomy is rather simple and straightforward. It entails acknowledging the person’s right to make decisions, hold views, and take actions that are concurrent with their belief and value systems. Action characterizes this respect, i.e. doing what is necessary to allow a person to exercise their autonomy. Potential parents may decide that it is perfectly acceptable – indeed desirable – to subtract harmful genes from their gametes, and add enhancing genes to them. Should that decision be automatically accepted by the larger community, i.e. humankind?

In defining human genetics Michael Parker writes that human genetics is driven by rapid and “spectacular” advances in knowledge. The effects of these are societal and therefore the makeup of future generations, the “sort of people brought into the world”, are in many ways determined by these effects. Some of them can be negative to society. The “heredity of character” is one of those problematic effects. John Harris does not take the bait that these simple statements by Parker present, rather he argues that risks and benefits are arranged on a continuum, reasons for giving birth to children with disabilities, avoiding harm to others and benefitting others can all rest upon that line. We have legitimate and moral reasons not to harm others, and to provide others with benefits. Having children who are healthier, even enhanced is
a good, a benefit, that we morally must avail ourselves of. As autonomous agents we must act to embrace the benefit. Parents act ethically when they embrace this benefit.16

Communitarians argue that the stress upon the autonomy rights of the individual get too much emphasis, while those of the community are subordinated to them. This undermines family, relational and community sustaining values.17 Infact, the most important ethical questions modern medicine wrestles with grow out of one’s location in relationship to others.18 The last conclusion holds the seed of what makes the conclusion a false one. The individualism of the autonomy principle comes out of community. The principle applies to all individuals, and does not rule out input from the wider world. This fact that one’s personal autonomy is a function of one being in community and interacting with others opens the door to what communitarians are advocating for, that there be a public process for gaining consensus on the limits, direction, of genetic experimentation, and who has autonomy and the right to give consent in the area of human genetics.19 All in all it is just that the right of decision-making (autonomy) should be reserved for those who are directly affected by the decision.

1.1.2 Consent

The autonomy-based model of informed consent is characterized by the autonomous agent’s authorization of medical procedures and therapies, and participation in research. In this case specific authorization is necessary.20 Consent falls under the principlism tenet of autonomy. A subject that does not know what they are facing cannot give informed consent. Accordingly, the subject must be given all necessary information concerning the plan and outcomes that will be studied, and in the case of medical treatment the diagnosis, therapies to be given and the most likely prognosis.21 Then it must be ascertained whether the subject has a clear understanding of the information they have been given.22 The subject has to be allowed to consider what they have
been given and to weigh this information against whatever decision-making rubric that they use.\textsuperscript{23} Then the subject must affirmatively choose to partake in the study, or undertake the therapies.\textsuperscript{24} Disclosure, understanding, decision and authorization are the basic tenets of informed consent. The potential parents of designed progeny must take advantage of this process. The progeny, because they are not yet born, cannot give informed consent.

France attempted to allow for already born persons to gain remedy for their birth, in the case of those born with disabilities. In 2000 the highest appeals court of France awarded compensation to Nicholas Perruche, and is said to have established a “right not to be born”.\textsuperscript{25} Indeed, the ruling recognized that the child him or herself had the right to seek damages.\textsuperscript{26} In 2002 the National Assembly of the French Parliament passed a bill that overturned the Perruche Judgment, establishing that “no one can sue for damages for the sole fact of their birth”.\textsuperscript{27} With that the sole societal attempt to, at least in reverse, to say that the progeny of people though unable to give informed consent can hold parties accountable for their physical conditions resulting from their birth.

Those who object to the foundational premise of this dissertation, that the genetic design of human progeny is a desirable evolutionary practice, would argue that in the context of consent the wishes of the larger society must be included. In essence, they are coming down on the side of the Confucian doctrine of zhongyong, equilibrium and harmony in human nature and interaction underlie humankind’s moral being, and prevails throughout the universe. In society equilibrium must be sought and maintained.\textsuperscript{28} This amounts to the virtue of practicing humanity called ren.\textsuperscript{29} In his argument against Harris’ position on prenatal genetic enhancement Ryan Tonkens writes that it is misguided thinking that parents are obligated only to do that which prevents undue harm to their progeny, rather than anything that is beneficial to them.\textsuperscript{30} Also,
since we have not produced a cohort of designed or enhanced progeny, we lack the empirical evidence to say what effect their presence and creation will have on society, or on the progeny themselves.\textsuperscript{31} Michael Parker, while standing with the concept of individual autonomy, makes the case that procreative autonomy while individual and personal, is not by default anti-communitarian.\textsuperscript{32} He ultimately concludes that because the research in the realm of genetics and genetic enhancement as it relates to procreation is global, deliberation about the morality and ethics in this field must be global. Diversity of culture and opinion may not yield absolute consensus, but it is imperative that the process be one resulting from a societal consensus.\textsuperscript{33}

1.2 Human Enhancement

Enhancement can take place through many different advancements. It can be cybernetic where the organic person and computers interface, or cyborgic where there are mechanical prostheses of some kind temporarily or permanently affixed to the organic person. Transgenic parts can be incorporated into the human person, that is parts of other fauna or flora. However, it is the genetic manipulation of the germline for purposes of producing humans by design that causes fear in the hearts of men. The idea of persons with hyper-intelligence especially frightens most people, as popular entertainment makes clear. Bostrom addresses this sort of intelligence. Savulescu seeks to make us think before we fear, and suggests that our ethics and morals need to be enhanced so as to be able to deal fairly with these persons.

1.2.1 Bostrom: Superintelligence

In his book Superintelligence: Paths, Dangers, Strategies Nick Bostrom writes that a race (competitive) dynamic is extant when a project fears being overtaken by another project.\textsuperscript{34} The project fearful of obsolescence is humankind with normative intelligence quotients. So that
artificial intelligence doesn’t overwhelm them, humankind is searching for a method of dramatically increasing our IQ points. Bostrom thinks that he most likely scenario for this is that of iterated embryo selection. It is a process in which embryos that are higher in cognitive ability traits are typed, and from which stem cells are extracted and converted into gamete cells. In six months they should mature. The sperm and ova cells are combined to produce viable embryos. This process is repeated until large genetic changes are accumulated. Ten or more generations will be realized within a few years, and the cell lines produced by the procedure could produce a giant number of enhanced embryos.

The archetypes of the Terminator and the Borg Queen are what people assume will happen as AI becomes more pervasive. Both are personifications of the AI Takeover Scenario Bostrom writes about. Here, a simple piece of code is sent through package delivery to a person with a sophisticated enough computer system so as to enable it to access and colonize a very wide network of systems. The code is nanotechnological, with both organic (DNA), and cybernetic parts. This is fixed in an appropriate medium and then uploaded to a favorable system. The wet nanosystem can receive external messages, and upon instruction constructs more complex systemic networks. Soon it is able to upload itself to space computing and satellite systems. From there it can outrun the first project (humankind) which created it, either assimilating it like the feminine Borg Queen, or destroying it like the Terminators.

Writing with Anders Sanberg, Bostrom writes a simple but instructive sentence. In it he states that evolution is so powerful a process that it produced the system that is the human brain, and this system is more efficient and complex than anything an engineer or scientist have been able to produce. Within this system is the fuel of intelligence. Among human beings there is a range of fuel (intelligence quotient) that power the system. John Harris would say that parents
have a moral obligation to push to enhance the quotient of intelligence in their progeny. He rails against the notion that human directed enhancement is unholy, as in humans playing God, or unnatural, as in not a part of Darwin’s natural selection of traits. With the exception of iterated embryo selection, Bostrom’s opus is an explication of artificial, not organic, means for achieving superintelligence. Because of this under a heading entitled “Will the best in human nature please stand up”, Bostrom warns us that the superintelligence explosion is a time bomb, and he believes that humankind is not ready to deal with the fallout from the explosion. Superintelligence is powerful, but humankind is to his mind, immature. He is afraid that though he reckons that superintelligence is a long way off, some playful idiot may push the button just to see what will happen. In the afterword to the paperback edition Bostrom writes about the rapid rise of machine learning, and argues that this is because more funding is going to this field, whereas AI safety and impact fields funding is not keeping up. The public concern about these changes are more short-term as in cybercrime, privacy, self-driving cars, autonomous weapons, and automated job replacement. The Terminator movies inform the existential fears of the public in this area, and Bostrom warns against engineers and scientists circling the wagons, ignoring the ethical and practical concerns, and plunging head-long in further development.

1.2.2 Moral Enhancement (Savulescu)

Bert Gordijn and Henk ten Have, in an editorial in Medical Health Care and Philosophy, tackle the question of moral enhancement, in particular by technological means. The question of whether the drug oxytocin has a salutatory effect upon human morality when it is prescribed prompted the authors to devise four suppositions that would be required to assess if morality could be biotechnologically enhanced. The suppositions are (1) that morality has a biological substrate, (2) the relationship between morality and the biological substrate is familiar to the
degree to suggest methods by which the biological can be manipulated to enhance the moral, (3) that technological interventions can be created that will allow the hoped for biological change as well as the corresponding moral enhancement without many side effects, and (4) there are real world contexts in which these enhancements could be employed.47 Organic beings, of course, carry the logos of morality within themselves; there is no disembodied autonomous morality.48

Julian Savulescu and his co-author Ingmar Persson would find this theory helpful to their argument that along with physical and cognitive enhancement, humankind requires moral enhancement. Even though, their book dealt solely with the issues of weapons of mass destruction and climate change, the underlying case being made is that to meet these dangers, and I would argue any paradigm shift that occurs as a result of designed-humans’ existence, the moral motivation of humankind must be improved, enhanced, so that the potential fate and welfare of succeeding generations of whatever sort of persons that exist, and other types of fauna will have full importance.49 They argue that moral education can be an important component of this enhancement, however the use of biology in conjunction with this could also be desirable. In other words, Persson and Savulescu advocate for the technological improvement Gordijn and ten Have comment upon. Persson and Savulescu see pursuing moral enhancement through scientific and technological means as imperative. While education can be applied to the youngest persons, scientific and/or technological methods will have to be applied to persons who are deficient in the necessary moral traits.50

The aim of the position for moral enhancement is to get humankind to the basic tier of common-sense morality which is mitigating harm.51 Ultimately, the development of common-sense morality is about allowing people to live together and equitably share resources, peacefully.52 This is the basis for what developed into what we now call human rights. Moral
enhancement is necessary to humankind’s being able to construct an ethical regime for any sort of interaction with different sorts of persons. It is also necessary because people tend to fear or be suspicious of anyone who is very different. That is what Shelley’s Frankenstein is about.\textsuperscript{53} Frankenstein’s Creature can be said, in its simpliest form, to have been rejected because he was physically grotesque. Like Bostrom’s potentially superintelligent persons, when the Creature is encountered by people they see threat.\textsuperscript{54} They assume that this different person is here to do harm, rather than bring benefit. Rather than assuming brute criminality or AI takeover, it will be imperative that normative humankind sees different persons only as different persons. Moral enhancement will aid in that, but it is also imperative that humankind learn the new morality. Leif Wenar, chair of Law and Philosophy at King’s College, London believes that humanity will learn. He cites the fact that after atomic experimentation led to atomic bombing of Hiroshima and Nagasaki, Japan, nations learned the horror of such weapons and have come to the consensus that they should never be used again.\textsuperscript{55} Humankind just needs time to learn, and they tend to do so as identities alter to be more open and less aggressive, allowing social networks to form joining capacities and resources.\textsuperscript{56} If humankind learns the new morality then the door will be open to transhumanism.

### 1.3 Transhumanism: Precaution and Proaction

There are still two warring camps to consider when it comes to whether humankind should pursue directing our own evolution, the precautionary camp and the proactionary camp. Society will have to find a way to either overcome one, or reconcile both if human directed evolution is to proceed. This subsection will examine the arguments on both sides.
1.3.1 The Precautionary Principle

Nathan Dinneen in his essay on precautionary discourse, gives an expansive interpretation of what the precautionary principle is. It is distinct from the precautionary approach, though they are intimately related. The precautionary principle builds from simple precaution, which sees precaution as pragmatic and not always principled. Because of scientific uncertainty it is useful to follow precaution. The precautionary principle sees precaution as principled, as well as pragmatic, and thus grounds it in morality and legality. Calls to act in the interest of future generations can fall within its parameters, as can arguments for respect for human dignity. In the United States, precautionary approach is often used rather than precautionary principle. This helps to allow the discussion to take on elements of the policy arguments located in risk assessment and cost-benefit analysis.

S. D. John writing about the precautionary principle’s use in the field of public health policy, concludes that the principle’s correct application should be practical, and it should be justifiable, not applied to some contested concept of good. The use of risk assessment and cost-benefit analysis is appropriate. The analysis should assess whether outcomes would be good, normal-bad or special-bad. Good outcomes are those which either intentionally or unintentionally, inure to the good of society in some way. Normal-bad outcomes are low level negative things that are likely to result from the action taken, (application of the principle). Special-bad outcomes are high level negatives resulting from a given action, (application of the principle). Special-bad outcomes do not fit neatly in risk-cost-benefit assessment. The whole idea is to try to ascertain what state of affairs will exist after an action is taken. This is a consequentialist view, but it is the practical view.
Proposals for actions are assessed with an eye to outcomes, and as such policy necessarily will turn upon what gives the most value, i.e. benefit to the greatest number of people, and shuns special-bad outcomes. Caution sometimes causes policy not to take action that will cause good outcomes, because special-bad outcomes could also result from the action. Because a special-bad outcome is a higher order negative outcome, policy has the obligation to avoid it. This can be based upon science and the preferences of the individual citizen, because not all objections are rational (i.e. scientific, mathematical). Some are based upon duty, moral obligation and right action (deontological beliefs).

The question for this and other chapters is whether designing progeny, and enhancing people is cause for precaution. The precautionary principle is regarded as originating in the Rio Declaration on the Environment and Development. In this document perceived harm to the environment and/or humankind should be assessed in a precautionary manner, even if in some cases science does not fully support the finding of harm. Historically, it has been taken for granted that designing progeny is problematic and the precautionary principle does apply. Max More makes the point that as it relates to human enhancement the precautionary principle itself harms humankind by trying too hard to safeguard it. Its emphasis is upon avoiding risk, i.e. avoiding harm. The underlying fear within the principle itself harms humankind by limiting progress, and taking resources and consideration from other important issues. The principle also assumes that prohibition will not result in any harm to the environment or humankind. The precautionary principle may curtail objectivity, especially if deontological concerns are given undue importance.
1.3.2 The Proactionary Imperative (More, Fuller and Lipinska)

More writes that the burden of proof (of harm), rests solely on the shoulders of the advocates of the precautionary principle, in other words, those who would restrict technological advances. He also proposes three directives for the proactionary principle: (1) Progress must proceed with eyes wide-open, not from a base of fear; (2) This freedom to innovate and progress must be protected, and collateral effects must be planned for; and (3) Think about innovation objectively, comprehensively and with balance, manage it for maximum human benefit and encourage bold, proactive innovation. Further, More sets forth five component principles of the proactionary principle. 1. Be objective and comprehensive. 2. Prioritize natural and human risks. 3. Embrace diverse input. 4. Make response and restitution proportionate. 5. Revisit and revise in an ongoing manner.

Gianluca Parolin writing about the Statement of al-Azhar in Egypt, in the 2012 system of fundamental freedoms, gives us in the West a rather unexpected support to proaction in scientific experimentation, pointing out that there is a freedom of serious scientific research (al-baht al-ilmi al-gadd), and that this freedom is deemed necessary for human progress (qatirat al-tagaddum al-basari) in Islam. This is an example that shows that in Islam as is the case in other religious traditions there is no express bar to proactive human enhancement. In this way Islam tracts with Christianity, which will be treated in depth in chapter three, because neither is precautionary when it comes to scientific advancement.

Francoise Baylis and Jason Robert make it clear that because of motivations like possible profits, what they call heedless liberalism, the desire for knowledge, the desire to outperform one another, and the determination of those among us for whom achieving self-actualization via controlling at least some of human evolution, the enhancement of humans is inevitable. Fuller
and Lipinska are of similar belief, and have issued the “Proactionary Manifesto”, and written The Proactionary Imperative: A Foundation for Transhumanism. They declare that humankind does not have to belong solely to the genus and species homo sapiens. A being has to possess humanity, and thus, any being possessing the quality of humanity can be a person. From there they advocate for the exploration of the possibilities and opportunities offered by science and technology to create these new possessors of humanity. They argue that as homo sapiens, wise hominids, humankind is not bound by the confines of nature. Instead, humankind gives meaning to a pointless nature when it is shaped to human will. The idea is to take humankind well beyond the confines of so-called nature via a process of self-transcendence. For Fuller and Lipinska this comes down to the value of being human, whether we are animals with far too much intelligence, or deities needing more resources. Are humans to be precautionary or proactionary?

Shaping nature to the will of humankind falls, at least in the United States, under the melioristic ethos that current conditions can be improved and should be improved. In 1845 this ethos was expressed as “our manifest destiny” by the journalist John L. O’Sullivan. It also fits into the values of the European Age of Enlightenment, rationality, the belief in progress, scientific and mathematical inquiry, and technological invention. Fuller and Lipinska declare that humankind must ground itself in this ethos. Yes, there will be mistakes and unintended consequences. Social unfairness will, of course, be a side effect, but that can be mitigated. In fact, Article 15 of The UNESCO Universal Declaration on Bioethics and Human Rights stipulates that society as a whole, and all nations in the international community, must be provided with new diagnostic and therapeutic modalities or products of research, and have access to scientific and technological knowledge. Because of Manifest Destiny the less than salient forces of greed, brutality and destruction were unleashed, but it was in service of grasping the future and
making it subservient to the will of the United States’ citizens, and therefore in the thinking of that time better. It, the mission, thus was able to gain the status of moral ideal that created an ethos, within which both intentions and conduct could be assessed. Two premises exist in the proactionary mindset, the natural one which says that humankind are products of evolution, and the other is supernatural, that humankind is destined to break from the natural evolutionary strictures and create its own ways of being. Fuller and Lipinska are fighting for the latter.

1.4 Designing Progeny

This is not the late 19th early 20th century kind of eugenics which were strategies to weed out what the dominant society regards as undesirable genetically, and in other ways, in a community or in general in humankind. It will not lead to ethnic cleansing or genocide. It is not about, restricting immigration or marriage, neither is it concerned with social segregation of any kind. This new sort of eugenics is positive. It seeks to encourage persons with desirable traits to produce progeny, to provide ways for progeny to be born without genetic abnormalities, and to provide for the enhancement of future progeny. What follows is an overview of new technologies that can assist in reaching this goal.

1.4.1 PGD, mtDNA

Siddhartha Mukherjee makes note of the fact when the advent of gene therapy in the 1990s changed the equation; genes could now be intentionally changed. This could allow for new or positive eugenics, in which the aim would not be to eliminate people with genetic defects, rather the aim is to eliminate the defect. Three techniques have been developed to do just that, preimplantation genetic diagnosis, mitochondrial DNA therapy, and clustered regularly interspaced short palindromic repeats.
Preimplantation genetic diagnosis (PGD) is possible because of a particular human embryological idiosyncrasy. In the in vitro fertilization (IVF) process the embryo is grown in a nutrient rich solution, inside an incubator, growing into a blastocyst. Eight to sixteen cells form, usually after three days. If, at this stage, a few cells are removed the remaining cells will divide and fill the space those removed cells left. The embryo will continue to mature undeterred. It is at this stage that the embryo can be biopsied and tested for defects. Those embryos that are free of defects and most likely to have the desired attributes can be implanted in the natural mother’s or donor womb. This process can be modified so that a woman’s oocytes could be genetically tested before they are fertilized. From a moral standpoint if desired embryos are selected for implantation, and the others are cryopreserved, whether for a different purpose or not, then ethical concerns can be allayed. The trouble comes when the other purposes are determined. The embryos may not have been aborted in the initial rounds, but they could later be used for experimentation, or destroyed.

Mitochondrial DNA (mtDNA) is present in and unique to the mitochondria. It has been used in experiments by Shoukhrat Mitalipov on non-human primates to ascertain if it had any therapeutic use, but was banned for human experimentation in the United States. Because of this Dr. Mitalipov had to team up with Chinese and South Korean laboratories to do further research. mtDNA research has been controversial because it involves what is known as three-parent embryos. The process involves removing the nuclei from an ovum of one woman, placing it into a donor ovum, to be fertilized with spermatozoa. Ultimately, a child could be born from these three “parents”. Any progeny from this blending would possess DNA from all the parents. The ethical question to be tackled is who are the child’s parents. Are ALL THREE of them, or is it just the two official people who are the legal parents?
The function of this mitochondrial replacement technique (MRT) is to prevent the transfer of mitochondrial genetic defects like Tay-Sachs, and sickle cell anemia to future progeny, usually when both parents have the necessary undesirable traits. Traits like those named above, as well as Kearns-Sayre Syndrome and Leber’s hereditary optic neuropathy tend to be the result of deletions. The case of Charlie Garde, he was diagnosed with mtDNA Depletion Syndrome, is a highly illustrative example as to why this line of research is being pursued.

1.4.2 Cloning and CRISPR, Directed Evolution

In 1961 John Gurdon, an University of Oxford graduate student, used a beam of ultraviolet light to cut the nucleus of an unfertilized frog ovum, while leaving the cytoplasm intact. He inserted the nucleus of the adult frog’s ovum into an empty ovum, and in due course functional tadpoles were born. They carried a perfect duplicate of the donor frog’s genome. This could be considered to be the moment human cloning became a possibility.

It was Ian Wilmut’s 1997 cloning of Dolly the sheep that really turned the world’s attention to the subject of cloning. It was not just because a sheep had been cloned. The real innovation was that a somatic (non-germ) cell was used in the process. The reporting by journalists on this innovation led to talk of people cloning themselves, having progeny that were really their twins. Jane Maienschein sums up the shock by writing that the “child is not supposed to be the brother of the man”. Science fiction was true all of a sudden. The limits could readily be exceeded. Even Wilmut is quoted as saying that it would be sad if the procedure were used to clone people. In the New York Times Gina Kolata and Michael Spectre referred to cloning as “A New Creation”.
By 1997 the default response, at least from governments was that human cloning should not take place. John Gurdon, in an interview with Paul Knoepfler, mused that anything that is done to alleviate suffering or generally improve people’s health will be embraced by the public, and if cloning could somehow be useful to people, and/or solve some problem then it would also be embraced.\textsuperscript{96} He further said that he could see no positive outcome for human cloning unless the resulting abnormalities were fewer than natural reproduction, and that as a process it was well developed.\textsuperscript{97} In August of 2000 legislation was introduced in the British Parliament to allow research on cloned human embryonic cells, while prohibiting outright cloning of persons.\textsuperscript{98} In the United States the report of the President’s Council on Bioethics, called Human Cloning and Human Dignity, made the majority recommendation that cloning-to-produce-children be banned, and that there be a four year moratorium on cloning-for-biomedical-research.\textsuperscript{99}

Cloning is a primary form of directed evolution. In the opening voiceover for Star Trek: The Next Generation, Captain Picard recounts the continuing mission of the Starship Enterprise, the final tenant of which is “to boldly go where no one has gone before”.\textsuperscript{100} Certainly cloning fits that bill, as does all the other forms of genetic and technological enhancement. The point is to transcend the boundaries of nature, to be proactive, to direct how we as humans evolve from this era forward. As Ray Kurzweil states the obvious that technology is a double-edged sword bringing both advantages and dangers, he and other transhumanists argue that the unknown is worth the effort.\textsuperscript{101} Citing Bill McKibben’s argument that humankind has advanced enough in technology, and that humankind should end its march toward greater innovation, Kurzweil cries NO!. Some relinquishment is necessary, but relinquishment of evolutionary progress is not. The fact that so much suffering of all kinds remains, and destruction of the environment the evolution of humankind and the progress of technology are imperative. Technology can help us alleviate
the suffering and mitigate environmental harm.\textsuperscript{102} The assumptions made by those advocating relinquishment assume that the dangers are to be weighed over against the current state of affairs, not against what will be the situation at the time they are fully realized.\textsuperscript{103}

This leads us back to the assumptions that enhanced humans will by definition be a danger to the unenhanced. The BGI Cognitive Genomics Groups has as its philosophy that Chinese parents should have the best children that they can have.\textsuperscript{104} China and India seem to be more receptive to simple eugenic programs like aborting fetuses with defects, and sex selecting in favor of boys. Thus, China and other Asian nations will more than likely be where the boom in enhancement technologies will take place.\textsuperscript{105} Their restrictions on gene-editing tend to be more guidelines, hence CRISPR-Cas9 was used in 2015. Because of their system of government, in the Peoples Republic of China officials can promote scientific innovation with minimal regard for public opinion. For example, since genes that promote violent tendencies have been found, Chinese officials can push the narrative that knocking out those genes will lower the crime rate, and experience little opposition.\textsuperscript{106}

China’s progress in this area could lead to China surpassing the West in athleticism, intellect, social harmony because of a lower crime rate, greater health, etc. Fewer birth defects could, of course, lead to longer lives. China could indeed become the best in the world! These technologies were developed in the West, so the question comes will it be China or the West that boldly goes where no one has gone before. China seems to have chosen to direct human evolution rather than relinquish progress.\textsuperscript{107}
1.5 The Case of Alassane Marius

In Dariusch Atighetchi’s book on Islamic bioethics he makes a point of citing Muslim scholars such as Ibn Khuzayma, and Ibn Maya in making the case that medicine and remedies (drugs) are not a negation of the power of God. They are, even if it is believed that things are more or less predestined, a part of the predestination, not a contradiction of God’s will. In fact, in no religion is the use of medicines, or the practice of medicine considered unrighteous, or something not to be pursued one of the questions this dissertation seeks to answer is not simply whether the practice of reproductive medicine should be acceptable, but also if it does become acceptable what would be the correct ethical protocol if an exemplar of the fulfillment of designed progeny presented at a hospital for treatment.

By the year 2040 all alternative forms of making babies is legal, and the laboratories that provide these services are doing bumper business. Cloning is no longer limited to the therapeutic variety, and over two thousand cloned children are now living among us. CRISPR-Cas9 and TALEN technology are being used not just to turn off undesirable genes, but information is being added, (all sort of information), that expresses itself in iridescence and unique skin colors, polyphonic tones in speaking voices, the ability to regrow severed limbs, etc. The way fat is stored, indeed the inability to store excess fat has been modified so that obesity is not possible. Bonobo and human gametes have been successfully combined and carried in human wombs, from which are born chimeras . . . true hybrids. The eye color spectrum is wider, and the sight is stronger, clearer and more accurate. Gametes are chosen from donors possessed of greater intelligence, and an expert program has been developed for postpartum enhancement of this intelligence starting thirty days after the child comes home. These children are also given constant access to psychological testing and counseling, as are their parents, so that any psycho-
emotional problems can be anticipated and dealt with as soon as possible. These new kinds of families, extant because of new kinds of children, form a loose community, supporting and celebrating one another.

From here a case study can be one to illustrate what should happen when such a person goes into hospital for care. Alassane Marius goes into the Cleveland Clinic presenting with the symptoms of an acute viral infection. There is some concern among the resident physicians that the infection might be bacterial instead. Alassane is rather androgynous, over six feet, eight inches tall, with curly silver hair and acutely aquiline features. Because Alassane is running a fever his sea-green skin is bioluminesing in waves, and his eyes are flashing from violet to emerald, and he is hypersensitive to artificial light. There is a fever and when he speaks most of the polyphony is missing from his voice, leaving a flat monotone. Alassane is twenty-seven years old, and he managed to call his parents and sister Armana. His parents arrived about a half hour after him, and to the clinical staff they appeared to be normal biracial (African and Asian) people, but his thirty year old sister with her burnt umber iridescent skin, jet black hair and violet eyes cause several staff members to do a double take. She’s his height and the staff notes that she speaks as though she is singing. The staff stumbles through trying to ascertain gender. (They didn’t ask Alassane.) A nurse assumed from his manner of speaking that he must be under the influence of alcohol or some drug, again they never asked him.

Alassane’s parents are immigrants to the United States, from Senegal and China respectively. They do speak English fairly well. Like her brother Armana was born in Chicago and is very Americanized. The staff preferred to speak to Armana, rather than her parents, and often acted as though Alassane was barely present. The staff acted as though he did not have decisional capacity. The assumption was prompted by his “dead” way of speaking, the
judgment that he was “under the influence”, and his reticence to answer questions. His 200 IQ could not be observed, and because none of the residents had ever dealt with this kind of person, they did not know that he was aware of what was being said and its implications. He understood everything very well. This was a clear breach of the clinical staff’s obligation to respect their patient’s autonomy, his right to make his own medical decisions and have those wishes carried out.\textsuperscript{110} He possessed decisional capacity and was legally free to exercise it.

Several tests were ordered, and while they were waiting for the results the fellow decided that now was the time to alert the attending physician who was in the hospital. The fellow was fairly sure that the manifestation was respiratory, perhaps a type of flu. He had read somewhere that different sorts of humans tend to overreact/over-present even with the mildest infection. He had already indicated that to the sister. He was also sure that the attending physician would concur, the tests would confirm what he thought and everything would be fine. The disposition of this case can be found in chapters eight and nine.

\textbf{1.6 Narrative of the Subsequent Chapters}

The ultimate aim of this work is to bring together Asian in the work of such philosophers as Ida, Shimazono et. al., African (in particular the work of Chuwa, and Osuji), Principlism, feminist, environmental and critical race ethical strands of bioethical standards to construct a paradigm that can guide scientific and medical professions when they encounter transhumans in their institutions, and research studies. Finally, using the example of genetically modified humans, it will illustrate the proper application of this appropriate paradigm. A narrative of the subsequent chapters follows.
The first chapter is called “The Feminine and the Other: An Introduction to Transhumanism Through Science Fiction”. In the television series Star Trek: The Next Generation Captain Jean -Luc Picard and his crew encounter for the first time the cube ship of cybernetically enhanced species from various galaxies, who assimilate members of species they encounter into a community hive.\textsuperscript{111} The assimilated humans that are part of the Borg are people, but they have been enhanced with high tech prosthetics. Their queen has a humanoid head but is cybernetic everywhere else. The Borg exist to acquire more knowledge and expertise. They engage in conflict and violence toward those aims. Fully carbon-based beings like the Enterprise’s crew are to be assimilated into the hive without regard to respecting their autonomy. Doing so will avail their unique abilities and knowledge to the entire collective.

This outcome can be seen as be an alternative version of Nick Bostrom’s AI Takeover Scenario, in Superintelligence: Paths, Dangers, Strategies.\textsuperscript{112} Instead of the Terminator movies’ bleak genocidal machine-world, through programming uploaded into satellites and/or the International Space Station, the cybernetic Borg Queen with DNA is a threat, but rather than annihilating the human species, and others on different worlds, she decides to assimilate and enhance them so as to be able to use them for her maintenance and mission.\textsuperscript{113} The Terminator version of AI Takeover and its primal instinct to destroy is a decidedly masculine construction, and thus fits perfectly with the precautionary mindset that is supportive of only the mildest forms of enhancing humankind.\textsuperscript{114} The Borg, ruled by their Borg Queen, seeking to bring others into her community and assimilate them illustrates the feminine instinct for nurturing and including diverse strengths. This monster’s female instincts, minus the coercive manner in which she them carries out could be interpreted as a positive. Tudor Balinisteanu places this in context in her article in Feminist Studies.\textsuperscript{115} . The 19\textsuperscript{th} century British writer Mary Shelley’s book about Dr.
Frankenstein’s creature, is where I will begin this exploration of science fiction’s contribution to what people envision when they think of transhumanism. Unlike the Borg Queen who uses appropriation to create new hive members, this female, at least in her novel, had a man do what was in this case the re-creating of a being from diverse pieces.

Of course, Mary Shelley knew nothing of cutting edge genetic or other technologies, yet her expansive novel Frankenstein: Or The Modern Prometheus (originally published in 1818), in some philosophical ways foreshadowed these things. The book can also be seen sociologically, exploring the theme of otherness. In nineteenth century Britain people of African and Asian descent were considered different so different that a lot of people did not view them as exactly humans. They were something other. Post-humans or transhumans will be different, infact Frankenstein’s creature is literally post-human. Could being treated with compassion and humanity have allowed for different results for the characters in the novel? This chapter will not attempt to answer that, but it will explore Frankenstein’s creature as an agent of fear, and the doctor’s drive to push science in light of enhancement technology and transhumanist thought. Through a survey of academic literature, about the Borg and Frankenstein, I will explore two themes. While the Borg Queen symbolizes the feminine in the collection of knowledge, Mary Shelley, through her Dr. Frankenstein, pushed forward with the proactionary imperative to create, using science rather than pure art, and through her monster she shows us the dangers of othering those who are different. After the cybernetic Borg queen, and Frankenstein’s creature cloning will be the final process treated. They are examples of appropriation and re-creation when it comes to human enhancement. Now I will examine duplication as a means of enhancement through the series Orphan Black.
Our jumping off point is the writing of Gregory Pence, professor of philosophy at the University of Alabama, who is in the United States a leading voice in advocating for the process of cloning. Gregory Pence can be said to be a crusader for cloning, and because of Orphan Black, a series that ran on BBC America, cloning as a topic has again entered the public consciousness. In this television show Dolly is a sisterhood of genetically identical young women who encounter a plethora of dangerous situations. They are actually patented products, and have people who are strategically close to them to monitor them and report back to a biomedical corporation that holds the patent. They come from the same set of ovaries…from a chimeric donor and through six seasons the viewer will watch their sojourn, and those of their clone brothers. One of them considers her sisters to be little more than lab rats, and she seeks to be the head of the corporation.117 The question arises as to whether these obvious human beings should be patentable. They are human and they are other. If they are other do the rules of principlism, and any other current bioethical regime apply to them? Ultimately, the sisters of Orphan Black, Frankenstein’s creature and the Borg and their queen are just a continuance of the negative stereotypes of transhumans in the science fiction genre.

This chapter will examine the questions that are raised by these examples, and relate transhumanism to positive attributes, the concept of othering people, and whether humans of any kind should be patented. I will cite the general arguments both anti and pro enhancing humankind, en route to developing, in the greater dissertation, an appropriate bioethical paradigm for medical treatment of enhanced humans and their participation in biomedical research. Further, the Proactionary Manifesto of Fuller and Lipinska will be explicated.118
A justification of human directed human evolution is found in the second chapter: “The Ethical Justification of Transhumanism”. Human enhancement refers to the scientific and technological developments that are and can be used to prolong human lifespan, and to maximize human health and/or intelligence. Developments like CRISPR/Cas9, nanotechnology, cyborgism, transgenic experimentation and cloning, have either been prohibited or are being employed now in the health and intelligence arenas, feared and to a certain extent embraced by humankind. These new discoveries are means to the end improving of humankind. They are mechanisms of the further evolution of homo sapiens, in this instance the evolution is entirely driven by the species homo sapiens itself. Man is the catalytic factor in and fabricator of the process. The manufacture of this new species can happen through an amalgamation of nervous/computer wiring, mechanical implants, transgenic experimentation, genetic editing and nano-infiltration.

The development of these technologies has spawned a philosophical and, in some ways, quasi-religious movement called transhumanism. In this movement human enhancement becomes the means of evolving, in conjunction with changes in the natural and technological environments in which the species lives, ultimately moving toward the singularity where humanity and technology will become one. The feel of science fiction that one may get from transhumanism is what has caused people to both fear and be intrigued by the evolution that transhumanism represents. The fear is that transhumanistic experimentation will lead to Dr. Moreau’s island and Huxley’s brave new world, run by neolutionists (rather sinister characters from the television series Orphan Black). The intrigue is simply about the possibilities that are open to humankind. In this chapter both the genetic strand of human enhancement and the transhumanist movement will be examined. I will also address the underlying assumption that prompts the questions- Are humans playing God, and Is man the epitome of creation- with an
eye toward insisting that the goals of human enhancement are overall positive ones. This will not be done from a spiritual point of view. This is solely a philosophical argument, and one based upon the new types of scientific technologies available to enhance the human species.

Chapter three, which deals with the concept of superintelligence and the need for human morality to be enhanced is entitled, “Superintelligence and Moral Enhancement: Bostrom and Savulescu and the Development of an Ethical Basis for Natural and Posthuman Interaction” Biomedical ethics concerns itself with questions such as what the rights of the patient both in hospital and within research studies are, what researchers and medical staff owe these patients and the advancement of science and medicine, and what society must do so that the rights of patients and research participants are protected and the science and medicine are advanced. If we put transhumans into the picture biopolitics enters into the discussion because these transhumans will live with natural/normative humans, and as was discussed in chapter two transhumans will be different, so different that some normative humans will see them as something other. Just what should their rights be? Will they be better rather than just different, and if so how should natural humans live with them? The theories of Max More, Natasha Vita-More and Ray Kurzweil are often the prominent voices heard on the question of the desirability of progress toward the paradigmatic shift in enhancement that the term transhumanism suggests, and the philosophical field that transhumanist scholars seek to explain and promote. However, this chapter will concentrate on the writing of two distinct voices Nick Bostrom and Julian Savulescu. The former tackles the question of whether intelligence enhancement can happen, and if so how. The latter says that before transhumans join natural humans on this earth some serious moral enhancement is necessary.
In his book Superintelligence: Paths, Dangers and Strategies Bostrom defines and explains what superintelligence is and what it can lead to. Though he acknowledges that endowing the individual human with this sort of intelligence is not yet feasible, he goes on to ask the questions what we owe to and can expect from super-intelligent beings. In other writings he argues the desirability of being posthuman (another term for transhuman), and tries to assess why enhancements have not happened organically.

Julian Savulescu, in his book written with Ingmar Persson, Unfit for the Future: The Need for Moral Enhancement argues that humankind must undergo moral enhancement because the current system of morality is inadequate to the current task. This has to be done even before transhumans make their appearance. He undertakes to address the bias in favor of humans as is, and that prejudice in light of what will be needed when enhanced humans are a regularized population. What are our obligations to people who aren’t human in the same way that we are today? That is his central question.

Various writers in the field of human enhancement tend to disagree with Bostrom’s and Savulescu’s generalist theories. They tend to disagree with specific kinds of human enhancement while being advocates for others. Objections range from germline editing of human genes to independent (autonomous) artificial intelligence are objected to by various writers, whether from fear or religious belief they confront ideas that they see as diminishing the specialness or sanctity of humankind. Both Bostrom and Savulescu seek to clarify the fact that human enhancement is not a challenge to God, nor should it be a source for fear. They begin to lay the groundwork for an ethics for dealing with enhanced or post-humans. In this chapter I examine Bostrom’s superintelligence theory and will interrogate it using the work of other ethicists. Finally, I will
treat Julian Savulescu’s work suggesting that humans are in need of moral enhancement before we go fully into other forms of enhancement.

“Ethics of Genomics Regarding the Possibility of Designing Babies” is the third chapter and it takes a deep dive into procreative technologies and the ethical issues associated with them. New technologies and therapies that allow for the performance of prenatal surgery, the modification of the genetic coding of blastocysts, and the possibility of cloning of individual persons has raised the question how much control potential parents should have over the attributes of their offspring. Prenatal surgery has given babies with debilitating conditions the chance of a normal life because the natal barrier is able to be breached. If heart and other organ defects are found they are now correctable, and the natural further development of the fetus can assist in the healing process.

Genetic technologies open the door for therapy even wider. Amniocentesis, which uses a needle to draw out amniotic fluid to assess potential fetal abnormalities can be seen as the first prenatal intervention that gave parents the ability to choose whether they wanted to bring a child with genetic defects into the world. The potential offered by genomics exponentially increases this ability. Located within our genes DNA, along with RNA are the bits of amino acids that allow genes to create us. The development of mitochondrial replacement techniques (MRT), both spindle transfer (ST) and pronuclear transfer (PNT) was spurred by mitochondrial DNA (mtDNA) diseases, such as myoclonic epilepsy with ragged red fibers (MERRF).

Like the mitochondrial techniques cited above, preimplantation genetic diagnosis (PGD) and CRISPR-Cas9 technology are both further expansions of amniocentesis in that they search for and in MRT, and CRISPR-Cas9 eliminate abnormalities in the genes of blastocysts before they are even in the womb. What the natural conclusions of these therapies ill be is where fear
has begun to grow in people’s minds. Will what they produce even be human and does the child have three biological parents if eggs from two women and one man are used?

If cloning is added to this mix then monsters are imagined: the Borg, Frankenstein’s creature. Television shows like Orphan Black show mostly agreeable clones. (The neolutionists are the evil ones.) Still, the United States and other governments have banned the cloning of human beings. CRISPR-Cas9 technology and MRT were banned for a time, but because of earlier scientific testing, and the potential for disease prevention regulations have been relaxed and open trials were conducted. I will explore all of these technologies and therapies in this chapter, and the ethical concerns that accompany them. Transhumanism, the philosophical concept under which these technologies fall because of their ability to potentially affect the germline of homo sapiens will also be explained. A justification of transhumanism has been explicated in chapter three.

Whether new medical technology is a benefit or harm to humankind is examined in chapter four: “An Ethical Analysis of Beneficence and Non-maleficence to Guide Emerging Medical Technology”. Beneficence and nonmaleficence can be said to be among the underpinnings of any bioethical regime and they are two of the primary tenets of the bioethical theory of principlism. Simply put they derive from the concept of common morality, which says that without an overriding, justifiable reason one should not kill or harm anyone, or deprive anyone of their freedom or desires. There are other parts to this theory but for the purposes of this chapter the above will be sufficient. In this principle Beauchamp and Childress expanded the basic concept that is widely attributed to the Hippocratic ethic “first of all, do no harm”. This is not exactly what the oath says. The original Hippocratic Oath has medical practitioners pledge the use of dietary regimens to benefit patients, and to do no harm or injustice to them. 127
In 1979 the landmark Belmont Report was published in the Federal Register, and in that report respect for persons, beneficence and justice were only three principles enumerated.\textsuperscript{128} Beauchamp and Childress in their seminal paradigm break the second Belmont tenet into two faces beneficence and nonmaleficence. This chapter will explore, in depth, beneficence and nonmaleficence, giving a general definition of both principles, and will only briefly touch on respect for autonomy and justice. These principles bleed into the principle of justice when they are applied to the macro concerns presented by the newest medical technologies such as immunotherapy and genomic-based medicine. It will show how they are to be employed at both the individual and macro levels, moving on to the international attempt to widen the application of these principles as put forth in Article 4 of the UNECSO Universal Declaration on Bioethics and Human Rights.

Only after this groundwork has been laid will this chapter move to an explanation of immunotherapy, genomic-based medicine and genomic/technological driven reproduction, and the application of beneficence and nonmaleficence to these medical technologies. This chapter will treat the subject, for the most part, from the standpoint of reproductive technologies because it is the greatest controversy surrounding this issue. The Buddhist and Hindu concept of Ahimsa, the concept of Ren from the Confucian tradition, and the African concept called Ubuntu, all from communitarian societies will be interrogated in relation to assessing the value of the unborn, ethics to reproductive technology, and reproductive technology as a community benefit. Three non-Western bioethical principles will be employed to demonstrate how nonmaleficence/beneficence can be used in the widest manner. They, though foreign to Western thought, contribute to the universality of beneficence/nonmaleficence. Finally, because of their
salience in micro-cellular engineering, synthetic technologies as a whole will be assessed as a net positive for both the individual and the greater society.

Chapter five, which is called “An Ethical Analysis of Justice to Avoid Exploitation of and Discrimination Against Vulnerable Populations”, concerns how vulnerable people and populations are treated, and how the principle of justice should be practiced in reference to those who are vulnerable. Issues ranging from Jim Crow legislation, the U.S. version of apartheid, and full political rights, to educational access and personal racism were being tackled from roughly 1941 through 1976 during the Civil Rights Movement that took place in the United States. One by one these issues were fought through and, in many ways successfully resolved. President Kennedy issued an executive order that affirmative action was taken starting to correct the wrongs of the prior two hundred-plus years, that happened to people of African descent in the country. That mission became a policy program of the same name that included gender and other ethnic groups.\textsuperscript{129} Even with the substantial effort that was made in those years African American, Indigenous Americans and lately Latino Americans are, according to socio-economic statistics, the most disadvantaged racial/ethnic groups in the United States in 2017.

There is a problem that lingers after all the progress that has been made. It is in the area of medical services. Whether or not the bias is conscious prejudice and bias is a factor in medical care, according to the results of a study by Marie Plaisme et al. Their study concerned the delivery of cardiac services to African American men.\textsuperscript{130} A study by A. M. Morris et al found that African American patients are not referred for advanced cancer treatments at the same rate as white patients.\textsuperscript{131} When it came to pediatric care Jeffrey Gerber et al, found that African American patients were prescribed the appropriate antibiotics with less frequency.\textsuperscript{132}
Especially if the patient is a member of a racial, ethnic or lower socioeconomic group, the level of educational attainment accounts for ineffectual communication between doctors and their patients.\textsuperscript{133} How information is distributed to patients and their families is very important. The lack of specific information written or disseminated in culturally and linguistical appropriate forms, along with a general lack of availability of medical clinicians is another factor in healthcare disparities.\textsuperscript{134} Still, the looming factor of bigotry, both within the medical system and the larger society is a seminal, within the United States, reason why these differences in health rates exist.\textsuperscript{135} Also in the U.S. cost is the other major factor determining the quality of medical care one receives. It is a nation where access to health care is linked to ability to pay, and anyone who lacks private insurance is at a grave disadvantage.\textsuperscript{136} Low socioeconomic status or poverty has an attendant cost. The poor lack the ability to access healthy whole foods and this works against the effectiveness of prescribed treatments for chronic diseases, like diabetes and hypertension. This can be used as a reason for clinical staff say that these patients are noncompliant or irresponsible.\textsuperscript{137} All these factors contribute to the vulnerability of these minority communities.

African Americans are a prime example of a vulnerable community. As a group they are still subjected to discriminatory treatment in all spaces in society. Strides have been made but African Americans remain a group with only marginal power in the U.S.. The current wave of evident examples of police brutality show that at any time the community can be attacked by agents of the state. This being subject to harm at any time is part of the definition of vulnerability. After the 2008 great financial recession the wealth gains of the last thirty years in the African American community have been reversed.\textsuperscript{138} The psychic wounds of racism, and the
above cited statistics about health outcomes illustrate the disadvantaged position of this community.

I intend to discuss thoroughly what vulnerability is, define it and explain the dimensions thereof, referencing the work of Hank ten Have and others. My contention is that in the 2040s enhanced persons will be few enough in number to be considered vulnerable, because of the fact they are not like normative persons, and like African Americans will be subjected to bigotry based upon the fact that they are enhanced, their enhancements and other criteria. Article 8 of UNESCO’s UDBHR, “Respect for Human Vulnerability and Personal Integrity” will be treated in relation to Beauchamp and Childress’ principlism regime’s principle of justice with emphasis on the subject of justice for the vulnerable in health care policy and practice will be undertaken.

The final two chapters are concerned with the subjects of this dissertation, enhanced, post or transhumans, and how they should be treated when they are hospitalized or participating in scientific studies. The first is chapter eight entitled “The Principle of Particularity”. In these final chapters we are in the year 2040 and the new species of enhanced, post or transhumans is a fait accompli. The evolution of humankind has in some cases been directed by humans. In a manner of speaking the imaginations of science fiction and fantasy writers have been proven true. The wild, outlandish predictions have not come to fruition, but there is enough of a difference within these new people to draw notice. Of course, there is objection from politicians and secular entities. Objections to this evolution have come also from those of particular religious beliefs, and those who hold a secular precautionary worldview. People who see genetic engineering as their only way to become parents are ecstatic about the these new possibilities. Another point of view is that of philosophical transhumanist who see this advancement as the dawning of a new horizon. They subscribe to the belief in what Blake referred to as the “golden amour of science”,

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and therefore they, at least as far as human evolution is concerned, can rejoice that “the dark Religions are departed and sweet Science reigns”.\textsuperscript{138}

In November of 2018 Chinese scientist He Jiankui, an associate professor at the Southern University of Science and Technology in Shenzhen, China, announced that he used the CRISPR-Cas9 technique to modify the genes of twins, protecting them from HIV infection, and that he had “deliberately evaded oversight”.\textsuperscript{139} Xu Nanping, China’s vice minister of science and technology, after the uproar this announcement caused, said that the ministry opposed the experiment and ordered that it be suspended.\textsuperscript{140} However, the genie has been let out of the bottle and the opening of the age of transhumanism is China doing. In the world of 2040 in which the hypothetical case we will analyze takes place, artificial intelligence is a technology in which China leads the world, and human directed evolution has led to China’s being the country where the largest number of transhumans live. People who want “the best” in enhancements for their blastocysts and/or themselves come to China as medical tourists. It is not just for cheaper procedures, organ transplants and baby adoptions anymore.

As a result of this progress we now have a generation of transhumans who are functioning in various societies worldwide. In this chapter we will return to the case of Alassane and his family in light of the dominant principlism paradigm. Under the general rubric of compassion people will say that people like Alassane are entitled to hospital care, and that they should be properly treated. But will a fellow feeling, the root of sympathy from which compassion evolved, be enough to ensure this to people who are something different from the normative person? Will the clinical staff have enough of this fellow feeling to act in the best interest of the patient as they are tasked to do? The fellow feeling will not be enough. Though something will be missing compassion can be enough to cause the staff to act in the patient’s
best interest. I will, therefore, argue that beneficence and nonmaleficence, which are just both sides of the same coin, are good, but from them proper treatment of enhanced people require a principle called particularity. In this principle the central concept is that the enhanced person must be treated in a manner that is consistently informed by their enhancement. Even if the ailment is not located within the enhancement itself that enhancement must be taken into account during diagnosis and treatment. If an ailment is normative in origin, i.e. manifesting as it would in a normative person, the enhancement must be taken into account during diagnosis, and must figure in treatment and therapy. The specific enhancement/s are integral to the patient and therefore diagnosis and treatment is only properly done when the enhancement is integral to the diagnosis and subsequent treatment. These new kinds of people are different from normative people, and they may also be different from each other. I will show how this principle does or does not work when Alassane Marius is admitted to the hospital.

The final chapter, number nine deals with my idea that transhumans will be persons, not like everyone else, but persons nonetheless. The chapter is called “The Principle of Intrinsic Personhood”. In his book The Synthetic Age: Outdesigning Evolution, Resurrecting Species, and Engineering Our World Christopher J. Preston writes, “Whoever you are – a scientist or painter, a farmer or philosopher, a young mother or wrinkled grandparent – radical shift in how you look at the world typically begins with a single moment of awakening. In one instant, something happens that crystallizes a whole set of thoughts and observations into a shocking new realization...At other times, humanity will strike out on a different path, determined to remake the world in a way that improves on what nature had provided.” 141 In the world into which this dissertation is projected enough enhanced, post or transhumans exist so that the enlightenment and paradigm shift that Preston is writing about must happen. In medicine the necessary
enlightenment that these persons were not like other people and, according to the principle of particularity, treating these new persons in direct conjunction with their particular enhancement is an ethical must has to be accepted. Failure to do so is malpractice and this maleficence can lead to the death of the patient. While this is enlightenment, paradigm shift is also a necessity and this chapter will tackle that shift, that these new beings be included in the family of persons.

This shift is the second principle that I see as vital for the ethical treatment of transhuman patients, and that is intrinsic personhood. Simply stated the principle of intrinsic personhood requires that post or transhumans, because they are mainly enhanced members of the species homo sapiens sapiens, they should be given the same level of due care and consideration that normative persons are given.

This inclusion cannot be nominal, and their (enhanced persons) differences must not be peculiarized. To effectuate their being able to be treated with the beneficence and nonmaleficence that is due to everyone who presents him/herself in these situations enhanced persons must be as human as possible, when it comes to medical treatment and scientific experimentation. Othering, as seen in the treatment of various racial, religious, ethnic, sexuality and enablement groups is dangerous. Here I am referencing examples like the Tuskegee Syphilis Study, Nazi experiments on Jews and other vulnerable groups, and the experiments of Japanese scientists on other Asian nationals and prisoners of war during the World War 2 period. It is the my contention that ethics grows more and more these days out of the rubric of human rights because it is most often types or groups of people who are mistreated or othered. Unless the enhanced are not maltreated then an injustice is occurring. Beauchamp and Childress’ principle of justice is applicable here, from the perspective of human rights, in a political or nation state citizens should have the same rights material and utilitarian. Further, just because these
persons are different they should not be excluded from ‘fair opportunity’ in medical consideration and treatment, i.e. they should not be subject to discrimination.  

Alassane’s case and family are a glaring illustration of the great and obvious difference of enhanced persons to normative people. The admitting nurse at the first hospital diagnosed Alassane as being drunk. Accepting the nurse’s conclusion, a doctor agreed with this and took no action at first. The errors continued when the attending physician came onto the case and assumed (diagnosed) influenza before testing was done. All of this was maleficence borne of prejudice and arrogance. This chapter will examine where these assumptions came from and whether they fit into legitimate objection by healthcare staff, as well as how they are the same sort of societal wrongs that greeted other persons that are/were seen as different or inferior. This case, shows why a principle of intrinsic personhood is necessary, even though an overriding principle of justice has been set particularly in the Western world. It is not enough in the case of enhanced persons to just say what is right; it needs to be explained and particularized so that there can be no wiggle-room or confusion. It is not always the case that people, who’s job it is to do the right thing can be depended upon to follow the course of justice.
THE FEMININE AND THE OTHER: AN INTRODUCTION TO TRANSHUMANISM THROUGH SCIENCE FICTION

Introduction

In the second season of the television series Star Trek: The Next Generation Captain Jean-Luc Picard and his crew encounter for the first time the cube ship of cybernetically enhanced humans (and other species), linked in a hive form to a central “queen”, who identify themselves with the simple and chilling complex sentence, “We are Borg; you will be assimilated”. For the rest of the series this Borg became an even bigger nemesis for Picard than the mercurial Q, an impish godlike figure who toys with the Enterprise’s crew for several episodes. The Borg are people, but they have been enhanced with high tech prosthetics. The queen has a humanoid head but is computer and robotic everywhere else. The Borg exist to acquire more knowledge and expertise. They engage in conflict and violence toward those aims. Fully carbon-based beings like the Enterprise’s crew are to be assimilated into the hive. Of course, no effort to respect the autonomy of the perspective hive members is considered, but their unique abilities and knowledge will become available to the entire collective.

This outcome may be the alternative version of Nick Bostrom’s AI Takeover Scenario, in Superintelligence: Paths, Dangers, Strategies. Instead of the Terminator movies’ bleak genocidal machine-world, through programming uploaded into satellites and/or the International Space Station, the queen cybernetic DNA reaches full implementation, but rather than annihilating the human species, and others on different worlds, she decides to assimilate and enhance them so as to be able to use them for her maintenance and mission. The Terminator version of AI Takeover and its primal instinct to destroy is a decidedly masculine construction,
and thus fits perfectly with the precautionary mindset when anything other than the mildest form of enhancing humankind is mentioned.\textsuperscript{136} The Borg, ruled by their Borg Queen, seeking to bring others into her nest, i.e. her community, to assimilate them illustrates the feminine instinct for nurturing and including diverse strengths. Tudor Balinisteanu places this in context in her article in Feminist Studies.\textsuperscript{137} Because this treatise is one that decidedly seeks to affirm the positive nature of human enhancement this monster and her female instincts serve that purpose well. The 19\textsuperscript{th} century British writer Mary Shelley’s book about Dr. Frankenstein’s creature, is where I will begin this exploration of science fiction’s contribution to what people envision when they think of transhumanism. Unlike the Borg Queen who uses appropriation to create new hive members, this female, at least in her novel, had a man do what was in this case the re-creating of a being from diverse pieces. Further on, I will examine duplication as a means of creating through the series Orphan Black, using as a jumping off point, the writing of Gregory Pence, professor of philosophy at the University of Alabama, who is in the United States a leading voice in advocating for the process of cloning.

Mary Shelley knew nothing, of course, of genetic manipulation, transplantation or regenerative technologies, and yet, the necromancy aspect aside, her expansive novel Frankenstein: Or The Modern Prometheus (originally published in 1818), in some philosophical ways foreshadowed these things.\textsuperscript{138} The book can also be seen sociologically, exploring the theme of otherness. In nineteenth century Britain race was a major consideration. Post-humans will be different. (An argument can be made that Frankenstein’s monster, like Dracula, was literally post-human.) Could being treated with compassion and humanity have allowed for different results for the characters in the novel? This chapter will not attempt to answer that, but it will explore Frankenstein’s monster as an agent of fear, and the doctor’s drive to push science
in light of enhancement technology and transhumanist thought. Through a survey of academic literature, about the Borg and Frankenstein, I will explore two themes. While the Borg Queen symbolizes the feminine in the collection of knowledge, Mary Shelley, through her Dr. Frankenstein, pushed forward with the proactionary imperative to create, using science rather than pure art, and through her monster she shows us the dangers of othering those who are different. After the cybernetic Borg queen, and Frankenstein’s creature cloning will be the final process treated.

Gregory Pence can be said to be a crusader for cloning, and because of Orphan Black, a series that ran on BBC America, cloning as a topic has again entered the zeitgeist. Dolly the sheep on this television show is replaced by a sisterhood of genetically identical young women. They encounter a plethora of dangerous situations. They have people who are placed strategically close to them to monitor them and report back to a biomedical corporation that has patented them. Through six seasons the viewer will watch their sojourn, and those of their brothers, who are also clones. They come from the same set of ovaries...from a chimeric donor. One of them considers her sisters to be little more than lab rats, and she seeks to be the head of the corporation. The question arises as to whether these obvious human beings can be patented. If they are not humans, then how are they other. If they are other do the rules of principlism, and any other current bioethical regime apply to them? Ultimately, the Borg and their queen, Frankenstein’s creature, and the sisters in Orphan Black are just a continuance of the negative stereotypes of transhumans in the science fiction genre.

This chapter will examine the questions that are raised by these examples, and relate transhumanism to positive attributes, often referred to as feminine, and the concept of othering people, citing the general arguments both anti and pro enhancing humankind, en route to
developing, in the greater dissertation, an appropriate bioethical paradigm for medical treatment of enhanced humans and their participation in biomedical research. Otherness as a concept and in light of humans that have been enhanced through advances in science and technology will be treated. Transhumanism through the lense of values, masculine or feminine will be explored, as will the concept of people as patentable property. Further, the Proactionary Manifesto of Fuller and Lipinska will be explicated. Women who are often seen as a novelty in the field of technology in the transhumanist movement can move from otherness, to creator and fighter against the forces of commercialization of human bodies.

2.1 Frankenstein

In the second volume of Mary Shelley’s magnum opus, the monster of the modern Prometheus who stole the impetus of creating life from the gods, wails in anger and frustration. He had entered the house of an old man called De Lacey, asking just to sit by the fire for a few minutes. The old man could not see the traveler so he was not horrified by his appearance, but when his son Felix, and two others came into the cottage where the two men were sitting, they were horrified by the creature they saw with Mr. De Lacey. An altercation with Felix ensues and the Dr. Frankenstein’s creature flees. The chapter begins with his lamentation. “CURSED, CURSED CREATOR! Why did I live?” He goes on to interrogate his tormented mind asking why he didn’t just do himself in. As far as he can see his creator assembled him wantonly, just because he could, to see if he could remake a man from disparate parts. Into the forest he went so that he could vent his despair, and vent he did. Yet, he was the only enraged one there. The forest was a place where peace prevailed, from the stars in the sky to the singing of a bird. He calls himself one who is ‘unsympathized with”, and compares himself to Satan through taking his
voice from Milton’s Paradise Lost. This section will explore the body of scientific knowledge the creation of this new Prometheus implies, and his implications for the realm of human rights.

2.1.1 Frankenstein: His Monster as Criminal and His Role in IVF Debate

Galvinism, the use of electricity on the human body, is the process that is used to vivify the assembled parts that make up Dr. Frankenstein’s monster. Alan Rauch, in the essay, “The Monstrous Body of Knowledge in Mary Shelley’s ‘Frankenstein’”, seeks to make clear that the physical creation of this new man is neither a transgression, nor is it repugnant. He posits that for Mary Shelley science’s moral integrity has its legitimacy in the viability of knowledge. Dr. Frankenstein ignored the positive viability of the knowledge that his creation embodied, left off humanity in his treatment of him, and thus turned away from a creature that could be shaped with care and nurturing. The doctor was technically skilled and brilliant in his knowledge of anatomy, physiology and the application of galvanism, the realm of the masculine, but he was woefully deficient in the feminine realm of compassion and care. He saw threat rather than promise. Working in solitude his knowledge and creation had no context and its value was nonexistent, if the purpose of the acquisition of knowledge is to share it advancing the totality of knowledge for humankind. Dr. Frankenstein’s actions undermine the tenets that characterize scientific practice, i.e. application, and dissemination.

All of this led to the pervasive reading of Shelley’s book as an examination of Dr. Frankenstein’s creation as a monster and therefore a criminal. Nicole Rafter and Michelle Brown, writing about the depiction of criminology in the movies in their chapter “‘He’s Alive!’: Biological Theories and Frankenstein”, talks about Lombroso’s criminal anthropology. Cesare Lombroso was a 19th century physician and anthropologist who promoted the theory that cranial and other detectable physical traits could identify criminality. Those with such traits were what
he called “born criminals”.\textsuperscript{143} In it he described criminals as atavisms from an earlier period of human evolution. He notes their darker skin, calling them savages, and going on to describe them as primitive in both morals and minds. He even told us how we could identify them: over developed jaws and cheekbones, low sloping foreheads, oblique and large eye sockets, dark skin, thick curly hair, big ears and a low sensitivity to pain. Then, of course, there are the non-physical attributes like vanity, laziness, absence of remorse and foresight, and flaring passions. Lombroso even talks about born criminals, who are not responsible for their criminality but should nonetheless be incarcerated for life, and because they cannot help their criminality they are the ones to fear the most.\textsuperscript{144}

Now, for Lombroso there were other criminal types, e.g. insane criminals, occasional criminals, pseudocriminals and political criminals, but they have few or none of the physical or attributional anomalies cited above. He theorized during the age of phrenology and was very much of his time. One could see criminality on the face (head) of the person. Lombroso’s criminal anthropology was just the more academized version of this belief. He also believed in scientific racism where civilization and accordingly criminality was located in race and color. The white man was the epitome of civilization and more dispassionate (therefore less criminal) than the others reaching the base of atavism and criminality of the black man.\textsuperscript{145} Criminal anthropology gave way to the feeblemindedness theory. In this theory the belief was that intellectually disabled people were organically criminal and too weak to restrain themselves, and therefore all criminals are feebleminded. With Alfred Binet’s intelligence test sending feeblemindedness crusaders out to test and prove their theory, the program to build and birth superior people, called eugenics, was in full swing, and they advocated a program of sterilizing the feebleminded and other criminal types.\textsuperscript{146}
Rafter and Brown, using the 1931 James Whale film version of Shelley’s story, situate Dr. Henry Frankenstein’s creation within this context. In this version, the monster’s personality comes in part because the humpback servant of the grotesque Frankenstein returned with a brain marked abnormal, from the local medical school. Elizabeth his fiancée, his father, and Dr. Waldman try to dissuade him from his course of playing God. This work is embodied blasphemy, but the Dr. doesn’t believe it and using galvanism, where the electricity is natural (from thunder), he brings his monster to life. (This film creature is not the erudite creature of Shelley’s novel.) After the creature is enlivened the Dr. tries to educate it, but true to his criminal nature the creature rebels, and the decision is made to kill it again. This is Lombroso’s lifetime incarceration taken to a final solution. Though the monster’s forehead is a high one, the monster represents all the physical attributes of Lombroso’s theory. He commits three murders, one unwittingly, half does another and tries to murder Frankenstein himself. The villagers immolate him on a windmill.147

Dr. Frankenstein’s experiment is about creation, making a man, and in that way theorists see him as related to embryonic research. Michael Mulkay goes straight to the heart of the matter. Frankenstein’s new man, the method of whose creation is only hinted at in the novel, represented the Dr.’s attempt to realize systematic, science-based control over the creation of human beings outside of the womb. These test tube babies are now produced on a scale that is commercially viable. This commercialization of the process is one of the ethical conundrums that in vitro fertilization (IVF) has fostered. What the ultimate outcomes of these processes will be cannot be ascertained from just the facts to date. People trying to predict must to some extent speculate. They have to write a story that leaves a lot to factors outside of their control.148 Science fiction has shown that in the arena of science and technology fact can later evolve from
fiction. The lines become blurred. Using Frankenstein as a jumping off point, the anti-rationalist fear is a mad scientist creating something that will run amuck, killing thousands of people.

Mulkay highlights the British public debate, which was sparked by The Warnock Report on Human Fertilization and Embryology published in 1984. In 1990 the Human Embryology and Fertilization Act was passed. The debate could be carried on by (1) mentioning Frankenstein or other science fiction characters openly in relation to the issue being debated, in this case the experimental manipulation of IVF embryos, and (2) debaters can point to fictional components’ presence in the discourse of opposing parties even though their opponents may not have made any explicit reference to science fiction. In the white paper that preceded the Warnock Report Frankenstein was directly mentioned by The Sun, a tabloid newspaper, by way of a photograph. Cloning was prohibited, as was designing babies. Experiments of the type implied in the laboratory of Dr. Frankenstein’s were not only forbidden, but they were not even being attempted. While reporting the facts the paper’s imaging seemed to imply that scientists were villains.149 The second of Mulkay’s points about the use of science fiction in the debate about IVF research was made by an MP in 1984, in the House of Lords. As an opponent of experimentation on human embryos, she referred to Frankenstein’s monster doing many awful things, and moved from that to an invocation of Hitlarian eugenics being used to create perfect people in the UK. From there she moved to a call for people who were not experts in the field, to imposing control on the scientists who would be tempted to go too far.150

2.1.2 Frankenstein: His Monster as Other, and Human Rights

Dr. Frankenstein meets his creation on Mt. Blanc, in the second chapter of the second volume of Shelley’s book. In it his creation begins to recount the events of the quiet life he tried to live since leaving the Dr.’s laboratory. He begins the multi-chapter recitation leading to his
request for a mate, with expressions of his alienation from the society of mankind. He tells the Dr. that he is his creature and ought to be his Adam, but is instead a fallen angel. He says that Frankenstein abhors him, and that the cold dark elements are kinder to him than human beings. He repeatedly says that he is alone and lonely, using the loaded term miserable. The monster of Shelley’s book was not handsome and because of this he was shunned. He does not behave in the expected ways because he does not know those ways. H. L. Malchow interpreted Frankenstein through the lens of the racial imaging in 19th century Britain, in the journal Past & Present.

The monster has brutish strength and size, prominent limbs, yellow skin, ragged shiny black hair, and black lips that contrast with pearly white teeth. He is a threatening Other. This figure is threatening to the bourgeoisie, and whites, because he cuts a working-class figure, and because he is not white. He can climb mountains and trees like an animal, and he takes the harsher elements far more easily than a normal man could. He doesn’t need the usual comforts of the white man, and he is given to both giddy excitement and deadly rage at a moment’s notice. Dr. Frankenstein agreed with his creation to make a mate for him if he and she would leave Europe for good. This bargain was struck in the same vein that the Other should not live among white Europeans. (Blacks had the opportunity to go to Sierra Leone to live as they chose on the continent where they belonged.)

The other main thrust of Frankenstein, unlike making the creature the Other, comes from within the creature himself. He asks his maker for a companion, for the human right to community. His misery (loneliness) must be assuaged with another of his own species. Dr. Frankenstein, though he initially complies with the demand, ultimately cannot let go of the fear of two monsters, possibly with offspring, overrunning normal humanity. He destroys the woman
he has created. The monster wanted to join the community of humankind. At first he had benevolence, he said. Indeed, De Lacey and the others educated him during his time in the cottages. That experience caused him to feel as though he were in an idyll, and that he could live openly amongst the cottagers. The altercation with Felix put an end to that and his benevolence toward humankind.  

Another fact that is part and parcel of the preceding fact, is that the creature demanded that Dr. Frankenstein hear his story. He claims the right to be heard. This hearing – recounting of his story – is to be a kind of case seeking justice. Though he is put together from parts of other men, the creature is a form of human. He then claims the rights of a man and a citizen, - he has Rousseau’s sensibility - the capacity to make a reasonable argument on his behalf. He acknowledges that the murders that he has committed make him an outlaw in human society, but he is not quite human enough for their application to him. The creature does not limit himself to empirical fact, but he goes into an anthropological argument. This is seen by Reese as Kantian, because the creature’s will is not governed purely by reason. His will has the quality of freedom, which belongs to all rational beings. Since he is not strictly human, he is an example of one of Kant’s other rational, finite beings. He stands watching the humans who are observing the law’s formal determination of itself, simultaneously outside and under it. This is an alien form seeking to pursue the happiness of community, possibly creating other alien forms in a human community. Dr. Frankenstein’s creation has refused the othering done to him by both his creator and other humans, and demanded his due as a being. He has declared himself Dr. Frankenstein’s Adam, asserting a right to his Eve.
2.2 The Borg Queen

Laurie Anderson, the 1980s icon of the new wave of performance art saw cyborgs as a posthuman fantasy. She penned a short poem in which cyborgism was a matter of circuitry and sound…beings animated by switches.\textsuperscript{160} IT reads: “Always two things switching/Current runs through bodies and then it doesn’t/It was a language of sounds, of noise, of switching, of signals./It was the language of the rabbit, the caribou, the penguin, the beaver. A language of the past. Current runs through bodies and then it doesn’t. On again. Off again./ Always two things/ Switching./ One thing instantly replaces another. It was the language of the Future”. The Borg Queen was far more, not merely an animated relay casing, able to only grasp the simplest of commands. The Borg Queen was a fully functioning, independently realized humanoid being. Ms. Anderson’s poem was only correct in the sense that she had a body and was the embodiment of the language of the future.

2.2.1 The Borg Queen and Other Goddesses in Otherworlds

While the Borg Collective appears in the “Q Who” episode of the television series Star Trek: The Next Generation, the Borg Queen does not greet the public until the movie, Star Trek: First Contact.\textsuperscript{161} (First Contact will be used throughout the rest of this paper.) Tudor Balinisteanu immediately uses the dichotomy culture (masculine) and nature (feminine) to set up the discussion of the interaction amongst the Borg queen, Capt. Picard and Commander Data. In “The Cyborg Goddess: Social Myths of Women as Goddesses of Technological Otherworlds” he uses Ortner, Harraway, Keller, Daly, Frye and others’ to illustrate this dichotomy and how it played out in the movie. The premise is a simple one: The feminine is wild, chaotic, irrational and untamed. The masculine is that which civilizes, and gives birth to culture, and the scientific and mathematical disciplines found therein. The feminine is something that is always to be
devalued, and it usually is. The idea is that masculine culture, because it is seen as more rational, must transcend feminine nature. This underlies the Western mythology that has fed so much of the drive to conquer “savage” peoples, and the actual earth itself. The Abrahamic religions have at their core the worship of the god, Yahweh/Jehovah/Allah, and his admonition to humankind, because of its being in his image and likeness, to subdue the earth. In the Paleolithic and Neolithic periods the religions before the advent of Abraham were often centered, at least in part on goddesses or earth mothers, and these sought to bring adherents into communion with the earth, emphasizing humankind’s place within the environment. Mankind was not supposed to subdue the earth, but rather mankind was supposed to be one with it. In most instances Earth was equal to Mother.

I would argue that because she is a woman the Borg Queen is therefore the irrational factor of nature, but she also contradicts that because she embodies the rationality of science and mathematics. She is very high tech. Tannsjo, cites Aristotle arguing with Socrates that women show courage in obedience and glory in silence, while Rousseau saw an intelligent woman as a vexation. This Borg Queen would be a vexation to them both. While she is the epitome of cyborg ingenuity her drones which are essentially organic, have that biological foundation operating under the control of the technological prosthetics referred to above. These prosthetics stifle the elan vital, the essence that made the organic beings essentially themselves. They are no longer a single entity, but are drones in a hive. As in a beehive the maintenance of the queen was the ultimate occupation. New workers were assimilated rather than born. Balinisteanu cites Mirzoeff’s observation that though the Federation of Capt. Picard employed engagement and agreements with new worlds, the enterprise was still benign neocolonialism, but the Borg, because of its imperative to assimilate species and planets, in a collective Westerners would find
similar to the Maoist/Soviet collective society of their imagination, was imperialistic and therefore pernicious. Here we have a fundamental apprehension about enhanced beings in general, and enhanced or transhumans in particular. Who or what will they be, and will they become a master race, one that will ultimately enslave us? Certainly, the Borg Queen and her drones seem to be bent toward that end.

It is the interactions between the android Commander Data and the Queen that prove most enlightening. The Queen introduces herself to him as the Borg. Data calls that a contradiction, pointing out the lack of individuality and collective consciousness. The Queen says that she, like the Abrahamic god is the beginning, end, one who is many…the Borg. Both her head and torso are interlocked and she’s standing as a being before Data, so he greets her and asks if she controls the collective. Because he is complete rationality he is confused by the fusion of the irrational (feminine) and the rational (masculine) with whom he is interlocutor. She says that he implies a nonexistent disparity because she is the collective. The plodding humanoid construction of artificial intelligence that is Data, presses to ascertain whether she is their leader. The intuitive amalgam that is the Borg Queen tells Data that she organizes chaos, and he is in chaos because he is machine and wants to be human. She is not in turmoil, he is. Data, who must function within his programming, points out that his programming enables him to evolve toward self-betterment. The Queen says that the Borg are also evolving but toward perfection. It is what the quest is about. Data can only see conquest and tells the Queen so. The Queen explains that the assimilation of other beings brings the Borg closer to perfection. Data questions the Borg’s motivations.

She leaves Data unable to intuit, because she told him that she herself was Borg, and that she herself was the collective. His subjectivity came directly out of the Enlightenment’s socio-
cultural framework that the best social worlds are largely masculine. The natural and technological are mutually sustaining embodied in the Borg Queen. She, as cyborg, is not a part of what Haraway calls the original unity, (fulfillment, bliss and terror found in a “phallic mother” from whom all humanity must escape) of Western humanist sensibility. Nature and culture are both within her, therefore she cannot be appropriated by the masculine. She is a goddess. Who else but a deity would introduce themselves as the beginning and the end, the one who is many? She is deconstructed womanhood, neither chaotic nor unscientific. She is the interconnectedness of culture and nature, empowered and life generating in a cybernetic way. She gathers and nurtures with the will worthy of any warrior hero. She is meant in her being to break the masculine/feminine dualism we have been treating, by being dual in her very personhood.168

Of course, that cannot be allowed to be the case. The Borg Queen has two strikes against her; she is a woman and she is a cyborg. According to Balinisteanu, the men of the Federation experienced what can be seen as an existential crisis. Who was going to have the upper hand; will it be the Federation or the Borg Queen? Technology must win out over the chaos of nature if it is to sustain itself. On the other hand, nature must be able to successfully manipulate technology so that she will be able to assert her power over technology. The meaning in technology will be lost if this cannot happen. She is nature as threat, discontent, a possibly invasive rewriter of the very equations that cause technology to function properly, because it may introduce unsolvable paradoxes.169

That precipitated First Contact becomes another Western hero conquest myth. The Borg Queen is a contradiction. She is transhuman, something that he, Capt. Picard must resolve. Keller would say that the Borg Queen is science re-creating nature, and thus is a spectacle that must be
repudiated. Man is supposed to master the logos (the rational principle governing the universe) and have the keys to the secret vault.170 Woman is the space upon which man’s mastery takes place. In this case, masculine technology is under feminine nature’s control, therefore, it is a threat to the status quo, which is also masculine. Cultural checkpoints must be set up to make the masculine secure. This is simply the fear of the unknown; the feminine power in this position is unknown. Nature, like in the Western ethos, is hostile and must be conquered.171

She is as true a monster as the children born with birth defects to which Glanville Williams referred in the 1950s. The Borg Queen is indeed a being that challenges, or disturbs the presumed natural boundaries that a given society deems sensible.172 The Borg Queen is a goddess in that she says that she is the beginning and the end, one who is many, and in the majorative she says “We are Borg”, speaking as every assimilated one. Annihilation of humans, or any other purely organic species is not her aim. She wishes to assimilate them into a collective. She has a symbiotic relationship with her drones, forming a hive and a new paradigm. The Borg Queen, a union of nature and technology, where nature is still subordinate, assimilates the masculine, making it part of a collective, sublimating the individual. To further otherize her, she isn’t overtly instinctual (feminine), she has a purpose (masculine). She, like Starfleet, the authority for which Picard and the others on the spaceship Enterprise work, seeks to encounter new worlds, like the Euro-Americans in the 19th century she has a manifest destiny to incorporate new lands into her nation.173 This destiny is sinful in that it seeks to form a collective and its goddess seeks to establish a new transhumanistic paradigm.

The hero must sever the human and nature into separate paradigms. Citing Keller, Balinisteanu postulates that the secrets of the logos passed from God to man through science, and thus the hero, in this case Capt. Picard, can be said to be godly in his conquest (destruction) of
the Queen and the Borg. They, or “she”, challenges the powers of God and man. This Borg imperative will result in an abject kingdom ruled by a female, and thus will not be governed by reason. Its goddess queen is a cybernetic evil seductress. She is the focal point of the fear of Bostrom’s AI Takeover Scenario, where in this unique case nature will overtake machine and turn it against humankind, and otherwise the insurrection this goddess queen will cause will breed fear of the technology of mankind, when it is alienated from him or unsuccessful when it confronts nature.\textsuperscript{174} This is a fabula, a fable where the warrior/hero myth stays intact. The Borg Queen and her collective must be destroyed or it will contaminate Earth not only with its climate change and technology, but with its Maoist or Soviet-style collectivism enabled through the female subversion of technology. The female merged with flesh and technology cannot be the holy grail brought back to earth, thus mocking modernity’s fake progressive emancipation, even if we do appreciate the power, energy and possibility the Borg Queen’s being presents to the masculine paradigm.\textsuperscript{175}

\section*{2.3 Cloning (Using “Orphan Black”)}

While the Borg Queen and Dr. Frankenstein’s creature are complete science fiction, Sarah Manning and her unique family are quite plausible right now. In the series in which they appear their peculiarities are played up, and their commercial possibilities are at the heart of their troubles.

\subsection*{2.3.1 Orphan Black and the Patenting of People}

Sarah Manning is a girl among a lot of girls who look like her. She is street smart, resourceful, and suspicious. She needs to be. She is a part of an ongoing field study, testing the viability of clones. Like Dr. Frankenstein’s monster she was created in a laboratory, therefore
she and all of her siblings are, like the monster, uniquely Other. The problem is, she doesn’t know it. She saw her “sister” Beth jump in front of a metro train, and that began her awakening and the discovery not just of her other sisters in the Leda project, but also of her brothers in the Castor project. In the first season Sarah finds out from her sister Cosima that they and any other sisters have DNA tags and that they are patented. The Dyad Corporation, under the Topside Group, is the patent holder. These DNA tags (expressed sequence tags ESTs), along with the monitors assigned to each of the young women, allow the patent holders to tell them apart and gather subject specific information for the field study. All of this presses home that these young women, and the Castor young men are a free-range experiment. They may be Other but can they be patented?176

Gregory Pence is one of the world’s foremost proponents of cloning, and he has written a book about the series Orphan Black through the lens of bioethics. In his book he explains the seminal case when it comes to patenting organic substances. Though the patent laws of the United States do not generally allow the patenting of natural organic elements, the case of Diamond v. Chakrabarty (1980) resulted in a little modification of that situation to wit, if an alteration is made to the genes of a preexisting organism, the organism that results is a “human-made invention”, and as such that result can be patented.177 While Ananda Chakrabarty patented an organism to clean up oil spills, others have sought patents for EST or DNA tags for large sections of human DNA. In some cases, these patentees have not known what these tags influenced in the sections. In other words, they did not know what these tags did, and yet patents were granted.178

The granting of patents is done to facilitate rewarding inventors and scientists for new inventions, to promote the general good, and to facilitate the dissemination of knowledge.179 Of
course, there are those who are absolutely against the patenting of any part of a human being. The president of the Southern Baptist Convention’s Christian Life Commission was an especially strident voice. He saw any experimentation in the realm of genetic modification and/or human directed evolution, as “a revolt against God’s sovereignty and the attempt by humankind to usurp God and be God”. This whole argument is interrogated in depth in chapter three on the justification of transhumanism. In light of what he considers sacred it is very interesting that he chose to describe human beings as “pre-owned”. He further says that human parts should not be sold commercially, and that being able to own a part of a human being is the same as being able to own a whole human being.\textsuperscript{180}

Because one holds a patent that does not mean that any thing or class of things belong to them. Thus, the DNA tag that individually identifies Sarah and her sisters is patented, but none of the sisters are patentable. The right to create copies of them, and/or the process to create the copies are what is owned by the patentee. The process to make another Kira, Sarah’s daughter is also owned by the patentee, as well as whatever valuable knowledge studying her leads to. Further, just because someone has been granted a patent on a particular DNA segment or gene, it does not follow that that patent confers ownership to the patentee of that gene or DNA segment in any or all humans. The patentee has no right to extract that DNA from anyone who has it.\textsuperscript{181}

2.3.2 What is the Definition of Human?

Even though Sarah and her sisters can be said to have been created through a process of embryonic manipulation, they are human beings are they not? They are not products. They have all the functionality and affective scaffolding of human beings that come about through copulation and birth, therefore, what the Supreme Court of California decided in the case of Moore v. Regents of the University of California applies when considering the appropriateness...
of patenting and/or experimenting on them. The court held that civilization’s evolution from slavery to freedom, from regarding people as chattel to the recognition of individual human dignity, demands prudence in regarding human tissue as property.\textsuperscript{182}

Sina Muscati proposes in the Winter 2004 issue of the Journal Jurimetrics a definition of human that would clarify the scope of what could not be patented. The definition includes: (a) whether modified or not any adult human being, (b) whether modified or not any human fetus or embryo at any stage of development, (c) any human tissue or cell that could differentiate into a fully developed human being, including modified or unmodified totipotent embryonic stem cells, (d) a chimeric embryo at any stage of development, (e) a fetus, embryo or higher organism, either animal or human that is made up wholly or in part of tissues or organs from human embryonic stem cells, or (f) any higher organism, fetus or embryo or cell-tissue capable of differentiating into an entire organism, be it human or animal, having genes that are found only in the human species or any other genetic indicator distinguishing humans from other animal species. In this definition human fetus or embryo is defined as an organism formed by human sperm and ova uniting, whether in vitro or in utero, modified or unmodified, and any organism formed through somatic cell nuclear transfer using a human donor nucleus, whether or not the host egg is human or from another mammal.\textsuperscript{183} Using this extensive definition both the Leda and Castor clones are human, as is Kira and the potential offspring of Sarah’s sister Helena. They are the result of the cloning of two stem cell lines found in a single donor, and she, Kendall Malone, is a human being.

\textbf{2.4 Ethical Considerations Posed by the Subjects}

In this section I will make an argument for what constitutes personhood. The word “persons” is placed in quotation marks because the concept of person has to be defined in this section. The
question to be answered is where personhood is located. Is it solely within the physical, or is personhood located in the mind?

2.4.1 Personhood

Because they will be genetically, and/or cybernetically enhanced to a significant degree, post or trans-humans are not or will not be normative homo sapiens, and the literature of environmental, feminist, racial critique and nonhuman ethics will be used to argue for the personhood of the subjects treated in this paper. Are the Borg Queen, Frankenstein’s monster, and Sarah and her sisters’ persons? According to Allan Buchannan’s reading of Kant, personhood entails an inviolability, hence moral status based upon the wholistic body of their humanity.\textsuperscript{184} Cynthia Cohen locates a being’s humanity (essentially personhood), not just in the physical body but also in things like the use of language, self-awareness or consciousness.\textsuperscript{185} Humanity and personhood can be seen as one and the same, but Cohen’s addition of the consciousness of self, use of language, and all of the uniquely human characteristics those things imply drives personhood away from the corporeal-based concept of humanity. Gerald Doppelt then, comes into the argument citing Immanuel Kant, the ethicist John Rawls and others who would say that the moral status accruing to persons is grounded in the rationality, morality and their embodying institutions in human society.\textsuperscript{186}

The centrality of the argument for rationality was made in the treatment of the Borg Queen. She could be said to be the personification of a trans-human being. She is cybernetic, both flesh and machine, and yet she can be said to possess personhood. The argument cannot be made that she is an homo-sapiens. Her flesh, found only on her head, is synthetic and the rest of her is prosthetic. Thus, she is a Borg creation. Her femininity is the salient attribute. Because she is a highly rational woman the Borg Queen and her drones can be said to be the embodiment of a
feminist interrogation of Rawls’ thinking about an equal opportunity society. Gerald Doppelt uses the work of James Sterba to make this argument, particularly his book Three Challenges to Ethics. The Borg are a family without sex roles. (All but the queen are drones.) Assimilated females and males are not given gendered assignments. Thus, Sterba would say that Borg society is Rawls’ equal opportunity society.¹⁸⁷

Though the Borg Queen can be said to fully encompass the characteristics that render one a person, and it can be said that her hive collective was a feminist society. It can further be said that she was a threat to humankind’s existence. What allows the Enterprises’ captain and crew to work to destroy the Borg Queen and her collective is the fourth principle of speciesism. Even if a being is sentient, as indeed the Borg and their queen are, it is justified to kill or harm a nonhuman being when their survival or thriving is detrimental to human life, health and major property.¹⁸⁸ Autonomous human beings would be forcefully assimilated into the collective, joining the hive mind. The atmosphere of earth would be changed so as to allow the full interspecies hive to exist there, and to keep the cybernetics functioning optimally. Humankind, as originally evolved would cease to exist.

Dr. Frankenstein’s monster embodies posthumanism, indeed he is constructed of parts from deceased human beings. His arguments in favor of his personhood are explained above, and in the section dedicated to him his moral status and assertion of his freedom, a la Rousseau and Kant were examined. Because he has command of language, can reason so as to be able to make his case, can feel what he calls benevolence, and responds with anger to maltreatment, he demonstrates his personhood. He is not a great ape. He is not a chimera. He is a made not born human being. (Maybe due to his peculiar construction, he is a multi-born human being.) Infact, Degrazia makes the point that a more encompassing definition of personhood is needed, so he
suggests that personhood refers to a being possessing specific psychological traits or capacities: having complex forms of consciousness, sociability and rationality, and that they might not even be hominids. This certainly describes Dr. Frankenstein’s creature, though he is technically hominid, thus it can be argued that he has the same moral status as any other person. He may be other but he is another person.

He demands his rights, and this sets up the central premise of this dissertation. The persons who are non-normative must be afforded a paradigm of bioethics that is appropriate to them. Dr. Frankenstein did create a female creature, but because of his prejudice he destroyed her, enraging his first creation. This rage at the death of the potential mate for which he had asked was driven by the loss of potential community with another of his species, and the raw expression of Dr. Frankenstein’s prejudice, and the suffering he surmised that she had suffered. This is entirely in line with Rousseau’s principles that before there was reason, self-preservation and well-being inspired a natural abhorrence of seeing other creatures, especially those most like ourselves, suffer and/or die. Earlier, the case was made that ultimately the creature’s case is a call for justice. A prevailing component of the current bioethical paradigm is justice. Justice along with beneficence, nonmaleficence, and respect for autonomy are the foundation of Principlism, which has become the regime that is practiced in the West. Principlism can apply to this creature because he is a sentient, transhuman being, but because he is a “differently embodied rational creature”, according to Reese, something more is called for.

2.4.2 Critical Race Ethics as a Template for Otherness

Race offers a template through which to view the problems posed by trying to understand transhumans, and positively live together with them. Racial prejudice is the epitome of othering in Western societies. Slavery, colonialism and a lot of the old eugenics was based upon it.
In 1952 Ranyard West wrote an article in which he argued that prejudice was inevitable. He sees it as the wellspring from which most serious individual violence comes; clouded judgment distorted by emotion (especially unconscious emotion) is its catalytic agent.

This emotion is simply called passion in his essay. The premise is that we judge all situations through our passions, which we learn from our homes and environments, of course filtered through our psycho-emotional framework. We construct prejudice through projection, selective amnesia and fantasy identification, and this is enhanced when all of this is a part of a group ethos. West cites Susan Issacs concluding that a sense of justice, (which is what Dr. Frankenstein’s creature was seeking) develops as a stand-in for total ownership of all desirable things, so as to avoid total loss of them. It is thus modified selfishness. We are leaving off achieving truth and choosing to master the habit of correct response to the person. In the cases of the Borg Queen and Dr. Frankenstein’s creature the clarity of what the correct response should be proved problematic. West points out that prejudice is instinctual, existing to secure the satisfaction of instinct, and to make us content in our illusions. The familiar pattern must not be broken.

The argument can safely be made that the Borg Queen did not present a chance to lay prejudice aside. She was completely something new. The argument for this was made earlier in this chapter. She met a foul end because she had found a way to go into the past and assimilate all of humankind and the entirety of Earth. She was, however, a marvel of cybernetics, and even in the technologically advanced world of Star Trek: Next generation she would have been a valuable ally, if she would have allowed herself to be so. The usual stereotypical thinking about conceptual man and conceptual woman played out in the interaction between Captain Picard and the Queen. Dr. Frankenstein’s creature was a lot of men pieced together to form a new being.
Unlike the Borg Queen he had benevolence, in other words he was capable of affection and sympathizing with other humans. It was Dr. Frankenstein’s prejudice and the passion that fueled it that set the unnamed creature on the road to his unhappy end. W. O. Brown in writing about racial stereotypes and rationalizations points out that stereotypes are fictional pictures that contain doctrinal justification for the felt antipathies. Hence, they are both the justification and the explanation. It is an amorphous construction, and it is this aimless quality that fuels its utility. This inconsistency allows the holders of particular prejudices to rationalize their beliefs.¹⁹⁷

Rationalization of stereotypes has several functions. It presents an appealing ideology. It expresses the society’s line of thinking. It is a reflection of the intellectual culture and mentality of a society. It expresses an aspect of appreciated stereotype in a society. In origin, role and function the stereotype is uniform in society. It supports a society’s illusions of reasonableness and indeed righteousness. It grows out of the desire for rationality and the desire to make a bias ethical. Finally, rationalization is a shield against skepticism and criticism.¹⁹⁸ Here, the discussion will be limited to Brown’s explanation of “the ethical or idealistic rationalization” as he refers to it. The rationalization under this type is given a “moral sanctity”, being made to seem humanitarian or an expression of concern for the out group. In the case of Dr. Frankenstein’s creature, the rationalization could be that he is so badly disfigured he must be kept away from the public’s gaze. Maybe it could be that he is so strong and agile, like a wild animal, that he must be kept away so that he won’t be exploited. In the latter case his segregation is a benefit to him.¹⁹⁹ Furthermore, the rationalization can be said to benefit the normative humans in Shelley’s novel because they do not have to worry about accidental injury, death or fright if the Dr. keeps his creation out of the company of others.
What can the argument against Sarah Manning and her siblings be? They are clones. They were manufactured in a laboratory, like Dr. Frankenstein’s creature, and presumably the Borg Queen. Using Brown’s ethical/idealistic rationalization they devalue real estate, but this time the real estate is humanity. These new humans pose a threat to the sanctity of human life. One is mostly machinery. The other comes from the parts of deceased people, and Sarah’s family come from petrie dishes. They are all un-natural and as such they are problematical. That is the fundamental argument against enhanced, post or transhumans. It is a prejudice and this dissertation will confront it head-on. It is a fundamental prejudice and as Brown points out, no one who engages in racial rationalization thinks he/she is prejudiced.²⁰⁰

The case of Sarah and her siblings stands apart from the Borg Queen and the doctor’s creature. They are grotesqueries, though by Degrazia’s reasoning persons. Sarah’s family is a set of genetically identical human beings, with patented DNA tags. The rationalization for prejudice against them straddles both the ethical/idealistic and the religious. It, like racial prejudice is concerned with securing normative humankind’s supremacy and integrity.²⁰¹ A theological argument can be seen to quite naturally spring from this concern with the integrity and supremacy of normative humankind and it will be explored in depth in chapter two. Rationalization serves to vaccinate one against insight and all the enlightenment it brings.²⁰² Sarah and her siblings are human and persons. They are differently made, and may have some special components that call for a slightly different bioethical paradigm when they enter a laboratory or hospital.

2.5 Fuller and Lipinska: The Proactionary Manifesto

In their book The Proactionary Imperative: A Foundation for Transhumanism, which will be treated in greater depth in a chapter three, Steve Fuller and Veronika Lipinska post “The
Proactionary Manifesto”. They open with the declaration that humanity is not about the survival of the species homo sapiens, but rather it is about the quality of being human, and that does not necessarily apply to the normative human being.²⁰³ Being proactionary is about being human in the way one desires to be. For them transhumanism is not science fiction and all of the negative tropes of this literary genre explicated above are not salient. To Fuller and Lipinska these tropes are not the natural outcome of human directed human evolution. For them the outcomes will be mostly positive. They point to Jesus’ transcending death and resurrecting as analogous to people wanting to transcend the bodies into which they were born. In the 18th century this transcendence was to be found in Enlightenment, today it is to be found in the drive to human enhancement.²⁰⁴ The Borg Queen can be said to possess humanity, surely she has transcended the body. Dr. Frankenstein’s creature is taller and more powerful than most men. He was dead and now lives, a singular being in which there are parts from different people. In his quest for community and indeed a mate, his desire for revenge for being wronged doesn’t he possess the quality of being human?²⁰⁵ The Leda and Castor clones, created from a chimeric donor, are genetically identical individuals fully possessed of the quality of being human.

Proactionaries would be people who would construct a society in which a voluntary new eugenics would prevail. Humans would be reminded, according to the Fuller and Lipinska of their ‘god-like power over life and death’. This would be in opposition to the corporate takeover of the materials, means and processes of enhancement. This would be a kind of welfare state, where the welfare refers to one’s ability to remake one’s self regardless of social station or income class.²⁰⁶ It would be a society in which hedgenetics is the prevailing ethos. In it intellectual property rights would be conferred upon those who have inherited the common genes, legislation would enforce self-ownership. Locke defines the ‘person’ in this hedgenetic
society forensically. The person is where the locus of agency responsible for the development and management of prescribed bio-economic assets resides.\textsuperscript{207}

In other words, the person would have control over themselves, enhanced or not and any commercial value from that would accrue to themselves. Thus risk-taking would be allowed and indeed encouraged. The ends would justify the means; the individual would be able to experiment with enhancements at various levels of danger to get to a higher state. Society as a whole would be risk taking, ever improving, but science would be the engine. The society will be a utilitarian/Kantian amalgamation: Kantian in that consent for the ends would be required, and utilitarian because efficiency in the means would be required. All options would be put on the table, rationally assessed (rational: having science, mathematics, technology and engineering applied to the options), and the best option would be selected.\textsuperscript{208}

The society would be inclusive. Those who want enhancement, and those who do not will have equal standing. The members of the society might not see a common ancestry. The most transhuman may regard themselves as a different species, but they will be restrained in that they would just be other members of society. Indeed, the people of this society may move to divergent futures. The members of this society would agree on the naturalist principle that all humans are products of the forces of natural evolution, and also the supernaturalist premise that humankind is destined for a radically different life than that of our forebears. The second of these agreements is the most intriguing. We can, a la Kurzweil, find a way to merge with technology, thereby creating a new species: the “techno sapiens.”\textsuperscript{209} Ableism is the transhumanist philosophy. People will be always already disabled because the means to enhancement are always on offer, and greater enhancement is always be made available. One would have the
choice of Kantian autonomy and Nietzschean will to power, or Kierkegaardian angst and being tossed about by warring trends in how people enhance themselves.²¹⁰

Conclusion

Transhumanism, posthumanism and enhanced humans, the germ of these new kinds of persons has already been planted. In this chapter the Borg Queen as the blending of the masculine locus in science and the feminine locus in nature personifies the extreme of cybernetic cyborgism. She represents what fear can, and misogynistic views of women, and their ability to create can construct. Still, she uses the feminine way of inclusion, albeit involuntary to create a new species. She seeks new organic beings and seeks to assimilate them. This is conquest, but not wholesale destruction. Dr. Frankenstein created a new man. Dr. Waldman and his fiancée Elizabeth might say that in creating the new man he stole from God. He presaged in vitro conception and cloning. His rejection and that of other humans otherized his creature, and that led to murder and despair. This horror, this prophetic novel was the brainchild of a nineteen year old young lady, from an enlightened, socially conscious home. Finally, Orphan Black allows us, or rather forces us to examine how we feel about the generation of identical people, and further should they be patented totally or in part. Slavery was the old iteration of people as property. If cloning and any other form of genetic manipulation becomes mainly a commercial concern, the products of this activity will become another iteration of this.

While this chapter dealt with the question of humanity (personhood) through the lens of archetypical science fiction characters, with especial attention to the arguments of Rawls, Kant and Rousseau, this dissertation will examine what we be needed when transhumans become a
sizeable portion of human societies. Fuller and Lipinska’s entire Proactionary Imperative, along with the precautionary arguments that have been offered in the work of Aquinas, Calvin and an explanation of genetic enhancement which can be said to be the most problematic in the debate will be treated in the next chapter. Julian Savulescu’s call for the moral enhancement of normative humans before a transhuman society can flourish, and his work with Nick Bostrom in the broader field of human enhancement will be examined. They offer a justification for transhumanism, attempting to allay the fears that plague human thoughts and feelings.
THE ETHICAL JUSTIFICATION OF TRANSHUMANISM

Introduction

And God said, Let us make man in our image, after our likeness, and let them have dominion over the fish of the sea, and the fowl of the air, and over the cattle, and over all the earth, and over every creeping thing that creepeth upon the earth.

Holy Bible, Genesis 1:26

Human enhancement refers to the scientific and technological developments that are and can be used to maximize human health and intelligence, and prolong human life. These developments have been both feared and to a certain extent embraced by humankind. CRISPR/Cas9, nanotechnology, cyborgism, transgenic experimentation, cloning, etc. have either been prohibited or are being employed now in the health and intelligence arenas. These new discoveries are means to an end; the end is the improvement of humankind. They are mechanisms of the further evolution of homo sapiens, however, in this instance the evolution is entirely driven by the species homo sapiens itself. This is a cleaner, less violent way to evolve, and it would not fit into the natural scheme characterized by chance, danger and mutation. The evolution here is manufactured, that is man is the catalytic factor in and fabricator of the process. The new species can be an amalgamation of nervous/computer wiring, mechanical implants, transgenic experimentation, genetic editing and nano-infiltration.

The development of these technologies has spawned a philosophical and in some ways quasi-religious movement called transhumanism. In this movement human enhancement becomes the means of evolving, in conjunction with changes in the natural and technological environments in which the species lives, ultimately moving toward the singularity where humanity and technology will become one. This has the feel of science fiction but it is real, and it is that feel that has caused people to both fear and be intrigued by the evolution that
transhumanism represents. The fear is that transhumanistic experimentation will lead to Dr. Moreau’s island and Huxley’s brave new world, run by neolutionists (rather sinister characters from the television series Orphan Black). The intrigue is simply about the possibilities that are open to humankind. In this chapter the genetic strand of human enhancement, as well as the transhumanist movement will be examined, and the author will address what he considers to be the underlying assumption that prompts the questions- Are humans playing God, and Is man the epitome of creation- with an eye toward showing why some people may consider the goals of human enhancement as overall positive ones and therefore pursuable. This will not be done from a spiritual point of view. This is solely a philosophical argument, and one based upon the new types of scientific technologies available to enhance the human species

3.1. Introduction to the History of Transhumanism

Dante Aligheri in the Divine Comedy used the term transumanare – to pass beyond human - in the religious or spiritual sense common in 1312.211 This is the first recorded reference to what became proto-transhumanist thought. What today is the philosophical basis for transhumanism began in the late fourteenth century and came to its full fruition in the latter half of the twentieth century.

3.1.1 14th Through 19th Century

Alchemists from the thirteenth through the eighteenth century searching for the Elixir of Life and Philosopher’s Stone can be considered proto-transhumanists, but in 1486 Pico della Mirandola in Oration on the Dignity of Man, characterized God as the craftsman of humankind who gives man a transhumanist explanation of his nature. Humankind has free will and the ability to choose the “lineaments” of his nature. Neither heavenly nor earthly, immortal nor
mortal, humanity could be whatever he/she makes of him/herself. Humankind can through its own decision, become and act brutishly or decide to take on a kind of divinity of action and being. All of this says that humankind is not bound by the same restrictions of instinct, intelligence or imperative that encumber other creatures. Mirandola, in this oration laid out the basic philosophical justification for what would become transhumanism.

Francis Bacon, moving beyond the realm of religion, is a precursor to the transhumanist, advocating inductive reasoning, aiding the turning of Western thought away from Platonic and Scholastic forms of empirical methods. The 18th century thinker Marie Jean Antoine Nicolas de Caritat, the Marquis de Condorcet posited that increasing knowledge in the natural and social sciences, would allow humankind to achieve a world in which individual freedom, material abundance and moral compassion would flourish. He spoke of the interval between birth and death having no assignable limit, and death being the result of extraordinary accidents and gradual decay. Another precursor to modern transhumanism is the Russian Nikolai Fedorovich Fedorov, a nineteenth century Russian Orthodox philosopher, who stressed scientific methods to greatly advance longevity, striving for immortality and the resurrection of the dead in self-creating, immortal form. He also envisioned colonization of space and the oceans. To Fedorov evolution was about the increase in intelligence, with homo-sapiens at the top of the heap. The scientific method which Bacon espoused in his works, de Condorcet writings about individual freedom, material abundance and extending longevity, and Fedorov’s taking of de Condorcet’s theory further to reanimation of tissue and human self-creation laid the groundwork for what became the philosophy and work of transhumanism.
3.1.2 20th Century

The twentieth century saw a more direct line to what we now know as transhumanism. In vitro fertilization was called ectogenesis in Daedalus, or, Science and the Future, (1928) by British evolutionary biologist and geneticist J.B.S. Haldane. He also advocated human directed evolution for its own benefit. In 1929 J.D. Bernal wrote the fantastically titled The World, the Flesh and the Devil, where he envisioned, with the use of his Bernal spheres, the colonizing of space, and the enhancement of human longevity and intelligence through human volition. In 1935 T.S. Eliot in The Cocktail Party, used transhumanized to mean a form of illumination rather than transformation via technological means and the literary genre of science fiction began in this period. However, this is still the proto-transhumanism, (the beginning of a philosophy that starts to look like transhumanism), era. Transhumanism in its present form began in the 1950s.

The latter half of the twentieth century is the era in which true transhumanism as an active philosophy became fully realized. Julian Huxley’s 1957 book New Bottles for New Wine, has a chapter entitled “Transhumanism”. In it Huxley argues that man would continue to be man but would transcend himself by making new possibilities for and of human nature. To Huxley homo-sapiens was the first species to understand the totality of the mechanism of evolution, therefore it was incumbent upon homo-sapiens to take control of that mechanism for the future. Our understanding of the “modern synthesis” – Darwin’s theory of evolution and Mendel’s genetics – Huxley’s argument would posit, allows us to wonder whether homo-sapiens were ethically or cognitively fully human prior to that understanding. This allows the question of humanity continuing to live in enforced segregations, or exist in a state of free mobility to become a political one. Evolution instead of taking its messy long time, can now happen through the application of various technologies and legislation allowing and/or encouraging their
Though Darwin’s theory is foundational to Huxley, it should be noted that Darwin would not approve of transhumanism’s human guided evolution. He would have denied the veracity of underlying transhumanist relationship to evolution such as (a) the directionless process of evolution should be directed by humans, and (b) the latent potential of evolution is fulfilled by humanity. Robert Ettinger, called the father of cryonics, proposed that humans could live again if their bodies were preserved at ultra-low temperatures just at the point of clinical death, in The Prospect of Immortality (1964). He first used the term transhuman in his book whose title could be called Nietzschean Man into Superman (1972) contemporaneously with F.M. Esfandiary. Another contemporary who also advocated for cryonics and longevity research, among other things was Saul Kent, in his famous 1974 book Future Sex.

The first instance of someone developing a collection of philosophically transhumanist ideas is the aforementioned F. M. Esfandiary; in 1972, though his essay “Transhumanism: toward a Futurist Philosophy” used the term transhumanism in its current form in 1990. F. M. Esfandiary, who taught “New Concepts of the Human” classes, at The New School for Social Research in the 1960s, was the founder of a loose organization called the UpWingers. He took the sobriquet FM-2030, and in 1989 published the book Are You Transhuman?”. His writing was literary rather than scientific, and his definition of transhuman was the transitional human whose way of life actively employs technology, and who shares forward thinking values. FM-2030 began to create through his writings and activities a wholistic philosophy of transhumanism. His book included questionnaires, which asked about travel, body modifications, the degree to which traditional family structures and exclusive relationships are adhered to, among other things, and allowed readers to rate their degree of transhumanism.
In 1970 Marvin Minsky forecasted the development of super intelligent artificial intelligence, or AI, which was necessary if humanity continued to increase its engagement with technology to achieve the desired enhanced state.220 Scientific American magazine in 1994 published an article explaining that the biological brain would have to be replaced with more efficient computational devices (read computers), once vastly extended longevity has been achieved. This article, along with the foresight of Minsky points us to the concept of singularity. John von Neumann and Stanislaw Ulam explicitly referred to the singularity in 1958, to wit “the ever accelerating progress of technology and changes in the mode of human life, which gives the appearance of approaching some essential singularity in the history of the race beyond which human affairs, as we know them, could not continue”. Ulam and von Neumann pondering simply stated that human modification/enhancement will reach the point where humanity will be able to merge with technology to the point where that technology will become an integral part of humankind, so that homo-sapiens will need to evolve into homo-transia, if not homo-technica. In 1965 I.J. Good used the terminology intelligence explosion to refer to the same result as the singularity. Eric Drexler’s vision of nanotechnology has had the most influence when it comes to assessing how humanity can be modified to bring about singularity. In the late 1980s the Extropy Institute (ExI) was founded and guided the intellectual and cultural transhumanist movement, and in 1988 Extropy magazine (subtitled “Vaccine for Future Shock”, and later titled The Journal of Transhumanist Thought) provided a publishing platform for various thinkers in the area of transhumanism.221
3.2 The Philosophical Basis of Transhumanism in Fuller and Lipinska’s Proactionary Imperative

The Proactionary Imperative is subtitled “A Foundation for Transhumanism”, and comes after Fuller’s Humanity 2.0: What It Means To Be Human Past, Present and Future. It is an extensive explication of the transhumanistic philosophy and places it within the lineage of Western thought. Fuller and Lipinska locate the foundation of political right and left in the post-revolutionary seating arrangement of the French National Assembly. Supporters of the King and Church sat to the right of the assembly’s President, and their opponents sat to his left. The authors propose the terms precautionary for those on the right and proactionary for those on the left. The center, where the President sat represented the status quo. However, the argument became whether or not France should reconstitute the old status quo with an eye toward greater social justice, or break entirely with the status quo with a decisive push toward self-legitimization. In this context seating changed a bit with reactionaries seating themselves to the right of the conservatives (supporters of King and Church), while those we would consider liberal and socialist sat together on the left. 222

3.2.1. Proaction and Precaution: The Basic Concepts

To take precautionary and proactionary principles into the common era, socially-psychologically thinking precautionary policymakers are concerned with preventing harm, whereas proactionary policymakers focus on the best available opportunities. Note here that it is not just a matter of half full or half empty glasses; both sets of policymakers focus on goods i.e. preventing harm, opening opportunities. Metaphysically, precautionary thinkers distinguish the actual world from the possible world such that a loss cannot be mitigated by the possibilities still open after that loss. The proactionary mind seeks the learning experience; they are willing to lose
something now so that opportunities can be kept open. Loss is mitigated by what gain can come of it. Precautionaries find freedom to be eroded by the taking of significant risk, and that freedom is already delimited by the prevailing reality, proactionaries concern themselves with discovering the limits of possibility so they are risk-takers, knowing that what has already happened does not limit what can happen.

The precautionary principle came from the profession of forestry, in nineteenth century Germany as Vorsorgeprinzip.\textsuperscript{223} It was the result of Georg Ludwig Hartig’s work to provide a foundation for the practice of forestry. The principle mandated that the current generation leave forests in the same state in which they found them, for the next generation. The assumption is that human needs cannot be satisfied by anything other than the forest, and that the value of the forest is itself rather than what can be derived from the forest.\textsuperscript{224} The proactionary principle was developed as foil to the precautionary principle. While the forest does indeed have intrinsic value, what comes from it is also valuable, i.e. it adds value.

The proactionary principle first explicitly appeared on a declaration by Max More in 2005, and the principle was agreed to by a council of transhumanist thinkers. George W. Bush’s Bioethics Council Report is the document that caused its development. The report used the justification of natural law to call for a ban on stem cell research, funded by the federal government. The sticking point was that embryos would have to be sacrificed in the trial and error process and the benefits would not be guaranteed to be worth that loss of ostensibly potential human life. The proactionaries believed the long-term socio-economic risks would come from banning the research because of the aging U.S. population, and the health conditions whose treatment will cost millions in healthcare and welfare payments.\textsuperscript{225}
3.2.2. The Proactionary Imperative Considered in Light of Indebtedness and the Commonweal

The question of indebtedness comes up in the discussion of the roots of the proactionary imperative. It is an underpinning of the belief that humanity must directly involve itself in the process of evolution. Ideally, the self-made man is one who comes unfettered to the past in any way and produces whatever he produces as Augustine put it creatio ex nihilo; this is how God is said to have done his creation. Humankind does not come from no where nor do we create from nothing. Auguste Comte’s neologism altruism comes in here. According to Comte’s altruism theory everyone is born indebted, which came through germ plasm and property if one is fortunate. This debt can only be paid by conducting one’s life as a series of paying-it-forward. Medieval essentialism would have characterized this altruistic way of life as the realization of one’s potential. This debt has both a genetic and economic dimension.

In the legal and political framework for proaction a discussion of the philosophical term axiological is warranted. Both the precautionary and proactionary principles are axiological because they are concerned with values, in particular, what are human beings for. The precautionary principle places humanity as part of the larger whole that is nature, and the meaning of a person’s life is based on their acceptance of that point (self-embedding). The proactionary principle says humanity is not merely a part of nature, but its existence gives meaning to meaningless nature by serving as the means to humanity’s ends. Precautionism sends us back to biology, but proactionarism seeks to take us far away from biological limitation through various acts of self-transcendence. Fuller and Lipinska pose the question as whether humans are animals whose brains are too big or deities without adequate resources. In a practical example of this question Fuller and Lipinska cite Rene von Schomberg’s promotion of responsible innovation policies within the European Commission. There is no answer to the
question, but von Schomberg has narrowed his articulation of policies which promote transhumanist goals of bio/info/nano technologies, to the precautionary weighing harm over benefits for people. He writes these policies with an eye toward international environmental law and conformity to conventional understanding of the welfare state. Proactionaries weigh benefits over harm. This is lexicographic ordering of course but it illustrates the dichotomy that must be bridged. Which is to be prioritized is directly dependent upon the principle that underlies your conviction, your universal prescription...harm or benefit. In other words, are you, an institution, or a policy philosophically geared toward mitigating harm or encouraging the reaching for benefits. The authors Fuller and Lipinska use legal/economic concepts, particularly the property rule vs liability rule to illustrate this, with precautionaries privileging property as is their wont, while proactionaries privilege liability. The entitlement bearer is clear though value is determined in court proceedings in the property rule approach, and again it is reversed in the liability rule approach. Actual owners are favored in the precautionary or property rule approach, while in the proactionary or liability rule approach potential users, others who would benefit are considered. In essence the approach is between what is and what could be.

Comte’s altruism, the weighing of harms and benefits, and the rules of property and liability bring us to a proactionary concept of practical service wherein everyone is taxed and also must participate personally in cutting-edge scientific research. This goes directly to the repayment of debt advanced by Comte. Citizens should participate in scientific research because as is the case with the payment of taxes and the things the tax money have already bought, they will have benefitted from the prior research. They will continue to benefit from research in the future. You are a living citizen, therefore you have incurred an obligation; proactionaries expect you to repay it. There is an existentialist concept of fear unto death; Fuller and Lipinska call it
the leitmotif of human life, and say that it doesn’t necessarily refer to mortality, but to the prospect that one may not have lived up to one’s potential before death. One may not have paid one’s debt. The Proactionary Imperative goes on to advance the hedgenetic proposal in light of this obligation, but it will not be treated here because it is a commercial/contractual principle, and was illustrated in the argument about genetic patenting in relation to humans in the previous chapter.

3.3 Genetics Technology

The area of human enhancement that people have subjected to the most controversial speculation is that of genetic research, and the possible outcomes thereof. The imaginations of those who are skeptical of the work being done in this field have run wild, with the goal of tapping into fear so as to be able to stop what may result. They err on the side of precaution rather than proaction. This author examines three of the technologies that precautionists fear.

3.3.1 CRISPR/Cas9

CRISPR, clustered regularly interspaced short palindromic repeats, has in the last five years become the most promising and feared technology in the field of genetic enhancement. What began with gene splicing has now moved to gene editing, and CRISPR is the ultimate blue pen. The process is a “general bacterial defense mechanism to detect and degrade exogenous sequences from invading bacteriophages”. In the process short pieces of foreign DNA (dioxyribonucleic acid) are processed by CRISPR Cas-proteins into smaller segments which are inserted into the CRISPR locus. RNAs (ribosomal nucleic acids) from the CRISPR loci are processed further into small RNAs (crRNA) of DNA derived from outside of the host. These small RNAs then guide other Cas-proteins such as Cas-9 to cause sequence specific degradation
of the foreign DNA. It is a mechanism to defend the genome against bacterial viruses. This
system serves two critical functions of acquired immunity, memory and pathogen elimination. It
is an artificial process akin to acquired immunity in complex organisms like humans. The system
relies on Cas9 the DNA endonuclease to cause cleavage of the DNA in a sequence-specific
manner. The Cas9 system is a simple and efficient gene editing tool. It depends on the
generation of a double-strand break on the chromosome, and the subsequent cellular DNA repair
process. The proteins are guided by tracrRNA:crRNA complexes to the target site, where the
sequence-specific cleavage takes place. The double-strand break triggers cellular DNA repairing,
such as nonhomologous end-joining NHEJ-mediated error prone DNA repair, and homology-
directed repair HDR-mediated error-free DNA repair. The former can rapidly tie together the
double-strand break, but also generate small insertion and deletion mutations at the target site.
This helps to disrupt or abolish the function of target genomic elements and/or genes.

Compared to other mechanisms such as zinc-finger nucleases, and transcription activator-
like effector nucleases which are built on complex, time consuming protein engineering,
selection and validation platforms of protein guided DNA cleavage, CRISPR/ Cas9 needs no
more than short programmable gRNA for DNA targeting. Its inexpensive and easy to design and
produce. CRISPR /Cas9 is able to induce multi-site simultaneous genomic modifications. This
technology can disrupt multiple genes or a whole gene family to investigate gene function and
epistatic (genes influencing the functions of others) relationships, and accelerate the generation
of transgenic animals with multi-gene mutations. Genome editing has the potential to
permanently cure diseases through the disruption of host developed disease-causing genes,
inserting new protective genes or correcting disease-causing mutations. The disruptions and
additions can be either somatic (specific to the individual subject) or germatic (specific to the
individual subject and their offspring). Though Great Britain, the Peoples Republic of China and the United States have agreed to a moratorium, in December 2015, on implanting CRISPR modified embryos in the womb, in February 2016 Britain allowed a researcher to experiment with CRISPR Cas9 as long as the embryos are allowed to die after seven days, when they will have reached the blastocyst stage. The objective is to understand the cascade of genetic switches that are thrown as the fertilized egg moves through its initial divisions.\textsuperscript{236}

3.3.2 TALENs

Transcription activator-like effector nucleases or TALENs is derived from a natural protein of Xanthomonas, which is a plant pathogenic bacterium. Thirty-three to thirty-five conserved amino acid repeated motifs comprise the DNA binding domain of TALENs. Each of these recognizes specific nucleotides. TALENs is programmed to target DNA sequences through the shuffling of repeated amino acid recognition motifs. This is a protein guided process. CRISPR-Cas9 and its use of small RNA for sequence-specific cleavage has made it the more widely used technique.\textsuperscript{237}

3.3.3 Cloning with Emphasis on the 2013 Breakthrough

Ever since 1997 in Scotland where Dolly the sheep became the first successful total organism clone, controversy has surrounded the issue. Some in the general public and among policymakers immediately began campaigning against the cloning of a complete human being. Cloning is the nuclear transplantation to produce stem cells, and in the case of humankind, the biochemical replication of human organism.\textsuperscript{238} Cloning can be done on several levels. The first is the all-inclusive total organism level. The next is tissue and organ cloning; then there is the exploitation of the natural process of cell division to make copies of the entire cell, the result of
which called the cell line is identical to the original cell. Finally, a specific segment of DNA is replicated to be used for further scientific research. These segments are maintained in clone libraries.\textsuperscript{239} All of these cloning levels have been going on for at least the last three decades.

The first and third levels of cloning were practiced at the Oregon National Primate Research Center, and it was here in 2013 that a major breakthrough in cloning efficacy was achieved. Scientists at the Oregon National Primate Research Center, affiliated with Oregon Health and Science University, since the late 1990s had been working on cloning non-human primates. In 1997 the lab was first to use nuclear transfer technology to clone primate embryos, and in the early 2000s Shoukhrat Mitalipov and his team attempted to clone either rhesus monkeys to use as model organisms for studying human disease, or embryonic stem cells. Both efforts failed, until 2007 when the team successfully produced embryonic stem cells from cloned rhesus embryos. Their success came from their refining of the technique of removing the genetic material from oocytes without causing so much damage as to render them unusable for supporting embryonic development. Spindle transfer, which enables mothers with heritable mitochondrial diseases to have genetically related offspring without those diseases, is the procedure with which Mitalipov and his colleagues experimented. The method creates embryos with three genetic parents, and it is akin to cloning because of the techniques it employs, the aims it could serve and ethical problems it raises.\textsuperscript{240} The team also created primate chimeras – animals that are composed of tissues derived from more than one genetically distinct individual, not necessarily from the same species. They combined six different embryos and produced chimeras that grew up to be composed of cells from three different embryos, with genetically distinct cells in all their tissues and organs. They were male, normal and healthy, but one had a small proportion of genetically female cells.\textsuperscript{241}
In 2013 Mitalipov et al were the first to successfully use cloned human embryos to produce embryonic stem cells. They had a one in five rate of success and found that cloning attempts using eggs from some women were more successful than with eggs from other women. Using the strenuous ovarian-stimulation treatments to collect eggs resulted in a lot of eggs but less cloning success, so the team used a gentler harvesting technique that produced fewer but better eggs. Two teams not affiliated with the Oregon team duplicated the success in 2014.242

3.3.4 Haploid Stem Cells

At the Azreili Center for Stem Cells and Genetic Research at the Hebrew University of Jerusalem haploid embryonic stem cells have been developed and induced to divide on their own to differentiate into tissues such as heart, gut and brain cells. Usually, human stem cells are diploid that is they have twenty-three chromosomes from both the father and the mother. These cells are egg cells and have the chromosomes of one parent. This represents an advance into the regeneration of organs that stem cell research promised. Whether this should be forgone concerns the common assumption of the current morality. Director Benvenisty of the Center points out that this process also allows the easier detection of single gene mutations, because the backup copies that may be in the other chromosome set won’t be present. Researchers can now mutate single genes and instantly ascertain the effects.243 Dr. Egli of Columbia University Medical Center, and co-author of the study with Dr. Benvenisty, sees the next step as developing a loss-of-function regime, i.e. modifying these cells to correct disease variances or introducing new variances.244

The process involved the generation of human parthenogenetic stem cell lines, which came from haploid (having only one set of chromozomes) oocytes. Thus the cells were female. Through various inducements the cells lines successfully isolated and maintained normal haploid
karyotype (arrangement of chromosomal and nucleic appearance). These cells exhibited the normal pluripotency of stem cells such as the capacity to self-renew, and a pluripotency-specific molecular signature. In haploid cells the mitochondrial abundance relative to nuclear DNA was higher than in the diploid cells. In neural differentiated haploid cells they remained haploid even after ten days. By twenty days not just the progenitor stage cells differentiated, with high efficiency (>90%), into mature positive neurons. Spontaneous beating clusters were found during an eleven day protocol in cells differentiated into cardiomyocytes. In those differentiated into pancreatic lineage, both diploid and haploid, produced positive endoderm cells, at 56% haploids, and 13% positive pancreatic cells.245

3.4 Ethical Arguments for Caution (the precautionary principle)

For the purpose of this treatise Mirandola’s Oration is used as an encouragement for the proactionary argument. However, the premise that humankind is special, at the top of the heap among God’s creatures is part and parcel of the great foundation of religious/moral belief. Yet when it comes to matters of concern to this chapter this premise is frequently used as a prohibition against usurping God’s authority, i.e. playing God. A non-supportable ethical dilemma is the result. How often have we heard exhortations about man being only a little lower than angels, or admonitions that begin with if God had wanted people to fly, swim, etc repeated? It is almost contradictory that humankind’s supremacy is lauded and gainsaid in the same breath. This points to the untenability of both concepts. An argument can be made that a petit demigod can do nothing other than play god. If in this case humankind is the petit demigod and the Abrahamic deity is the God then the mandate in Genesis is a call to action and the proactionary imperative is justified. Another reader of Mirandola and the other philosophical and scientific arguments in this chapter may arrive at different conclusions and argue differently.
3.4.1 Question 1: Is Humankind the Epitome of Creation?

Here let us go back to the quote from the book of Genesis, used epigrammically at the top of the introduction . . . And God said, Let us make man in our image, after our likeness, and let them have dominion over the fish of the sea, and the fowl of the air, and over the cattle, and over all the earth, and over every creeping thing that creepeth upon the earth. To members of the Abrahamic religions and indeed throughout the Western world this passage is the germ of the belief that humankind is the epitome of God’s creation, because man was to be created in the image of God and because God gave man dominion over all the earth and its inhabitants. St. Anselm, in the 11th century, wrote an ontological argument as an a priori proof of God’s existence. In essence his argument is that God exists both in understanding and in reality. He also takes as a given that God exists and nothing greater can be conceived, nor can or does exist, either in understanding or in reality. This can be said to be one of the first academic arguments in Western philosophy for the existence of the Biblical God.246 Brian Davies in his guide to Aquinas’ Summa Theologiae explicates Aquinas’ argument in this manner. Concerning humankind being in God’s image Aquinas makes a distinction between image and likeness. Something can be a likeness of something without being an exact reflection. That something is like the thing in some way. If something is in the image of a thing then it is a more precise reflection of that thing. As to humans having dominion over the earth and all that inhabit it Aquinas posits that the fact that humans (Adam) have understanding and will puts them in the utmost position atop the heap.247 John Calvin in his Institutes of the Christian Religion, makes a statement about the likeness of God, that it is embodied in the fact that man’s nature supercedes the nature, i.e. intelligence and adaptabilities, of all other creatures.248 He goes on to write, and I intentionally quote Calvin’s language as in the previous statement because paraphrasing would
erase the subtlety of the ideas contained therein, “Accordingly, the integrity with which Adam was endowed is expressed by this word, when he had full possession of right understanding, when he had his affections kept within the bounds of reason, all his senses tempered in right order, and he truly referred his excellence to exceptional gifts bestowed upon his maker”. Calvin writes that all of this sets up a tacit antithesis that elevates humankind above all other fauna and separates humankind from what are referred to as the lower species. The argument then is that humankind has the right to create. As we shall see in later chapters just how much humankind should create is the ethical question.

It is precisely this antithesis, a creation separated from the overall creation into which it has been placed that has underlined the anthropocentric view of humankind as the center of all God has made. Two further assumptions underlie this view. They are the assumptions that man was created, and that a God was responsible. The primary ethical standards stem from these assumptions and the precedent antithesis. Darwin’s theory of the progress of humankind from single-celled creatures to modern homo sapiens is in his book Ascent of Man. It sets out the theory adhered to by the scientific community as a whole. It does not hold that the primogenitor of the various hominids was an immaculate omnipotent, omnipresent and omniscient God, rather a primate ancestor. There neither exists factual proof of the existence nor nonexistence of God. From there, some may indeed reason that because of the above conclusions, that the assumptions they contradict require that judging the right or wrongness of human enhancement cannot be assessed accurately by the application of a morality or ethics based upon the belief in a God, or the place of created man in God’s creation. From that perspective, we need a new morality, and the progress of the science of human enhancement will drive the development of this new morality.
The main argument against transhumanism/human enhancement through biomedical means illustrates why a new morality must be developed. What Allen Buchanan calls the “conservative argument against biomedical enhancement” says that even though past human enhancement such as numeracy, literacy, immunization, agriculture, etc. has been what he calls productive, i.e. have helped humankind increase productivity, because of the uncertainty of the outcomes of genetic and biomedical enhancement we must be wary. In fact, we must draw a line under enhancement. This argument is precautionary in that it concerns itself with negative what-ifs, harms rather than benefits. The question becomes a simple Why. Is humanity to make no more progress because of the fear of the unknown? If so then the voyages of Columbus and Magellan should never have taken place. NASA should not have explored space, and De Bakey should not have attempted heart transplantation. Progress occurs because we do not know. It is driven by a desire to learn and explore. It is productive. Humankind learned how to preserve and transmit information across cultures and time through the progress brought about by literacy and numeracy, and we became much more productive.

Could not the assumption that gene editing through CRISPR/Cas9, and stem cell research would improve human productivity be a legitimate one? Surely homo sapiens who are susceptible to fewer genetic defects would be not only healthier, but potentially more productive, however productivity is defined. Cloning, genetic manipulation, nanotechnology, neuro-computer interface and transgenic transplantation are new and paradigm-changing technologies. There is a potential for a new kind of hominid to be developed, since they can in some cases be different from homo sapiens (thus the product of human driven and benign evolution), the old moral and ethical rules must, then, evolve to include them. Furthermore, the precautionary principle could be construed to augur for the holding fast to the current moral/ethical paradigm.
because there is uncertainty of the kinds of new paradigms that will be created. Uncertainty has not held the field long in the advancement of human progress. Before Copernicus and Galileo the common understanding in the West was that the Earth centered the solar system. There was a battle but science triumphed. There was a belief in the divine and absolute rule of monarchs, but the Magna Carta, U.S., French, and Russian revolutions based upon the philosophy of personal worth and dignity, individual liberties, etc. relatively swiftly put an end to that with rare exception. The belief that humankind could not leave earth and further travel into space was shown to be false by the Wright brothers and their plane and the U.S.S.R. and Sputnik. Then there is 5G or the Internet-of-Things, these examples and many others are illustrations of humankind’s propensity to proaction, and I would expect that there will be many more. The current comforts were destroyed and some people’s positions were made more precarious but overall humankind progressed, and many more benefitted from the change.

3.4.2 Question 2: Are We Playing God?

Humans can now fold artificial genetic material into whatever 3D shape they choose. DNAs are naturally occurring and were the first nucleic acids to be used, but sometimes they fell apart before the origami process could be completed. The delivery of drugs more accurately to where they are needed is the goal in this case. However, the instability of DNAs caused scientists to look further. Dr. Alex Taylor and his colleagues at the MRC Laboratory of Molecular Biology, Cambridge, UK use XNAs (xeno-nucleic acids) instead. The same bases as in DNAs are used to code genetic information, and are linked to a backbone of artificial molecules to increase their stability. In a tetrahedron structure the XNAs were still intact in a blood serum at body temperature after eight days. XNA and DNA can be combined to build complex nanotechnologies. Deoxyribosnucleic acid is one of the basic structures of human cells, and
the work of the Laboratory of Molecular Biology is showing that even this can be manipulated and restructured by humans. It and other nucleic acids can be built up and combined with artificial molecules into a 3D bullet to accurately deliver medicines, and has the potential to be used in nanotechnology. This restructuring of human building blocks into other forms brings us to the narrower of the precautionary arguments. We should not be playing God.

Buchanan says that the conservative argument assumes that biomedical enhancements are not needed to sustain the state of well-being many humans now have or to assure that others achieve this well-being. Further, the argument assumes there may be an expressivist mindset at work, (taking on the capacity to become God, a not fully realizable entity without man’s acceptance of the role). He says that this mindset is seen as a sign of bad character. However, Buchanan contends that there is no evidence of expressivism (pursuing enhancements/transhumanism with little regard to consequences), in biomedical enhancement to date. The United States, Great Britain and China, for example, have agreed to a moratorium on the use of CRISPR/Cas9. This is consequentialist and at least nominally precautionary. They are not rushing headlong into the possibilities the procedure presents, rather they are pausing to consider the possible negative results. This deliberation illustrates the lack of abandon that underpins play. However, for the sake of the argument, reference must again be made to the Biblical mandate for Man to have dominion over creation. If humankind has dominion, as part of the mandate of the Creator God, and is in this God’s image then creating as God did is humankind’s duty. Rather than playing God humankind is to continue the process of creation, i.e. continue God’s work. Hegel’s philosophy of history fits here. His assertion is simple: temporality is constitutive of God’s self-realization, and therefore God’s creation is incomplete as long as there is a distinction between God and humanity.
Theomimesis is the Greek term for playing God. Fuller and Lipinska see it as their particular neologism for reading God’s mind and acquiring God’s mindset.\textsuperscript{258} If we limit ourselves to the Abrahamic God of Judaism, Christianity and Islam (and the morality derived therefrom), we see a God who’s nature is like humans’ in so many ways that it is reasonable that humankind should strive to be like that God.\textsuperscript{259} Fuller and Lipinska cite two heresies from Antiquity that they believe give the transhumanist grounding in the right or duty of humankind to practice theomimesis. The first is named after the Celtic lawyer Pelagius, who believed that every man can rise to create a heaven on earth. Christian salvation can be viewed as a technological progress. The progress begins with the disciplining of nature, animal husbandry and agriculture, and then moves to the bending of the environment and topography to benefit the coexistence and flourishing of humankind. This culminates in transhumanism/human enhancement. The second heresy does not lead directly to transhumanism. It gets its name from Arius, the 3\textsuperscript{rd} century Libyan bishop. He believed Jesus had no more special relationship with God than did other humans. Christian salvation was cashed as scientific progress, if you will. The discipline here was of the mind, abstracting from the diverse sensory modalities to that which transcends the animal body. Arianism wanted to denaturize humanity, herein directly tying into the mind of God. The Pelegian humanizing nature is characterized by biomimetic processes enabling, through incorporating the rest of nature, the extension of human powers. Arianism connects to transhumanism through its denaturizing humanity concept known as morphological freedom - human essence migrating across material forms, e.g. from carbon to silicone, or possibly diffusing through the cosmos.\textsuperscript{260} If we consider the lack of evidence for both the existence or nonexistence of God, the question of theomimesis can be seen as moot. Thus,
what some see as playing God may be seen by others as merely humanity taking responsibility for its own evolution.

3.5 Discovering What Is: An Experimental City

As much as the possibilities for the loss of a shared collection of normative values is concerned, the creation of new species and the modification of others perplexes and frightens some people and institutions. Combatting this angst is about finding out what is so. Nea ete saa, what is so, is a concept in the Akan language and philosophy.\(^{261}\) (There is no word that is the equivalent of “fact” in the Akan language.) What is so, is exactly what needs to be ascertained when it comes to what the outcomes of transhumanistic experimentation will be. From there gaining knowledge of what could be called the truth (it is so – the Akan concept) will allow society a basis to begin building the ethical paradigm necessary to fit these findings.

Transhumanistic experimentation represents what Siddhartha Mukherjee refers to as both a scale shift because the advance has and is coming with the proliferation of human enhancement technologies, and a conceptual shift in that the advance is coming because of a radical new way of thinking and experimenting.\(^{262}\) It is the contention of this author that as is the case with other paradigm shifting technologies and innovations, whatever can happen will happen. Engaging the possibilities with an eye toward understanding and guiding their development and dissemination, in other words, finding what is so, is the best course.

The United States has the ability to construct buildings for quarantine and super-maximum prisons, which are relatively escape proof. I propose to construct a planned, super-maximum city for the research and development of all forms of potentially dangerous or germatic human enhancement. This will include but not necessarily be limited to gene splicing and editing, transgenic experimentation, nanotechnological human enhancements, neuro-
computer interface experimentation, and cyborgism. All of the latest containment and decontamination technologies at levels three and four will be employed, and enhanced and updated whenever the technologies advance. Level three biocontainment protocols apply to indigenous or exotic agents infectious to humans that can be transmitted as an aerosol. Biocontainment at level four seeks to contain exotic and dangerous agents that are a threat to human life. Spontaneous mutagenesis will be the main concern as it pertains to germline modified entities but synthetic biocontainment measures can be taken to deal with this, as is already the case with GMOs deployed in both large scale and open environments. While precaution is necessary, the proactionary mindset will prevail inside the walls of this city.

Generally, residence in this city will be voluntary for the staff and participants. Informed consent will characterize the process through which they are recruited. A release would be signed by staff and participants to undergo whatever procedures, tests and enhancements that are entailed in the protocols before taking up residence. In some cases, a contract obligating the researchers and other staff to stay permanently within the city will be required, depending on the research and experimentation in which they are engaged. Any new species, or modified species will be confined to the city until such time as it can be determined that said species or modified species can safely interact with both humans and the outside environment. There will be some staff and others who may never leave the city.

All efforts will be made to make the city as welcoming and vibrant as any other. The principlism concepts of justice, autonomy (in a modified form), nonmalefience and beneficence will be applied, but these ethical concepts may/will be modified if it is found to be imperative. Any discovery will be shared with the outside world. Any benefit will be made available to all. (An act of the appropriate legislative body will be required to make this mandatory.) The idea
here is to make sure that social standing, income, intellectual ability or prestige will not be able to dictate how the positive fruits of this research, and/or this city will be distributed. Expert qualifications will be required for all staff positions, but there will be positions for which people who have not had opportunities for excellent training to take so that they can learn on the job. Again, staffing will be strictly voluntary. Where possible and appropriate, both secondary and college level students will be able to intern there. This staffing process and the internships are steps toward making sure that justice prevails; qualified people will be hired and efforts will be taken to create qualified people from a diversity of groups.

Autonomy will be fulfilled as far as it is safe to do so. Because of the nature of the research to be done in the city full autonomy cannot be allowed. The fact that some may never be allowed to leave will be the major breach of the norm of autonomy. Of course, new and significantly modified species most probably will be confined. While harming either staff or research results/creations (for lack of more appropriate words), will be avoided at all costs, because this city has experimentation and research as its prime directive, the standard of no harm cannot be met. The standard of practicing beneficence WILL always be met. Doing what is in the best interest of both staff and research results/creations will be the norm and strictly enforced. As far as possible those new or modified species that are the result of research done in the city will be given as much freedom of all kinds as is safely possible. How much autonomy will be possible will have to be ascertained through observation, trial and error. All of these considerations must necessarily take into account sentience (the ability to feel, perceive and subjectively experience one’s life inputs), whether the creations are modified non-human animals or modified humanoids. The Akan philosophical concept of quasi-physicality may help here. Quasi-physicalism refers to that which stands between the world of the spiritual and the physical,
or that which is material and obeys the laws of physics.\textsuperscript{267} The factors involved in sentience can fall under this umbrella. Kwasi Wiredu who coined the term makes the analogy with thought itself, saying that thought or the possibility thereof cannot be logically physical because it is not an entity. It is betwixt and between, neither material nor immaterial and thus, falls into quasi-physicality.\textsuperscript{268} If the modified or newly created entities exhibit the quasi-physicality of sentience then autonomy will have to be at the appropriate level to match the level of sentience. This goes back to the simple truth that nothing can be known about what will result, or how what results will behave until those results are known/created. What autonomy these results/creations can have must be geared expressly to them and their particular and peculiar characteristics and behaviors. That is the only ethical way for the autonomy to be appropriate. Thus, the ethical paradigm in which the research takes place, and how staff, participants and results/creations are treated will have to be constructed as the city evolves, but the basic rules of principlism is a good foundation upon which to build.

\textbf{Conclusion}

All forms of human enhancement are opportunities for humankind to grow and evolve. They are opportunities that stretch the capabilities of our species…to increase productivity. More practically they represent the opportunity to get stronger and healthier, to live better and longer, and to safeguard future generations from unnecessary genetic mutations, infections and disease. CRISPR/Cas9, haploid stem cells and transgenic transplantation are primary examples of the opportunities that are already developed. Cyborgism as evidenced by the new limb prosthesis technologies, is already in use, while the interface between the human nervous system and computer technology is still more plan than practical application, even that will inevitably be “on line”.
This kind of innovation naturally concerns people on religious, moral, ethical, social justice and other grounds. Will the benefits be meted out according to ability to pay, as is usually the case in capitalist countries, or will everyone share more or less equally? How will humanity determine where to draw lines, and set standards of morality? What will the ethical rules governing these technologies and the fields to which they will be disseminated? These are questions that will take a paradigm shift in morals and ethics, and with the trends that are seen in the developed world, especially the global north, some may call into question the applicability of religion. Transhumanism, a philosophy that coalesced around proto-concepts that began in the fourteenth century and flowers today as a name and system of values for those who embrace the possibilities of the enhancement technologies, may become the philosophical basis, along with the technologies themselves that undergird the shift. Fighting against either the technologies, or the new moral set that results from them and their application is futile. As Captain Picard of the USS Enterprise, on Star Trek: The Next Generation, would say “Engage”.
Introduction

Biomedical ethics concerns itself with questions such as what the rights of the patient both in hospital and within research studies are, what researchers and medical staff owe these patients and the advancement of science and medicine, and what society must do so that the rights of patients and research participants are protected and the science and medicine are advanced. With the advent of the possibilities inherent in transhumanism these questions have taken on added import. Biopolitics enters into the discussion because these transhumans will live with natural humans. Just what should their rights be? Will they be better rather than just different, and if so how should natural humans live with them? The theories of Max More, Natasha Vita-More and Ray Kurzweil are often the prominent voices heard on the question of the desirability of progress toward the paradigmatic shift in enhancement that the term transhumanism suggests, and the philosophical field that transhumanist scholars seek to explain and promote.\(^{269}\) However, this chapter will concentrate on the writing of two distinct voices Nick Bostrom and Julian Savulescu. The former tackles the question of whether intelligence enhancement can happen, and if so how. The latter says that before transhumans join natural humans on this earth some serious moral enhancement is necessary.

In his book Superintelligence: Paths, Dangers and Strategies Bostrom defines and explains what superintelligence is and what it can lead to.\(^{270}\) He is also careful to acknowledge that endowing the individual human with this sort of intelligence is not yet feasible. The question of what we owe and can expect from superintelligent beings is also examined. In other writings
he argues the desirability of being posthuman (another term for transhuman), and he offers an argument for assessing why enhancements have not happened organically.

Julian Savulescu, in his book written with Ingmar Persson, Unfit for the Future: The Need for Moral Enhancement argues that humankind must undergo moral enhancement, not just for the future enhanced beings, but because the current system of morality is inadequate to the current task. He undertakes to address the bias in favor of humans as is, and that prejudice in light of what will be needed when enhanced humans are a regularized population. What are our obligations to people who aren’t human in the same way that is normative today? That is his central question.

Both Bostrom and Savulescu seek to clarify the fact that human enhancement is not a challenge to God, or need not be a source for fear. They begin to lay the groundwork for an ethics for dealing with enhanced or post-humans. In this chapter I examine Bostrom’s superintelligence theory. His theory will be interrogated using the work of other ethicists. Finally, Julian Savulescu’s work suggesting that humans are in need of moral enhancement before we go fully into other forms of enhancement will be treated.

4.1 Superintelligence

Simply put superintelligence is any intellect that exceeds to an extraordinary degree current human cognitive capacity. The natural first thought is to surmise that superintelligence refers to individual people being enhanced either through nanotechnology, genetic manipulation, drug therapy or direct neuro-software interface. Those who are wary of the possibility of superintelligence think in terms of mega-minds, who do or do not have large craniums and who behave in a machine-like manner. In the scenario Bostrom lays out, Star Trek: The Next
Generation’s Borg, a highly intelligent cybernetic being examined in depth in chapter two, is more likely than the mega-mind. As will be explained later in this chapter intelligence enhancement through genetic means would take generations to achieve. A proper plug-in interface between human and computer would be cumbersome and impractical in most situations. In this section a little history of artificial intelligence is given, with an emphasis upon the optimal Bayesian agent. Then the various paths to superintelligence will be surveyed, specifically whole brain emulation, biological cognition, and brain-computer interface. The forms of superintelligence will be examined taking into account that machines will have a definite advantage over biological humans. Finally, the superpowers of superintelligence will be treated.

4.1.1. AI to Superintelligence Defined and Explained

Artificial intelligence (AI) is the fundamental beginning of superintelligence. Prior to the 1990s the logicist paradigm, “rule-based artificial intelligence…mental processes in simple algorithms, short programs in high-level programming languages, which are largely understandable in isolation from each other”, according to Ben Goretzel, was focused on high level manipulation of symbols. He called this “good old-fashioned artificial intelligence” (GOFAI). By the nineties, however, neural networks and genetic algorithms began to work out the bugs in GOFAI, still there continued to be a small amount of damage to the neural net which degrades its performance a bit (the graceful degradation). It didn’t crash the net, just degraded it a little. This more organic system, even with the degradation has the ability to learn. The AI can now learn from experience. Thus, the nets became proficient at classification problems and pattern recognition. Back propagation algorithms and multilayered neural networks, especially with more powerful computers allow for broader and more in-depth learning. The neural nets, as
the name implies are more brain-like and organic, and are thus a leap forward from the brittle, logic-chopping performance of GOFAI.\textsuperscript{274} This is machine-learning at its best.

The ideal mathematically specified tradeoffs underlying this learning is known as an ideal Bayesian agent. It begins with a prior probability distribution which is a function that assigns a probability to each possible world. The simplicity of a world can be defined in terms of its Kolmogorov complexity. This is a measure associated with the shortest computer program generating a complete description of that world. The agent receives new information, and updates the probability distribution by conditionalization on the information according to Bayes’ theorem. Conditionalization refers to the mathematical operation that set the new probability of the worlds inconsistent with the new information to zero, and renormalizes the probability distribution, which the agent can designate as the new prior in the next time step, results. The probability mass concentrates on fewer, simpler worlds as the agent learns from new information. This is a learning rule. A decision rule is also needed if there is to be an agent. Because of this it is necessary that there be a utility function that assigns a number to each possible world. The number represents the agent’s preferences in assigning desirability to the worlds. The agent selects the action with the greatest utility at each time step. Together the learning and decision rules define an optimality notion for an agent, and this notion is widely used in economics, epistemology, statistics, and most pertinent to this treatise, artificial intelligence. These optimality notions set a standard for judging heuristic approximations, and sometimes allows for reasoning about the performance of optimal agents in special cases.\textsuperscript{275}
4.1.2 Whole Brain Emulation, Biological Cognition, Brain-Computer Interface

From AI progress in intelligence or cognitive enhancement the technology has moved to three possible theoretical hypotheses. These are whole brain emulation, biological cognition and brain-computer interface. Uploading or whole brain emulation is a process by which intelligent software is produced by scanning and closely modeling the brain’s computational structure.

Three main steps - scanning, translation and simulation - must be followed and mastered if whole brain emulation is to be realized. First a specific human brain is scanned in detail. This can be done on the brain of a deceased person by sectioning slices and scanning each slice. This will require multiple scanning machines. The second step involves reconstructing the slices into the three-dimensional neuronal network image that implemented cognition in the original brain, in a computer. Current imaging machines can combine these steps. The image is then combined with a library of neurocomputational models of different neuron types, and kinds of neuronal elements e.g. synaptic connections. The neurocomputational structure in step two is implemented on a very powerful computer. Success would be a digital model of the original intellect with intact personality and memory. Note, the mind is now emulated as computer software. It is outside of a human body. This emulation requires only the understanding of low level functional characteristics of the basic computational elements of the brain.\textsuperscript{276} It must be noted that there are levels of emulation, which relate to the fidelity of the function of the model to the organic brain. High-fidelity emulation means that the model has the full set of knowledge, capabilities, skills and values of the emulated brain. A distorted emulation is mostly able to do the same intellectual labor as the emulated brain, but its dispositions are significantly non-human in some ways. A generic emulation is like an infant’s brain and can learn in ways that any normal human can
learn. This generic emulation is thought to be possible by the middle of this century while the higher levels will take considerably longer to achieve.²⁷⁷

Biological cognition is about enhancing functioning human brains. This is the most direct approach. Selective breeding is the method that would be used, not technology. Multi-generational enhancement may be needed to achieve optimal results. The selection will be at the level of gametes and embryos, rather than aimed at controlling mating patterns. Analysis of the complete human genome for complex traits, using a vast sampling of subjects is now feasible and will become a trove of the architectures of cognitive and behavioral traits. Traits, like cognitive ability, with non-negligible heritability will be selectable as a result of this analysis. Data is the primary requirement here. Once this is understood the process of iterated embryo selection can be followed to achieve enhancement in a much shorter span than generations of human maturation. Iterated Embryo Selection is a four step process. (1) Genotype and select the embryos that are highest in cognitive traits. (2) Extract stem cells from these and convert into ova and sperm maturing in six months or less. (3) Use the new sperm and ova to produce new embryos. (4) Repeat until there are large accumulations of desired genetic cognitive changes.²⁷⁸

Robert Sparrow writing in critique of John Harris and Julian Savulescu compares cognitive enhancement at the genetic level as eugenics, and he argues that this version of it is not that different from the old version. He especially draws attention to the fact that preimplantation genetic diagnosis involves selecting embryos on the basis of above species typical capacities. He goes on to include the possibility of cloning positing that parents or societies may use somatic cell nuclear transfer from existing people who possess above species typical characteristics.²⁷⁹ For Sparrow this a form of eugenics; it occurs at the genetic level, rather than as the result of controlling the mating behavior of humans. Like the eugenics movement of the 1920s and 30s,
this whole process could easily lend itself to creating an uber-intelligent, best of the species person.\textsuperscript{280} Paradoxically, in a journal article by both Savulescu and Ingmar Persson, Savulescu argues against cognitive enhancement because humans may already be too smart for their own good, harm is much easier than benefit, and its rational not to do an improvement if the risk of grave harm is great. They arrive at these conclusions because of humankind’s capacity to build weapons of mass destruction, and engage in warfare. Ultimately, they propose that moral enhancement is needed before other enhancements come online.\textsuperscript{281} However, this sort of biological cognitive enhancement can have important consequences such as the acceleration of science and technology, including more potent forms of biological intelligence amplification and machine intelligence.\textsuperscript{282}

Brain-computer interface is something that is currently happening. Electrical currents are being used to reduce symptoms in Parkinson’s patients, by stimulating certain areas of the brain, with an eye toward permanent implants in the brain. Though promising this may prove less practical than conventional therapies. A purer form of enhancement would mean being able to import large blocks of information into the brain. Bostrom writes that having all this information in the brain will not necessarily increase the rate of thinking or learning unless the neural mechanisms for processing the data were upgraded. A whole brain prosthesis would be needed to achieve this (artificial general intelligence). This sort of prosthesis has been used in rats, and has shown that simple working-memory tasks can be enhanced with it. The experiment was done in rats with synaptic blockage. The hope with this cyborgism is that a brain with a permanently implanted device, connected to an external source, would learn over time to effectively map between its own cognitive states and the inputs it receives from, and its outputs to the device. In other words, the brain would intelligently adapt to the interface.\textsuperscript{283} What follows is an
examination of what Bostrom believed would be the more likely way that superintelligence will be developed.

4.1.3 Cognitive Superpowers

Here the most likely scenario for the development of superintelligence will be briefly discussed. Humankind reached dominance because of the slightly expanded set of faculties that the human brain possesses. Bostrom argues that superintelligence will most likely come to fruition not within the organic human brain, but rather through AI. AI should be viewed as smart in the way that the human brain is in relation to a bug’s brain. To illustrate this we are taken into an AI Takeover Scenario. The project that controls superintelligence must have access to a source of great power. The locus of power would be within the system itself. As an agent machine superintelligence would be extremely powerful, able to assert itself against the genesis project successfully, and against the rest of the world. The empowerment sequence will have four stages. The first, called the pre-criticality phase, is where the seed AI is created, and this AI is able to improve its intelligence. Initially human intervention will be necessary as guide and work horse, but as the AI’s capacity grows human help and influence will wane. Then the project will enter the recursive self-improvement phase where not only is the AI improved, but the mechanism of that improvement is itself improved. This causes an intelligence explosion (a speedy cascade of recurring self-improvement cycles), which in turn exponentially enhances the AI capability. This is where the actual take-off occurs. Third, the project moves to the covert preparation phase. The AI has gained a super ability to strategize in its best interest. Rather than going the science fiction route, where silly plans that humans can outwit are developed, the AI conceals its intellectual development from humans so as not to cause alarm. It may pretend to be docile and cooperative, masking its true proclivities. It may use social manipulation to get itself
uploaded to other devices. It may also use hacking to escape confinement to one device. Access to the internet will enhance its knowledge base and allow it to engage in commerce to buy computer power, data and other resources. Its hacking superpower can result in the takeover of laboratories and robotics, while its social manipulation superpower could be used to persuade human collaborators to act as its hands and legs. The overt implementation phase is the final one. In this phase the AI is free of “fear”, and can implement its full set of objectives. If humanity is seen as a threat then a strike, a la Skynet in the Terminator movies will take place. Humans and any automatic systems created by humans that can intelligently threaten the goals of the AI are eliminated. Low level biotechnology can be used worldwide to lay the groundwork. Then, at a pre-set time nanotechnology will be used to deliver the coup de grace. Now if the AI does not necessarily regard humans as a real threat, then more gradual habitat destruction will be the way that humanity goes extinct, as resources will be dedicated to the maintenance and expansion of the AI territory. Insomuch as human brains have valuable information, they will be extracted, scanned and the information will be stored in the proper units.  

4.2 Bostrom Interrogated

While Nick Bostrom’s theories on superintelligence have become the most well-known theories on superintelligence since their publication in 2014, he has made cogent arguments in favor of enhancement, which he alternately calls posthuman. This section will engage with those arguments, in particular tradeoffs and benefits when people are enhanced, and whether or not one’s personal identity can be preserved after one is enhanced.
4.2.1 Becoming Posthuman: An Alternative Superintelligence in the Individual

In his article with Anders Sandberg, Bostrom looks at human enhancement in light of human evolution, specifically tradeoffs and benefits.\(^{286}\) In an alternative to Bostrom’s argument that superintelligence can only be realized in artificial, i.e. nonorganic entities, is that over a period of decades a set of genes has been found that most influence human intelligence. In the future they project that a therapy will be developed to enhance those genes in zygotes during the first trimester. In conjunction with this, an interface with specialized software has been developed to stimulate the neuro-synapses, and a nutritional therapy has been invented that will enhance and increase the vitamins and minerals that are especially efficacious to the brain. Because of this, children are born with an advantage of at least eighty IQ points above the current high average. Thus, 150 has become the average IQ and 230 is the upper extremity. The absorption of information by the people with this enhancement has grown exponentially, and common lessons are acquired at a faster rate. These individuals tend to be less dependent on the hypocrisies necessary when interacting with the natural (non-enhanced) person such as the pretense that all persons are equal in most ways that matter and that everyone is similarly motivated, and when interacting among themselves. However, natural persons find interacting with superintelligent persons difficult because enhanced persons tend to question even the smallest of interpersonal requirements. They tend to speak from a fact-based foundation, hence they are hyper-rational in their thought process. Emotion is not missing from these persons; it is experienced quite intensely, in the almost oceanic way of the self-actualized person of Abraham Maslow’s theory, but emotion is outwardly controlled.\(^{287}\) This is because quite quickly these persons have learned both through observation of natural persons and their interactions with them, the damage that can be done and the irrational behavior that often presents its self when
emotions are too freely expressed. They understand human emotions and do not work for conflict, but they do not let it muddy or overwhelm their interactions. The lack of demonstrative empathy may not be a desired attribute but this illustrates Bostrom’s point that the results of enhancement may not be what we envisioned. Bostrom brings up that the question that might be asked here as to whether these enhanced persons are themselves. Have their personal identities been compromised since they are more like Star Trek’s Vulcans and androids? Bostrom’s answer is that they are themselves. A posthuman person would retain all of their memories, goals, unique skills and many other important aspects of his/her personality. This would be the case if one became cognitively posthuman through the whole brain prosthesis mentioned above, and certainly in the case of humans who are posthuman from birth; when they are born they would be clean slates and would become themselves as they lived their lives. J. H. Brooke in critiquing the 2004 Templeton Prize lecture by Dr. K. Polkinghorne also made reference to personal identity in reference to enhanced persons via genetic intervention. He uses David Hartley’s and Joseph Priestly’s argument that the real person is in the pattern of the soul. The real person is a pattern or series of patterns that can be reconstituted in a resurrected body. In the eighteenth century this pattern was vibrations. It would be reasonable to assume that a cognitively posthuman person’s patterns could be reconstituted if a resurrection should take place. In the scenario given above the patterns will develop over the lifetime of the enhanced child.

4.2.2 Enhancements: Benefits and Tradeoffs

Whether or not any enhancement should be done, or why it has not already occurred are often the subject of intense debate. Here we will examine superintelligence in the individual in light of Bostrom’s and Anders Sandberg’s evolutionary optimality challenge and environment of
evolutionary adaptedness. The evolutionary optimality challenge (EOC) asks why we are not already designed in the way that an enhancement would facilitate. A further question asks how humanity can improve on evolution. Pure evolution has designed human beings in accommodation to a certain environment, or varieties of environments. The environment has changed. We are now in the Anthropocene era. Homo sapiens did not evolve in or for this era. Humankind needs to be changed to meet the challenges of the Anthropocene. These are the changed tradeoffs. Describing evolution, in an anthropomorphic manner, as she they state the evolution did not value the quality of her work standard in the same way that we would do. In other words, the entity that is evolution did not construct her products e.g. plants, animals, etc. to be able to change quickly in reaction to introduced variables such as pollution, disease, technology, etc. Rather she provided forms and a platform for current existence that gradually adapts to introduced variables. Then she saw no need to modify this construct. This value discordance is where we would find answers vis-à-vis the EOC. Homo sapiens can modify a system better to meet their goals than can inefficient evolution when the goals are substantially different. Superintelligence is a goal that would take evolution centuries to achieve, but because of the science of genetics and the advances in technology homo sapiens can achieve it much sooner. This is an example of breaking evolutionary restrictions. It is necessary to note that evolution has created the human brain/mind without any modern technologies or volitionary science, or human-motivated scientific experimentation. The era in which homo sapiens evolved and to which it was initially adapted, Bostrom and Sandberg refers to as the environment of evolutionary adaptedness (EEA). It is not the time or place, but the environment in which homo sapiens evolved and the environment to which it was/is adapted. Humankind was well adapted (designed) for the EEA but it may not be well adapted to the contemporary environment. An
enhancement may “retune” (using Bostrom’s term) an altered tradeoff e.g. human babies having larger brains, thus greater intelligence than most other animal species. Human babies are born helpless and require at least twenty-five years to fully mature, thus it is maladaptive in the EEA though it meets EOC standards. An enhancement may be intrinsically associated with a trait that was maladapted in the EEA, but in the modern era it can become advantageous, thus shifting the tradeoff. An example of this would be eyeglasses that double as a computer screen. In the EEA they would be a distraction that could get one killed by predators or one’s enemies in premodern times. Now they would allow someone to work while doing other things thus meeting the EOC. The justification for seeking individual superintelligence can be said to be that it is beneficial in the modern and projected future periods of the Anthropocene, because it will be an advantageous tradeoff.291

Ryan Tonkens in commenting on the theories of John Harris that prenatal genetic enhancement is a moral obligation, cited the EOC theory as a much better one because it does not make parents blameworthy, if they choose not to engage in enhancement for the unborn children.292 He makes a distinction. Parents may not be obligated to do what is most beneficial for their children, but they are obligated to do what is beneficial enough to safeguard them from undue harm. In this view normative evaluation comes from assessing the moral character of the acting agent (parent), rather than the consequences of their decisions and actions. The question simply is whether the parent, based on all the knowledge they can get about the proposed enhancement, its intended consequences and the probabilities that these consequences will be achieved, and whether the procedure and result will be harmless to and beneficial for their child, undertakes to do what is beneficial enough to safeguard that child.
4.3 Savulescu: The Need for Moral Enhancement

Rather than limiting his argument for human enhancement to physical or cognitive enhancements Julian Savulescu, along with Ingmar Persson, also recognizes a need for moral enhancement. Savulescu though a proponent of human enhancement, has become alarmed at the destructive potential of scientific inventions, usually weapons and the weaponization of harmful bacteria and viruses. Technology’s march forward and its potential to allow humanity to transform itself into posthuman beings raises both hope and excitement, and caution. Before we can decide how enhanced humans are to be dealt with in our societies, we must overhaul our common assumptions and acceptance of moral laziness. Humankind must move from limiting our practice to common-sense morality to updating and refining our moral reasoning and actions so that the tradeoffs and benefits will be appropriate to the contemporary era. The underlying psychological dispositions and intrinsic deficiencies of this common-sense morality make it ill equipped to contend with the globalism, potential overpopulation and scientific technological advances in which humankind finds itself. (Note, throughout this essay only Savulescu’s name will be used in reference to his work with Persson.)

4.3.1 Common-Sense Morality, Ego and Biases Toward Our Own

Julian Savulescu makes the statement that human beings are prone to do each other harm. We began competing with one another for the resources of the earth, and as these resources became more and more scarce the competition is primed to become even more intense. Accordingly, there are two major considerations which grow from our tendency to take the easier road to harm, (1) the capacity for harm has increased in magnitude because of technological advances and these harms can outpace actual benefits, and (2) the ways and means of causing harm are greater in magnitude than the ways of benefiting to the same degree. A highly
functioning system (like an ecosystem) can more readily be disturbed and destroyed than it can be improved.\textsuperscript{293} The common sense morality, which is defined as a common denominator of the set of moral attitudes of the diverse moralities of the earth’s human societies, has its origin in the evolution of the human species. This common sense morality is all about mitigating harm.\textsuperscript{294} Out of this, humanity has ordered its civilizations with the aim to attract big gains and simultaneously avoid big loss. A person will willingly accept a near certainty of a small loss in order to have a diminishing chance of a big gain. This is what the gaming and lottery industry is based upon. This gambling predilection again grows out of the desire to mitigate harm. Savulescu writes that whether this common sense or folk morality is “true” is irrelevant, and one should not draw norms from nature. Infact, they go on to say that there is no point to ascertaining the fallaciousness of the morality. They are not going to deduce anything about its validity. To them this irrelevant. Common sense or any other kind of morality evolved to allow people to live together and share resources as peacefully as possible. This necessarily led to people cooperating on a grander scale, and the exchange of talents, knowledge, capabilities and products. A functional way of interaction and treatment (as respect for person and property), called rights came into existence. These rights or benefits were tied to what was good for us, (usually physical in nature) and called moral rights. These later became the basis of what we call human rights. With this history of moral development in mind, I read their argument that regardless of common sense’s validity, there must be an overhaul of it and wider agreed upon morality to accommodate the technological and social changes that human enhancement will bring, to be valid. It is obvious that this common sense or folk morality has not resulted in the ending of warfare, various social prejudices, the pollution of the planet, etc., therefore this morality is inadequate for
the interaction of normative persons with either enhanced or transhumans, or next generation high technology.

Here we are introduced to the concept of possible individuals. They don’t actually exist yet, and accordingly need not be afforded any rights. These are individuals who would be created as the result of human behavior, like environmental enhancement, or technological advances. Could we harm or benefit such persons? Yes, is the simple answer Savulescu gives. If we deny them rights or harm, we could subsume their individual rights to those of other types of individuals. Savulescu views this sublimation of rights is an example of another part of what comes of common-sense morality. We are more responsible for what we commit or cause, and less for what happens because of our omissions. Allen Buchanan, in his essay on moral status in light of human enhancement treats this issue of rights (moral status) of different sorts of humans. He bases his argument on Kant’s concept of inviolability, (a) being a person automatically confers the moral status of inviolability and (b) the inviolability is a threshold concept. If these possible individuals are post-humans rather than natural humans their moral status would not necessarily be greater than that of natural humans. While inviolability cannot as both a moral and legal rule be breached, an exception for catastrophe does exist. In Buchanan’s argument the rights of the natural humans would most likely be sublimated to those of post-humans, thus Savulescu’s argument that benefits and harms to individuals or groups still holds. This is what makes this a biopolitical argument. The application of a governmental or legal concept of rights to this situation is necessary to assure that the two groups normative and enhanced humans have the same rights. Beistegui, Bianco et. al., in The Care of Life: Transdisciplinary Perspectives in Bioethics and Biopolitics, refer to this as wellbeing, not just medically but also the system through which this wellbeing, be it social, physical, educational,
etc. is legitimized and provided for. In essence it is how economic, seen as the way value, means of acquisition and distribution, and the physical, social, etc. lives of beings, in this case humans, come together. The aim is having everyone enjoy the same benefits, and be exposed to the same possible harms. The unanswerable question here is will transhumans acquire greater rights than normative humans. Will they be as egocentric as Savulesu believes normative humans to be?

Humans are egocentric and as such tend to be concerned for their near future, and themselves and those who are closest to them. Savulescu calls this our moral psychology. The bias toward the near future expresses the fact that people will look ahead only toward a short period of time. It is evolutionary; the ancestors of humans had to concern themselves with the immediate needs of food, safety and shelter, thus making long-range planning something that was impractical. Events that are too far in the future have much less of a chance coming to fruition than those in a shorter window of time. It is entirely rational not to be very concerned by those things the occurrence of which are not highly probable. While the above is about the closeness of future events it is not limited to the near future. It is also about proximity. We are more concerned about our immediate family members undergoing hard times, than we are about a distant cousin. We tend to be empathetic and helpful to a friend who lives in the same town with us, and a bit cool to the problems of a friend who lives thousands of miles away. This, of course, may depend upon how close a friend the one thousands of miles away from us is to us. A stranger dying in our basement could readily arouse our concern simply because they are in our home, and in intimate proximity to us. If we take the proximity argument up to the level of groups then we must note that members of a religious group tend to be concerned for the wellbeing of the members of that religion in other countries. The same is true for members of
ethnic, national, etc. groups. However, too many people suffering in too many places overload us. We usually cannot raise a proper moral response in these cases. There are too many subjects. As the number of persons who need the aid increases, the amount of aid we give to people decreases. I would argue that even though certain exceptions and particular relations need to be accounted for, the proximity theory is valid. The addition of kinship into this mix adds another variable to this theory.

Another part of this moral psychology argument that Savulescu makes concern kinships. We are more altruistic to our kin than we are to others. It cannot be said that this is solely because we come from the same genetic pool. We are intimately familiar with them. We have lived with them, talked with them, interacted in other ways with them for long periods of time. The fact that these relationships tend to begin in childhood certainly informs them to a great extent. Adopted children and friends (especially those we hold from childhood) are also a part of this kin altruism group, because the relationships and interaction have been over long periods of time. How would this bias toward our own work if there were post-humans to deal with? Savulescu would posit that there would be a bias against them because they will be different from us. They could exploit our generosity (benefits). According to Savulescu suspicion toward these post-humans, in light of kin altruism, would be warranted because we would try to better them in the competition for resources. Only by interacting with post-humans over an ample period of time would we get to know them and cooperate with them (and they with us), thus overcoming this kind of xenophobia.

4.3.2 The Liberal Democracy and Rights

The sort of country in which post-humans could be more readily accepted, it is believed, would have a government that is a liberal democracy. In a system of liberal democracy all
citizens have equal rights and liberties, with government interfering in the exercise of those rights only if those rights are in conflict between citizens, and in the case of extreme catastrophe. These rights pertain to the ownership of property, equality before the law, freedom of the press, speech, religion and assembly. The assumption is also that a liberal democracy will have a market economy, and that people will be able to freely pursue their own course in life. Lastly, fundamental to a liberal democracy is the ability to determine who will lead government. John Rawls points out that social and economic inequalities are endemic to this system, but they could be expected to generally work to the advantage of most people. He would not necessarily consider these inequalities unjust. He assumes that these democracies will build in safeguards that will act for the welfare of the disadvantaged, and if rights are exchanged for this welfare then the moral justification is there. Here justice is just one consideration balanced against utility and welfare maximization. Welfare and justice as principles must be promoted together for this argument to work. Ultimately though the argument runs up against the fact that the democratic, socioeconomic system that is the fully liberal state, about which Savulescu is writing, is unjust. Because some have fewer natural endowments than others the tradeoffs produce injustice. Bostrom foresees a posthumanist utopia where the world is a better place because people live “wonderful lives beyond imagination”. There are obvious questions related to these wonderful lives beyond imagination. The first is whether every post-human will be enhanced in all the same ways, and the second is if not will all enhancements lead to the ability to live these lives. All of this goes to the notion of well-being; of course an individual decides for themselves what well-being is to them, but in the political sphere Savulescu points out equality has intrinsic value only when it is valued in direct relation to something. That something for the purposes of this argument is well-being. Well-being comes from the meeting of socioeconomic needs, as well as
freedoms and rights. If one cannot eat or is homeless, one cannot enjoy well-being even if one has the right to vote. In liberal democracies, which the author views as a lesser form of utopia, an acknowledgement has to be made that a person’s well-being will be strongly effected by their natural capacities and intellect. Egalitarians may want to push for the enhancement of individuals who are seen as disadvantaged, as hard as they push for equality of opportunity. People tolerate a certain amount of inequality. In a highly technological age equality and indeed inequality can exist simultaneously.

4.3.3 Ultimate Harm and Destruction of The Commons

Two broad issues have been the primary motivation for Savulescu’s belief in the need for moral enhancement. These are the rise of weapons of mass destruction and the climate crisis, i.e. global warming caused by human activity. Now too many people have access, or can gain access to weapons of mass destruction. Over the last century nation after nation has manufactured or bought ever more complicated and powerful weapons. Often the mentality that drives this acquisition of weapons is fear of a more powerful nation, or simple competition for the most powerful killing machines. Another wrinkle to this phenomenon is that smaller groups can get control of these weapons and cause the deaths of thousands of people at one time. This is called the state of Ultimate Harm, wherein worthwhile life on this planet is rendered impossible because there exists the state where great numbers of human and other sentient life can be eliminated at any time by small groups or an individual with access to weapons of mass destruction.\textsuperscript{305} As we saw in Rwanda, one ethnic group armed with better weapons and powerful propaganda, was able to effect the genocide of another ethnic group. Because of the fact that we are egocentric and have kin altruism, and we have a bias for short term action and helping those who are closest to us in proximity, it was a long time before the more powerful western nations
responded to the killing. This may happen more often now. Nuclear, biological and chemical weapons are now available to nations, terrorist groups and individuals who are wont to do harm, and it seems more apt to take place unless moral enhancement is widespread.

The consensus now is that it is too late to mitigate our negative effect upon the ozone, and hence prevent the warming of the planet to remain less than two degrees Celsius. This has come about not just because of the use of fossil fuels, though the impact of their use has certainly been substantial. Methane gas has been released because of the herding agriculture (beef and dairy cows, pigs and hogs, and sheep), and the melting of the permafrost. Lumbering has led to rampant deforestation and thus the elimination of essential carbon sinks. Chemical compounds like PCBs and various fluorocarbons have also contributed to global warming. Since the beginning of the period known as the Industrial Revolution, pollution of the sea, land and air has contaminated nearly every part of the planet. Chemicals such as pesticides and fertilizers have invaded our bodies. Through our fixtures and building materials, like lead and asbestos, we have been sickened. Employment in industry has also caused the development of diseases such as black lung. Because we strip the earth for our needs and, sometimes, frivolous desires various flora and fauna have gone extinct, or are endangered. Virus like ebola have come out of the jungles. Dengue fever, zika, have moved into the Northern Hemisphere as the earth has warmed, as have army ants and other potentially dangerous insects. Yet people are unwilling to modify their behavior to the degree that is necessary to stop global warming, or seriously curtail pollution. Nations want to develop along the lines of the Global North, and their people want to live like the people they see in Western television programs and movies. Savulescu uses herdsmen and overgrazing to illustrate the point that people being so numerous, and nations
having their competing interest cannot readily come together to do what is necessary to stop them from destroying their livelihood.\textsuperscript{306}

Savulescu writes about the physicist Stephen Hawking’s having conducted an internet survey in 2006, in which he sought to find out what people thought were the greatest threats to humanity, and what could be done to ensure humanity’s hundred-year survival. After a while Prof. Hawking told a story. In this story humankind has not yet been visited by aliens because it has reached the unstable stage of development. Worlds at this stage tend to destroy themselves, so they have to expand into outer space if they want to survive. Hawkins says it will take at least one hundred years for this to happen, so humanity needs to be very careful. We also need to try to use genetic engineering to make us wise and less aggressive.\textsuperscript{307} How we become wise and less aggressive so that humankind does not destroy itself either by violence or climate change is the whole point of the need for moral enhancement. Liberal democracies have begun the process with the COP and the international agreements, culminating in the Paris Accords, which the United States and China have agreed to. (The current president of the United States has abrogated the Accords and the U.S. will leave the agreement by the end of 2020.) The aim is a reduction in greenhouse gases destroying the ozone and rapidly warming the planet. The liberal democracies are trying to inculcate the norms that will bring about prosperity and survival of the world-community, of which they are a part. This has to be done within social liberalism which is rife with tradeoffs and benefits, that must be neutralized in favor of a globally responsible liberalism extending welfare concerns globally, into the indefinite future. They have failed so far, but the human rights jauggernaut continues to drive forward.\textsuperscript{308} Moral enhancement done through scientific techniques, usually genetics and neurobiological exploration is called moral bioenhancement. This along with continued moral education, would be used to strengthen
altruism and the sense of justice. Altruism, by Savulescu’s definition, is composed of empathy, the capability to imagine what it is like to be another conscious subject and feel its pain or pleasure, and sympathetic concern about the well-being of the subject for its own sake. Baron-Cohen puts it more clearly, speaking in reference to women being more altruistic than men. One who has empathy must be able to feel, perceive, and think the way another does. They have to be able to put themselves in another’s place. Further, Baron-Cohen suggests that men could be made more moral by biomedical methods, i.e. more like men who are more like women in reference to aggression and sympathy, but without the tendency to social forms of aggression. Savulescu takes this same tack with children. He suggests that they should be given moral bioenhancement, just as they are given moral education. Bioenhancement has its critics. A general criticism is that bioenhancement corrodes freedom and moral responsibility. John Harris believes that moral bioenhancement will cause humankind to become mindless robots who react without reason. He continues that it will become impossible to do immoral things, because free will would be curtailed. Our ability to refrain from immoral acts because of legal, moral and prudential reasons is taken away. Harris invokes Milton’s Paradise Lost lamenting the morally enhanced lack of “freedom to fall”. Put another way, because the morally bioenhanced won’t be able to behave immorally, they cannot decide to not behave immorally, and thus cannot be lauded for their morality. They could not morally fall. Harry Frankfurt challenges Harris with this thought experiment. A person weighs whether to do an immoral thing, by means of pros and cons. They decide to do the moral thing. This person also has a mechanism in their brain which would kick in to prevent them making an immoral decision. The person is not free to fall, but the decision to act morally is laudable. Savulescu posits that morally bioenhanced people are not automotons. They are not like the pyromaniac incapable of resisting the urge to act immorally.
They would be enhanced so as to be the same sort of person as the naturally virtuous person. The strength of the desire to do the morally right thing will be in proportion to the reasons one has to act morally. They will not always do the right thing.\footnote{309}

4.3.4 Why Moral Enhancement is Necessary, Applying the Moral Enhancement to Interaction with Post-Humans

Should we interact with post-humans using the same framework of rights, responsibilities, liberties and assumptions we use in our interactions with fellow natural humans? Both Bostrom and Savulescu would reply in the affirmative. Allan Buchanan fleshes out the argument in “Moral Status and Human Enhancement”. Human rights are rights humans have by virtue of their humanity. This implies that these rights need not be recognized in law; they are natural rights, and this also implies that these rights are universal and inclusive, not limited to any subset of human beings. The human rights we now have reflect the way we are now biologically, in the interests we have, and threats we face in light of the institutions we live under. In other words, human rights reflect our development and our responses to our current natural, cultural, social, economic and informational environment. What matters when it comes to human rights is the capabilities and interests an individual has, and an individual having more of these interests and capabilities is irrelevant. Buchanan goes on to write about a respect-based account of moral status and considerability; he cites Immanuel Kant’s philosophy in its explanation. Respect-based account comes out of Kant’s philosophy. In it all beings who have certain capabilities have intrinsic moral worth that confers inviolability. Degrees of moral considerability don’t work in this account. All beings who meet the standard of this account are owed equal respect, and there is no difference in moral status.\footnote{310} This is essentially the moral
equality assumption all beings having the characteristics sufficient to being a person are equal in moral status.\textsuperscript{311}

Post-humans are advanced in moral, intellectual and/or physical ways. They may have more self-control and empathy. They are better in many ways so it may be assumed that they will become the dominant type of human. It does not follow that they would automatically regard natural humans as inherently inferior and feel justified in enslaving and otherwise discriminating against them. The current human rights regime would offer some protection to natural humans. It is the author’s position that we cannot know what the post-human person will ultimately be. Those who look fearfully on human enhancement use the eyes and practical reasoning (based upon commonsense) that is limited to their reasoning faculties and abilities. Auke J. K. Pols and Wybo Houkes give a thorough explanation in their article about the moral salience of enhancement technologies. Humankind considers practical reasoning as determining what one would like things to be, and the means to bring this end into being. In other words practical reasoning allows us to create a desired state (an end), and construct a set of actions (means) to bring that state to fruition. Pols and Houkes outline three attributes of practical reason that are fundamental to this discussion. The first is situation. Practical reasoning springs out of real or perceived needs that come out of practical situations. The second attribute is embodiment. Human mental and physical skills are required. The last attribute is limited capacity. Humans always consider only a limited range of means to reach their ends, usually on the basis of flawed information.\textsuperscript{312} Bostrom’s conclusion that individual superintelligence is impractical in any near future is based upon scientific knowledge, and will be modified in accordance to further scientific developments. The conclusions of Anas, Harris and others are not based upon a firm foundation. They are based upon philosophy and history, not upon any knowledge of radically
enhanced humans. They have no experience of posthumans. The philosophical argument is based in history and Western philosophical thinking. (Ryuichi Ida and Susumu Shimazono are the only non-western essayists in Savulescu and Bostrom’s opus Human Enhancement.)

Posthumans who are enhanced to the degree that they may be another human species do not walk the earth. We can only speculate, but these enhancements will help these individuals transcend practical reasoning because they will be able to develop more material means for achieving ends.\textsuperscript{313} The very enhancement that they have may act as a facilitator itself. The ends are the things that must come under moral scrutiny, not that posthumans have a greater capacity for developing options to choose among. Enabling and facilitating are central features of Pols and Houkes. These posthumans, because their enhancement is permanent rather than episodic, i.e. able to be turned on and off, will transcend the boundary (embodiment) of practical reasoning. Because the enhancement is permanently a part of the agent they may (prosthesis), or may not (genetic modification) have control over it as human beings commonly know control, and thus they may or may not be responsible for that control. The posthuman will have a much larger cognitive capacity so they will be able to deliberate to a greater depth within a small number of options for achieving ends, and/or devise a much larger number of possible options among which to deliberate.\textsuperscript{314}

**Conclusion**

Human enhancement will come. It is here. The question both Nick Bostrom and Julian Savulescu, and other liberal transhumanist thinkers are both posing and attempting to answer is what will be the biopolitics surrounding the existence of posthumans. Since biopolitics is grounded today in law, ethics and politics this is the ultimate discussion that concerns the interaction between the natural human and the posthuman. They are both beings. They are both
persons. Bostrom has argued for cognitive enhancement, and given us the Terminator Theory, when this sort of enhancement is taken to its fantastical conclusion. He also in arguing for the cause of human enhancement has shown its greater cognitive capacity can make for a better life for all humans and other species, because greater cognitive capacity allows for better insight, better making sense of inputs, and is a better tradeoff than limited cognitive capacity.

Savulescu went further with the concepts of tradeoffs and benefits; he fiercely argues for moral enhancement. It is imperative because to date humanity has taken too long to learn the lessons of humanity’s bias in favor of the near future, bias in favor of one’s own, bias in favor of the local and bias in favor of the familiar. His proposal to enhance altruism and the sense of justice will be the basis of a morality, and indeed an ethics that will allow natural and posthumans to interact successfully. However, natural humans will need to moderate their fear, and create the kind of world that will welcome what will be other human beings, so that they will go on together is that near utopian future transhumanist foresee.
THE ETHICS OF GENOMICS REGARDING THE POSSIBILITY OF DESIGNING BABIES

Introduction

The question of how much control potential parents should have over the attributes of their offspring has become increasingly important because of the development of new technologies and therapies that allow for the performance of prenatal surgery, the modification of the genetic coding of blastocysts, and the cloning of individual persons. Prenatal surgery has given babies with debilitating conditions the chance of a normal childhood and adulthood because the natal barrier is able to be breached. Heart and other organ defects are now correctable, if they are found and the natural further development of the fetus can assist in the healing process.

Genetic technologies open the door for therapy even wider. Amniocentesis, which uses a needle to draw out amniotic fluid to assess potential fetal abnormalities, usually something like Down’s syndrome, can be seen as the first prenatal intervention that gave parents the ability to choose what kind of child they wanted to bring into the world. The potential offered by genomics exponentially increases this ability. DNA, located within our genes, along with RNA are the bits of amino acids that allow genes to create us. Mitochondrial DNA (mtDNA) diseases, such as myoclonic epilepsy with ragged red fibers (MERRF), has spurred the development of mitochondrial replacement techniques (MRT), both spindle transfer (ST) and pronuclear transfer (PNT).

Preimplantation Genetic Diagnosis (PGD) and CRISPR technology are both further expansions, like the mitochondrial techniques cited above, of amniocentesis in that they search for and in MRT, and CRISPR eliminate abnormalities in the genes of blastocysts before they are
even in the womb. This is where fear has begun to grow in people’s minds. What will these therapies at the natural conclusions produce? Will what they produce even be human? If eggs from two women are used does the child have three biological parents?

If cloning is added to this mix then monsters are imagined: Frankenstein’s creature. Television shows like Orphan Black show mostly agreeable clones. (The neolutionists are the evil ones.)\textsuperscript{317} Still, the United States and other governments have banned the cloning of human beings. Both CRISPR technology and MRT for a time had been banned, but because of earlier scientific testing, and the potential for disease prevention regulations have been relaxed and open trials are being conducted. All of these technologies and therapies will be explored in this treatise, and the ethical concerns that accompany them will be treated. Transhumanism, the philosophical concept under which these technologies fall because of their ability to potentially affect the germline of homo sapiens will also be explained. (A justification of transhumanism has been explicated in a former chapter.)

5.1 Preimplantation Genetic Diagnosis

Amniocentesis allows potential parents to find out some of the abnormalities that their embryo(s) may have. This testing, however happens after embryos have been formed. It does not happen at the blastocyst stage, and intervention can happen no sooner than the end of the first trimester and into the second trimester. Something more efficient was needed, and this is found in a technique called preimplantation genetic diagnosis.

5.1.1 PGD: The Science and the Technology

Preimplantation Genetic Diagnosis (PGD) and preimplantation genetic screening (PGS) take place before the blastomeres are implanted in the womb.\textsuperscript{318} In the process the couple undergoes
in vitro fertilization (IVF). This is necessary for the PGD/S process of biopsy. After fertilization, the blastocyst develops into the cleavage-stage. A blastomere is removed on the third day for testing. Normal blastocysts are transferred from the growth environment to the uterus so they can implant, beginning a pregnancy. The aim of this process is to assess whether a genetic abnormality will be transferred to the next generation.\textsuperscript{319} It is also undertaken to improve the chance that offspring will not inherit the genetic abnormality of their parents.\textsuperscript{320}

The evaluation is done using polymerase chain reaction (PCR), fluorescent in situ hybridization (FISH), and comparative genomic hybridization (CGH). PCR is used primarily to assess single gene defects. Another word for this technique is DNA amplification. The analysis is achieved by copying a particular DNA sequence many times, thus multiplying one DNA molecule into billions.\textsuperscript{321} Determination of sex for assessing X-linked diseases, chromosomal abnormalities and aneuploidy (condition in which the number of chromosomes are greater or fewer than is normal) screening is done using the FISH technique. It is done as the secondary in PGS. Small pieces of DNA that match the chromosomes being under analysis, called probes, bind to a particular chromosome. Each probe is dyed a different fluorescent color. After being added to the biopsy, the number of each color is counted. Cells both with aneuploidy and without can then be distinguished.\textsuperscript{322} In CGH the blastomere nucleus is labeled with a fluorescent dye, and the control cell is differently dyed (i.e. red, green). The cells are cohybridized on a control metaphase spread, and color ratios is compared. Too much red indicates an extra chromosome, and too much green means the blastocyst is missing a chromosome.

While PCR assesses one chromosome at a time, and FISH does 7 to 9, CGH enumerates 23 chromosomes, and provides a fuller picture of the entire length of the chromosome.\textsuperscript{323} PCR and FISH, both of which use limited chromosomal material cannot meet the needs of whole
genome research. Whole genome amplification (WGA) was developed to overcome these limitations. The technique amplifies a cell’s entire genome to microgram level, considering original sequence representation. Enough DNA can be amplified so as to allow for the diagnosis of any known single gene defect that would otherwise be impossible, and multiple tasks requiring abundant DNA can be performed from WGA products.\textsuperscript{324}

Robert Edwards and Charles Gardner performed the first biopsy of rabbit embryos in 1968, and PGD was developed in the United Kingdom in the mid-1980s. It was initially used to determine gender so that this knowledge can be used to avoid X-linked disorders. As of 2006, more than 15,000 PGD cycles have been reported, and is currently available for most known genetic mutations.\textsuperscript{325} The primary candidates for whom PGD is indicated are, (1) parents with a family history of X-linked maladies, with a 25% risk affected embryos, and half of male embryos, (2) parents with chromosome translocations, causing implantation failure, mental or physical problems in children, and recurrent pregnancy loss, (3) carriers of autosomal recessive diseases, with a 25% risk of affected embryos, (4) carriers of autosomal dominant diseases, with a 50% risk of affected embryos.\textsuperscript{326}

Data concerning the success of PGD has been studied in Europe and the United States, and the results have been promising but not as great as expected. A successful outcome of PGD, i.e. a healthy baby, according to the data reported in Human Reproduction, collected by K. D. Sermon, A. Michaels, et al, is dependent on the genetic condition found (sex X-linked, chromosomal rearrangement, autosomal dominant or recessive).\textsuperscript{327} The proportion of unaffected embryos will vary with the inheritance of the disorder. Even in fertile couples, successful results have been less than optimal. That is because the available embryos must survive biopsy with good morphology, and genetic disorder free. This greatly lowers the number of viable embryo
Success is more closely related to embryo volume available for biopsy. This is dependent upon the number of high quality eggs found after gonadotrophin stimulation. This high quality volume declines as women age. A pregnancy rate of 25% can be achieved.

In the United States, because PGD involves IVF as well as manipulation of non-implanted blastocysts, it is classified as a means of assisted reproduction. The process falls under the title of assisted reproductive technology (ART). The term ART encompasses any procedure that causes embryos and/or oocytes to be handled in a laboratory for the purpose of establishing pregnancy. The Fertility Clinic Success Rate and Certification Act (FCSRCA) requires every medical facility in the United States that performs ART procedures to report data to the Centers for Disease Control and Prevention (CDC), for every ART procedure that is initiated. The results of these data are mixed. For women who were younger than 35 regardless of any of the indications cited above, use of PGD was not associated with a higher rate of pregnancy or live-births. When it comes to PGD for aneuploidy screening, among women who were older than 37, it was associated with a higher probability of a live-birth delivery per transfer, and the live-birth deliveries were more likely to be multiple births. Among women younger than 35 PGD was associated with lower odds of clinical pregnancy and live birth, than when PGD was not used. PGD among women aged 35 and older, was associated with lower rates of miscarriage and improved rates of live-birth and multiple births.

5.1.2 Ethical Issues and PGD

Three main objections have arisen with the advent of this technology. The first concerns the principle of justice. The question is whether this technology will be available to prospective parents in all socioeconomic groups. I will start with The National Health Service because the UK was the only country that ran this program without social or economic variables for inclusion
The second ethical issue that arises from PGD is the so-called savior sibling. The technique of human leukocyte antigen (HLA) matching is used to facilitate the evaluation of blastocyst for potential stem cell or bone marrow match. HLA can be used to exclude a genetic disorder, but it can also be used to provide a potential donor for an affected child with recessive diseases, such as leukemia and thalassemias. Of note is that HLA has been used to prevent the birth of a child with Fanconi anemia, which is an autosomal recessive disorder, whose cord blood stem cells were transferred into the affected sibling. The sibling was cured. The question here concerns the rights of the savior sibling. The child born so that another can be cured could not give informed consent to their being used in this manner. They could not have agreed to
being created for, as it were, spare parts. Advocates of the creation of these children would argue that no child gives informed consent to birth, and that these siblings are not discarded once they have performed their “duty”, but are whole family members.

Frances Flinter pairs HLA with PGD as pointing to the last objection, the creation of a regime of designing babies. From sex selecting to allowing family balancing to every other form of in vitro enhancement, Flinter argues for tight regulation of these technologies so that babies won’t become made-to-order products for parents. She argues that the standards should be international in scope. If they are not then maverick practices in various nations can bring all these techniques into disrepute.  

5.2 Mitochondrial (mtDNA) Disease and Replacement Therapies

In this section the case of Charlie Gard will be used as an example of where PGD could have been efficacious, and mitochondrial replacement therapies will be explained.

5.2.1 The Case of Charlie Gard

In October 2016, a baby boy called Charlie Gard was admitted to Great Ormond Street Hospital (GOSH); he was the son of Connie Yates and Chris Gard. After examination Charlie was diagnosed with mtDNA Depletion Syndrome (MDS). A baby born with this syndrome means that the gene which protects the mitochondria is missing from the DNA supplied by both parents.  

It usually manifests before the child’s second birthday as muscle weakness. Then it moves to organ failure and difficulty breathing, swallowing, walking, etc. Respiratory failure due to lung infection is the usual cause of death. So far the common manner of treatment is supportive therapy, though experimental therapy is being tested in the United States.
On July 28, 2017 Charlie Gard died in hospice, seven days short of his first birthday. This case centers around the issue of futility in medical care: who should have the final say in cessation of care? Should doctors be allowed to usurp parental prerogative regarding experimental treatment options and end of life issues? Because mitochondrial replacement gene therapy is to a degree available should not prenatal testing have been done, so that this outcome could have been avoided altogether? British biomedical law allows doctors to decide when treatment is futile, and should be discontinued. The term futile refers to a condition in which physiological systems are so compromised that no known medical intervention can lead to a successful outcome. In this case doctors at GOSH decided that further medical intervention for Charlie was futile, and was potentially harmful to him. For six months several court hearings were held, in both United Kingdom and European Union courts. The GOSH doctors prevailed.

Charlie Gard’s parents, since November of 2016, had been trying to get GOSH to allow him to travel to the United States for an experimental treatment that has been shown to improve the health of another child with a different mtDNA disease. They raised $1.8 million toward this end. The doctors in the U.K. blocked this. In early July 2017 Dr. Michio Hirano, of Columbia University Hospital, came from the U.S. to examine Charlie and meet with the hospital staff. In the end both Dr. Hirano and the GOSH staff agreed that it was too late to make a difference, and reported the same to the court. Chris Gard concluded that all of the back and forth with the hospital and courts caused the window of treatment for Charlie to close.

5.2.2 Mitochondrial (mtDNA) Disease and Mitochondrial Replacement Techniques (MRT)

A. E. Harding in “The Other Genome” writes about the importance of mitochondria. They each contain from two to ten double stranded circular DNA molecules. Mitochondrial myopathies and encephalomyopathies, and Leber’s hereditary optic neuropathy are linked to
large deletions and point mutations of mitochondrial mtDNA. Deletions in the mitochondria are associated with Kearns-Sayre syndrome, ophthalmoplegia, conductive cardiac defects and ataxia. Charlie Gard’s illness fell into this category. Pearson’s syndrome, is a disorder composed of neonatal hepatic and pancreatic insufficiencies, lactic acidosis and pancytopenia.\textsuperscript{344} There are over a thousand proteins in mitochondria so the genetic causes of the diseases associated with the mitochondria are variable.\textsuperscript{345} Multiple copies of the mitochondrial genome are present in each cell from one thousand in somatic cells to nearly one hundred thousand in oocytes. Mutations in mtDNA can occur at the germline, particularly in oocytes. Mitochondrial DNA mutations can occur in a subset of the total DNA pool, due to the high number of mtDNA copies, resulting in mtDNA heteroplasmy. The last two decades have led to a realization that the ratio of wild type DNA to mutated DNA in the cell is a determining factor in the severity of disease.\textsuperscript{346}

Two procedures have been developed to avoid mitochondrial disease not only in the resulting offspring, but the protection will be extended to subsequent generations. The first procedure is called pronuclear transfer. It is the process of transferring of the pronuclei of both sperm and ovum, from a zygote in which there are mtDNA mutations, into the perivitelline space of a donated enucleated (without nucleus) zygote. The pronuclei are fused with the enucleated zygote using inactivated hemagglutinating virus of Japan, or electric pulses. The resulting zygote then contains the nuclear DNA material from one zygote, and cytoplasm and mtDNA from the other.\textsuperscript{347} In spindle transfer the spindle with the mother’s chromosomes attached is transferred from one unfertilized zygote to an enucleated zygote. The new oocyte is then fertilized so that embryos will develop. Pronuclear transfer was first developed in mice, while spindle transfer was first successful in nonhuman primates.\textsuperscript{348} In animal studies which include nonhuman primates, no abnormalities have been seen long-term into adulthood. Three safety issues have
been manifested because of both of these techniques: methods of avoiding abnormal fertilization, possible nuclear-to-mtDNA incompatibility, and reduction in the amount of mutated mtDNA carryover. The rhesus monkey spindle transfer results were promising, but human studies illustrated a higher rate of abnormal fertilization. Yet, the yield of normal euploid spindle transfer blastocysts per ovarian stimulation cycle was enough to be useful in a clinical setting.

5.2.3 Ethical Considerations of Mitochondrial Replacement Techniques

The ethical questions that MRTs inspire include: Can a person who has been created through MRTs have a full open identity? Can embryos be used for research and discarded? Are egg donors being exploited? Can we be sure that the children that result from these techniques grow up safe and healthy? What affect will three parent offspring have on genealogical research? The ethical question of identity comes from the fact that offspring will be made among three parents instead of two. Francoise Baylis’ argument is that identity is not just constructed of genes, but it is a construction of genetic expression, life trajectory and the environments in which we live. One’s relationships with others also contribute to this construction. The Nuffield Council argues that the donor egg in the process does indeed contribute to the identity of the resulting person, because he/she cannot become the person he/she would have become with just two parents. As far as genealogical research is concerned all three parents’ DNA could be examined so that accurate delineation could be obtained. According to the Institute of Medicine’s report Mitochondrial Replacement Techniques: Ethical, Social and Policy Considerations, though these considerations will come up they did not present an impediment to initial investigation of MRT.

The creation and destruction of embryos for research purposes poses one of the thorniest dilemmas for both the scientist and the ethicist. There are those who argue for usually religious
reasons that destroying unused embryos is the same as murder, especially when the embryos are fertilized. However, if the spindle transfer technique is used the donor oocytes does not need fertilization, which would make the whole question moot when it comes to medical treatment.\textsuperscript{354} Both the report of the Institute of Medicine, and the Nuffield Council on Bioethics stated that MRT should continue to be studied, with Nuffield going further and allowing the procedure in the U.K. for the avoidance of mitochondrial diseases.\textsuperscript{355} On December 18, 2015 an appropriations bill was signed into law, containing a rider forbidding the FDA to consider applications for exemptions to allow research on human embryos created specifically or modified to include heritable genetic modification.\textsuperscript{356}

Whether oocyte donors are being exploited, and whether they should be paid pose the last large ethical questions that can be considered here. (Whether or not offspring made this way will be healthy can only be assessed after they are born and live their lives.) Donors, as is the case with any medical procedure, must be advised of all that is involved in the process, and they must willingly agree to participate. This falls under the principlistic concept of patient autonomy. It involves informed consent, when a person gives “autonomous authorization” for research participation or medical intervention.\textsuperscript{357} As far as pay-for-service goes in the U. S. some states, like California ban paying donors, but that is not uniform by law.\textsuperscript{358}

In the U. S. the question of germline succession has been an especial worry to varied interest groups. The speculation range from the inadvertent creation of nearly thanatopic waifs to Frankenstein babies. The Institute of Medicine report is based on cooler rhetoric and caution. Because of unknown potential risks and abnormalities, implantation of these modified blastocysts should be limited to male embryos.\textsuperscript{359} However, the door to the future is left open. Female embryos may be implanted in the future if the procedure with male embryos proves to be
safe and successful, animal trials have shown intergenerational safety, and the decisions of the FDA (Food and Drug Administration) were in line with the outcomes establishing an acceptable moral framework for heritable genetic modification, arrived at through scientific and public deliberations.\textsuperscript{360}

5.3 Intentional Genetic Modification and CRISPR Technology

For the enhancement of humans to occur there must be intention. This section will further explore the techniques that do and will allow this intentional genetic modification to happen.

5.3.1 After PGD and MRT, CRISPR-Cas9

All of the techniques discussed in this chapter, indeed in this dissertation, deal with the process and technicalities of enhancing human beings via the intentional modification of genetic code (IGM). What often informs the thinking of those who are frightened of and/or opposed to all of these enhancement therapies is the possibility of adverse results either to the individual or the species.\textsuperscript{361} Buchanan suggests that this fear has three general components First, unlike with other forms of biomedical enhancement, genetic modification poses a great threat to the species.\textsuperscript{362} The simple answer to this is limiting its use. Second, the belief is that any adverse outcome of IGM would be irreversible. Scientists already know how to contain the expression of these manipulations within their laboratories. There also exists the possibility of pharmaceutical containment of these expressions.\textsuperscript{363} Third, the fear that human beings will be biologically changed forever causes certain quarters to call for a total moratorium on such technology.\textsuperscript{364} If any change is made to the germline the change would be limited to the offspring of the host parent. Total prohibition of the technologies, use of an overarching principle of risk-reduction,
and a combination of cautionary learning strategies that are adaptable to risk, and gaining of knowledge about risk assessment are all possible scenaria.  

In his chapter entitled “Genetic Therapies: Post-Human”, Dr. Siddhartha Mukherjee writes that even after the development of the successful technique for PGD doctors and geneticists operated within what he calls the “triangle of boundaries … highly penetrant genetic lesions, justifiable, noncoerced interventions, and extraordinary suffering”. Then, in the 1990s, gene therapy became possible, opening the door to positive eugenics. Genes could now be modified limited to nonreproductive cells, e.g. blood, muscle etc., not effecting successive generations. However, that was not the only door that was opened. Genes of reproductive cells could also be modified such that what happened in a germ cell would be passed on in the genome of the progeny.

In the mid-2000s, Rodolphe Barrangou and Philippe Horvath of Danisco, a Danish food company, discovered a biological process by which bacteria defended itself from viruses; they were working on cheese producing and yogurt making bacteria. The process involved a seeker, which is an RNA (ribosomal nucleic acid) in the bacteria’s genome. It matched and recognized the DNA of the enemy virus. This seeker could do this because it was the mirror image of the invading DNA. It was binding. The second actor in this process is a hitman. When the seeker identifies the invader, then the hitman, which is a bacterial protein called CAS-9, delivers a lethal cut to virus’s gene. This could be called the birth of gene editing, intentionally modifying the DNA to produce a desired effect. In 2012, bacteriologist Emmanuelle Charpentier, and researcher Jennifer Doudna realized that this process could be programmed. The seeker could be changed depending on the DNA to be targeted.
Further manipulation can be done because when the gene is cut there are two loose, or severed ends. The space between those ends represents missing information. The gene will seek an intact copy, so as to replace the missing information. Now, if a cell has been flooded with foreign DNA, the severed gene will copy the information in this foreign DNA. This information will be permanently written into the genome. They called this manipulated system, CRISPR-Cas9, in 2012. Although, another system to do programmable gene editing, called TALEN has been designed, the CRISPR technique has been the primary one. Sometimes the cuts are delivered to the wrong genes. Sometimes the repairs are not efficient, thus causing the failure of the rewrite. Still, it is the favored technique. Mukherjee describes CRISPR as “a method to achieve directed, efficient, and sequence-specific modification of the human genome”.372

5.3.2 CRISPR-Cas9 Experimentation

In 2016 the Human Fertilization and Embryology Authority in Great Britain, approved Kathy Niakan of the Francis Crick Institute’s application to modify human embryos with the CRISPR-Cas9 technique.373 CRISPR-Cas9 is effective on a broad spectrum as a gene-editing tool. TALENs, which has been discussed in chapter 3, is the other major gene editing technique, and its use is more limited in scope than CRISPR-Cas9. Its use is highly dependent upon what the desired outcome is. It is not effective for producing as many desired outcomes as the CRISPR-Cas9 technique.374 The voluntary moratorium that many countries have been observing was not contravened because the embryos would not be implanted in the womb. Dr. Niakan’s experiments involved only letting the cells reach the blastocyst stage before they were destroyed, (about seven days). The unwanted embryos were sourced from fertility clinics. Her aim was to ascertain the switching system, (called cascade), that guides the development of the germ cells during the first stages of cell division. This may be useful in determining what happens when the
cell division process ceases before reaching the blastocyst stage. This follows the first use of CRISPR-Cas9, by researchers in the laboratory of Junjiu Huang, at Sun Yat-sen University, in April 2015. They were trying to delete the gene for beta thalassemia, but the embryos proved unviable. This triggered the moratorium.

Shoukhrat Mitalipov of the Oregon Science and Health University, whose work in creating chimeric rhesus monkeys using MRT as part of cloning research will be treated later in this dissertation, has reported the first successful use of the CRISPR-Cas9 technique in the U.S. He and his team used the technology to edit a genome to prevent a heritable disease. Whether or not the procedure was successful was not reported. They did report that more embryos were used in this experiment than are usually used in these kinds of trials, and there were fewer errors (incidences of mosaicism, off-target editing), than in previous trials. Mitalipov’s laboratory worked with colleagues in China, South Korea and California. Several foundations, the Institute for Basic Science of South Korea, and the Oregon Science and Health University funded this trial, in keeping with the prohibition that was signed into law by President Obama.

While this breakthrough will not automatically lead to the open use of the CRISPR-Cas9 as a matter of course in genetic reproductive therapies, it may go a way towards meeting the requirement set forth in the IOM report that successful and safe experimentation in non-human primates must be demonstrated before the technique can be used in clinical trials with human subjects. Success in this area would allow the door to be opened to employing the technique to create implantable blastocysts, leading to viable children. The promise of CRISPR-Cas9 is similar to that of MRT; several genetic diseases and syndromes such as BRCA mutations associated with breast and ovarian cancers, Tay-Sachs disease, sickle cell anemia, Huntington’s
disease and cystic fibrosis could potentially be knocked out using this technique. Part of the process in this experiment involved making a template of wild or introduced DNA, but in some cases sperm cells would not accept this information but instead copied the information in the egg cells. Mitalipov was surprised that the template was in fact refused, describing it as something new. Like mosaicism this anomaly has to be conquered before widespread use of the technique will be allowed.

In February 2017 a committee of the National Academy of Science endorsed the intentional modification of embryos when no reasonable alternatives exist, and only to modify a mutation that causes a severe condition or disease. Paul Knoepfler of the University of California, Davis, says that PGD is a reasonable alternative to CRISPR-Cas9, though he does acknowledge that there may be three instances where gene editing may make more sense than PGD. The first is when a parent is homozygous for a dominant mutation. In this case the parent has two mutant gene copies, instead of only one copy, then all of the embryos and children will have at least one mutant gene copy. If the mutation is dominant then all of their children will have the disease caused by the mutation. PGD would be unable to find any normal embryos, therefore, gene editing may be more efficacious. The second instance where gene editing may be called for, rather than PGD is when both parents have a mutation in the same disease-causing gene. In this case three out of four embryos would possess at least one copy of the mutation. Many embryos would have to be created to make PGD worthwhile, running afoul of ethical and, in some cases, legal prohibitions against producing large amounts of embryos that will be discarded. The last instance would be when both parents have multiple kinds of disease-causing mutations. Gene editing could be more effectively used to knockout multiple mutations. The chances of PGD being able to produce normal embryos would be most unfavorable.
5.4 Cloning

Gregory Pence in his book that explores the science and ethics of cloning, using the television show Orphan Black, makes the following essential point about personhood. The very condition of being a person that is physically identical to another person, involves a pervasive factor in their relationship, that it is “involuntary and unchosen”.\textsuperscript{385} In that way cloning is like all of the previous forms of assisted conception that this essay has treated thus far. In this case, however, the parent produces a duplicate of his/herself.

5.4.1 Cloning History and Process

Legislation was introduced allowing scientific research on cloned human embryonic cells, in August of 2000. This did not allow the cloning of a complete human being.\textsuperscript{386} That this technique has come so far as to have the permission of a government to do in depth research is an indication of the importance of genetic research and experimentation. It can be said that the road to Dolly in 1997, and this later British legislation, began in the laboratory of Jacques Loeb in 1894. He observed that sometimes fertilized sea urchin eggs ruptured, and occasionally the nuclei of a cleaving egg can cross to the extruded cytoplasmic material. Then two entire embryos were formed. Hans Spemann, in 1914, replicated this process in the egg of an amphibian.\textsuperscript{387} This, initially called nuclear transplantation, was the germinus of cloning, because it proved that the complete genome is copied in cell division in early cleavage.\textsuperscript{388}

Scientists start the cloning process by harvesting somatic cells from blood or skin of the animal that is to be cloned. A donor egg from a different animal (of the same species), is de-nucleated, and implanted with the nucleus of, or entire somatic cell. A shock is administered and the new modified egg will -sometime- begin the parthenogenesis-like process of growing into an
embryo. When implanted in the carrier womb, the embryo will grow into a cloned animal. The mitochondria of the donated egg is retained during somatic cell nuclear transfer (SCNT), and they have their own genome. This combination of mitochondrial DNA from one animal, and nuclear DNA from another causes the clones not to be a hundred percent genetic identicals. There are two types of cloning: reproductive, where the aim is to create a human being which is identical to another human, and therapeutic. In therapeutic cloning SCNT is used to make embryonic stem cells that are genetically identical to another adult, however these cells are to be used autologously, i.e. in self-to-self transplantation. The greater number of microbiologists support therapeutic cloning, rather than reproductive cloning.

There are three problems that must be considered in the process of cloning. The first is nuclear reprogramming. This comes from the initial frog cloning experiments. It refers to the morphological and molecular changes that occurs in the nuclei transplanted into the oocyte cytoplasm. These activated eggs prompts the transplanted nuclei to cease its RNA synthesis, and synthesize DNA. RNA synthesis will begin again in later embryonic stages when the embryonic nuclei from fertilized eggs begin to synthesize RNA. Incomplete or failure of nuclear reprogramming, in mammalian nuclear transplants causes arrested and/or abnormal development. There is also a benefit to mastering nuclear reprogramming. At some stage when the cell population is expanded, materials called inducers can be added to promote a desired cell differentiation like muscle, cartilage bone, etc. This differentiated tissue can be grafted onto diseased areas of the patient, without fear of rejection.

Cellular aging and genomic imprinting are the other two potential problem areas in the cloning process. Normal cells in the in vitro culture have a finite limit of replications. Depending on the creature being cloned these limits vary. Oocytes in amphibians have shown a tendency
toward one hundred or more cell replication cycles. Somatic nuclei seem to rejuvenate in oocytes because of the molecular substances found therein that support nuclear replication and mitosis. Telomeres, the DNA on the ends of chromosomes, may be shortened in animal clones, as they are as animals age. Genomic imprinting is a genetic mechanism that controls certain pairs of autosomal alleles’ differential expression. An embryo with double inactive genes, either paternal or maternal, fails to transcribe a necessary genetic product. This can lead to heritable human disorders like Angelman and Prader Willi syndromes, both the result of deletions in different homologues of chromosomes.392

5.4.2 Transgenic Experimentation and Development

McKinnell and Di Baradino say that cloning was begun so as to gain fundamental knowledge about cell processes and genetics. Knowledge is amoral; the choice of how to use it rests in the ethical decision-making of humans.393 Transgenic experimentation poses a challenge to the currently constructed ethical paradigm. Transgenic refers to combining human and non-human, in this case, cellular/genetic material. Thus far the experimentation has focused on therapeutics. This began in 1982 with the production of human growth hormone in transgenic mice. Human therapeutic proteins was produced in the blood, serum, milk, semen, urine of rabbits, mice, pigs, sheep and goats. Transgenic chickens now can synthesize human proteins in their egg whites. Organ donor pigs with human genes which can pass on their human genes to subsequent generations, as well as mice with human immune cells have been produced.394

In 2007 the UK House of Commons Science and Technology Committee published its report “Government Proposals for the Regulation of Hybrid and Chimera Embryos”. In this report the committee endorsed the creation of interspecies cytoplasmic hybrids (ICH). Using the eggs of animals devoid of their chromosomes to receive human somatic nuclei to produce human
embryonic stem cell lines, to overcome the shortage of human eggs for research is acceptable. They could produce substitutes for animal use in experiments. Drugs could be tested upon them. The reprogramming opportunities available through the use of these hybrids could prove invaluable to the research into tissue rejection.\textsuperscript{395}

The mixing of human and non-human gametes poses a particular problem. The closer species are to each other, the greater the chance of producing offspring. A male donkey mating with a female horse produces a mule. A male lion mating with a female tiger produces a liger. Both of these offspring are infertile.\textsuperscript{396} In 1928, Llya Ivanov, went to West Africa on orders from Russia’s government. While there he implanted human sperm into female chimpanzees. This experimentation was unsuccessful.\textsuperscript{397} If the chimpanzee is the closest primate to the homo sapien, did the experiment fail because the sample was too small, or because it was done willy-nilly, and not in a controlled environment, or were the instruments and techniques used too unsophisticated? Maybe bonobos would have been a better choice. These two primates are closely related to humans, with the bonobos being the closest. It would follow then that a way could be found to facilitate successful hybridization. The laboratory may prove a better breeding ground than nature. This mixing of gametes is already taking place in the UK, with the mixing of hamster eggs with human sperm. The purpose is to test the viability of the sperm. The hamster eggs are devoid of chromosomes. These hybrids are destroyed after two days. This is legal in the UK under the 2008 amended, UK Human Fertilisation and Embryology Act.\textsuperscript{398}

A major ethical hurdle to be jumped in the race to true hybridization rests in the conferring of moral status. Four theories try to define what bestows moral status on a being. These are the theory of cognitive properties, the moral agency theory, the theory of relationships and the sentience theory. Beauchamp and Childress analyze the technique of inserting human
neural stem cells into a fetal monkey’s brain to observe the action and location of the cells. The fetuses are not allowed to come to term yet, but that may happen. If one of these transgenic or chimeric beings is born, they may have behaviors and intelligence close to humans. If a more human brain is developing, is it ethical to just kill it? This creature could be capable of speech and moral behaviors. These human characteristics suggest that the chimera would fit into the traditional account of possessing moral status – human properties. A re-specification of what defines a person would be necessary.\textsuperscript{399} The theory of cognitive properties is used to confer moral status. Included in this is self-consciousness, freedom and capacity to act purposefully, capacity for beliefs, thoughts and desires, language capacity, and higher order volition and rationality.\textsuperscript{400} Could not the sort of hybrid we find here be capable of these things? The moral agency theory is next. Can the hybrid make moral judgments, and have his/her motives judged morally?\textsuperscript{401} The theory of relationships comes up. Both humans and other primates live in communities and have relationships with others in their species.\textsuperscript{402} Finally, the sentience theory of moral status comes into play, i.e. consciousness as feeling: the capacity for pain and pleasure and suffering confers moral status.\textsuperscript{403} Both humans and other primates have exhibited these attributes. Humans have moral status. Increasingly primates are seen as having moral status. It should follow therefore, that a hybrid/chimera sharing cells of both has moral status.

5.5 Human Directed Human Evolution: Transhumanism

Glenn McGee makes a simple, but emphatic statement in his essay “Cloning, Sex, and New Kinds of Families”. He states, “New technologies necessitate new stories”.\textsuperscript{404} His argument is that because of the advances in reproductive technology, there are new ways to have children. Children conceived and born via these technologies will, in essence, be different, and their difference will require that they be given and that they independently develop their own unique
stories. These new children, with their new stories have the potential to usher in another human age, one that sees new kinds of people living and telling markedly novel stories.

5.5.1 An Overarching Scenario

Let’s take this designing of persons to its intriguing and fear-causing conclusion with a possible scenario: By the year 2035 all alternative forms of making babies is legal, and the laboratories that provide these services are doing bumper business. Cloning is no longer limited to the therapeutic variety, and over two thousand cloned children are now living among us. CRISPR-Cas9 and TALEN technology are being used not just to turn off undesirable genes, but information is being added, (all sort of information), that expresses itself in iridescence and unique skin colors, polyphonic tones in speaking voices, the ability to regrow severed limbs, etc. The way fat is stored, indeed the inability to store excess fat has been modified so that obesity is not possible. Bonobo and human gametes have been successfully combined and carried in human wombs, from which are born chimeras...true hybrids. The eye color spectrum is wider, and the sight is stronger, clearer and more accurate. Gametes are chosen from donors possessed of greater intelligence, and an expert program has been developed for postpartum enhancement of this intelligence starting thirty days after the child comes home. These children are also given constant access to psychological testing and counseling, as are their parents, so that any psycho-emotional problems can be anticipated and dealt with as soon as possible. These new kinds of families, extant because of new kinds of children, form a loose community, supporting and celebrating one another.
5.5.2 Transhumanism: Definition and Discussion

This development of a new cadre of humans, produced by various technological methods is the essence of transhumanism. Simply put transhumanism, often called human enhancement by philosophers like Julian Savulescu, Nick Bostrom, and others, like Michael Sanders who are less bound to religious or ideological dogma is the evolution of human beings that is affirmatively directed by human beings. Knoepfler defines transhumanism expressly as a movement employing technology as the catalyst to human beings, and - this is his word – transcending the physical and intellectual of current humanity, to become a new and better species. Max More in his essay “The Philosophy of Transhumanism”, gives a more thorough definition. Transhumanism is the intellectual and cultural movement that advocates not only the possibility but also that it is desirable to improve humanity’s condition through the application of reason, in particular through the development of, and the wide dissemination of technologies that eliminate aging, and greatly enhance the physical, psychological and intellectual capacities of human beings.

The point of transhumanism is to move from DNA to h+, or from current humanity to something far better. Knoepfler makes the point that to reach what he calls homo evolutis the transformation must be hardwired into future human beings. They must be coded differently, hence DNA may need to go from ACGT, (the four bases that make up the nucleotide along with deoxyribose, phosphate and hydrogen), to whatever is necessary to make up h+. As far as the attendant need to bring the public along, proponents need to explain just what h+ is. The technologies discussed in this chapter present a means for effecting this recoding. An understanding of the technologies, the current place along the path of evolution in which homo
sapiens are currently located, and a means is drawing a clear, interesting and inspiring picture of where we could go is necessary to give real meaning to h+.

The expression of genes is not always predictable when there is no technological intervention. Do we know what artificially introduced genetic material will do? Can we know? The accurate answer is no . . . maybe. Knoepfler uses the example of a person who has been intellectually enhanced. He notes that intelligence can correlate with mental illness. This enhanced person could be schizophrenic. They could be immune, so to speak, from autism and/or Alzheimer’s disease, but they could also be given to cruelty. The point is that the transcendence transhumanists seek can have not only benefits; it can also have risks. Another consideration is that desirable traits may not be monogenic, but, rather, polygenic. Multiple cuts may have to be made to the gene to silence an undesirable and/or disease trait, and multiple additions may be called for to encode what the parents are looking for. The more that is added or subtracted, the greater the risks that can occur.

5.5.3 Is China Moving Forward?

In 2013 the Chinese company BGI Cognitive Genomics Group was cited in a Vice internet article, as attempting to engineer genius babies. They were collecting and analyzing DNA samples from people who were known to be among the most intelligent people in the world. They were trying to find gene variants affirmatively associated with high intelligence. The company was also looking for other desirable traits. The scientists involved were seeking to allow parents to have the “best kids they possibly could have”. In this case” best” referred to IQ. In the film DNA Dreams, by Bregtje van der Haak, the Michigan State University theoretical physicist Stephen Hsu talked about BGI and human enhancement in general. He begins his remarks by saying, “The best humans have not been produced yet”. He goes on to point out that
the longest lived, the smartest, etc. also haven’t come into production. Smartness, honorableness,
caring, niceness and other traits are related to certain genes, whether they are present or not. He
said that if we want finer control over the sort of people the future produces then we need to
learn to control the switches that control the production of these people. He went on to point out
that we do it with livestock, and have thus produced what we consider better livestock for what
we want. We, humans, have not pushed ourselves, Hsu felt.\textsuperscript{413}

At the end of the film one of the BGI scientists acknowledged the complexity of trying to
manipulate the genome to do what one wants. This goes back to the point made earlier in this
chapter about the unpredictability of genetic manipulation. However, he did conclude that people
should be at liberty to determine their children’s IQ; it should be their choice.\textsuperscript{414} In China there is
something that should be noted; the bioethics in that country is distinct from that in the West.
Deng Rui of Shanxi Medical University makes that point referring to Confucius. In the
Confucian ethical construct a person exists only after birth. In essentially Christian countries,
like the United States, experimenting on embryos may be objectionable. Rao Yi of Peking
University, goes further in saying, concerning gene editing that the Chinese will go ahead, and
see what develops from it, and then correct it. A final point from Yi was that Chinese geneticists
would not be guided by westerners.\textsuperscript{415}

\textbf{Conclusion}

Nick Bostrom, Director of the Future of Humanity Institute, at Oxford University wrote
an essay entitled “Why I Want to be a Posthuman When I Grow Up”. In it Bostrom talks about
the advantages he sees to humankind using the advances in science and technology to obtain
maximum expression in healthspan, cognition and emotion. He posits two theses: that some
posthuman modes of living would be quite good, and that becoming posthuman could be very
good for humankind. Modern reproductive technologies have opened the way to pre-partem medical intervention. They have also made it possible to shut off undesirable traits in embryos, and add positive information to the genome. It could even allow DNA from other species to be added to an embryos DNA. The question of SHOULD humankind take advantage of these technologies have now animated the debate about our future. This chapter treated the advances in reproductive technology that might allow both Bostrom individually, and humankind in general to become posthuman.
AN ETHICAL ANALYSIS OF BENEFICENCE AND NON-MALEFICENCE TO GUIDE EMERGING MEDICAL TECHNOLOGY

Introduction

Beneficence and nonmaleficence are two of the primary tenets of the bioethical theory principlism. It could be said that they are among the underpinnings of any bioethical regime. Simply put they derive from the concept of common morality, that one should not kill or harm anyone, or deprive anyone of their freedom or desires without an overriding, justifiable reason. There are other parts to this theory but for the purposes of this chapter the above will be sufficient. In this principle Beauchamp and Childress expanded the basic concept that is widely attributed to the Hippocratic ethic “first of all, do no harm”. This is not exactly what the oath says. The original Hippocratic Oath has medical practitioners pledge the use of dietary regimens to benefit patients, and to do no harm or injustice to them.417

In 1979 the landmark Belmont Report was published in the Federal Register. In that report only three principles were enumerated: respect for persons, beneficence and justice.418 Beauchamp and Childress in their seminal paradigm break the second Belmont tenet into two faces beneficence and nonmaleficence. This chapter will only briefly touch on respect for autonomy and justice, rather it will explore, in depth, beneficence and nonmaleficence, giving a general definition of both principles. These principles bleed into the principle of justice when they are applied to the macro concerns presented by the newest medical technologies such as immunotherapy and genomic-based medicine. It will show how they are to be employed at both the individual and macro levels. From there the wider application of these principles as put forth in Article 4 of the UNECSO Universal Declaration on Bioethics and Human Rights, will be explicated.
Only after this groundwork has been laid will this chapter move to an explanation of immunotherapy, genomic-based medicine and genomic/technological driven reproduction, and the application of beneficence and nonmaleficence to these medical technologies. Since, the greatest controversy is in the area of reproduction this chapter will treat the subject, for the most part, from the standpoint of reproductive technologies. Three non-Western bioethical principles will be employed to demonstrate how non-maleficence/beneficence can be used in the widest manner. The Buddhist and Hindu concept of Ahimsa, the concept of Ren from the Confucian tradition, and the African concept called Ubuntu, all from communitarian societies will be interrogated in relation to assessing the value of the unborn, ethics to reproductive technology, and reproductive technology as a community benefit. The effort here is to show that these diverse bioethical principles, though foreign to Western thought, contribute to the universality of beneficence/nonmaleficence. Finally, because of their salience in micro-cellular engineering, synthetic technologies as a whole will be assessed as a net positive for both the individual and the greater society.

6.1 Nonmaleficence and Beneficence: Principlism Concepts, the UNESCO UNBHR

In the United States of America bioethics cannot be discussed without reference to Tom Beauchamp and James Childress’s principlism paradigm. Its first principle respect for autonomy can be said to grow out of the overriding national value of individualism. In it the wishes of the patient must be respected and followed. In the event that patients lack decision-making capacity effort must be made to ascertain their desires and follow them.419 The principle of justice in healthcare, using the bullet points of justice as a material principle, can be summed up as the equitable regard for the rights and autonomy of patients, and the equitable treatment of patients, i.e. patients will receive the necessary therapies to manage and/or cure their maladies, usually
regardless of social characteristics. Beneficence and non-maleficence concern what clinical practitioners should do to ethically deliver healthcare to their patients, whether in hospital or scientific research.

6.1.1 Nonmaleficence

It can be said that the principle of nonmaleficence is the simplest of all. Do not harm the patient. That is the full focus. Being harmed can involve everything from suffering the effects of natural disasters, bad acts from other people, bad luck and most relevant to this chapter, disease. Harm, specifically construed by Beauchamp and Childress, is the setting back, defeating and/or thwarting of a person’s or persons’ interest. Far broader definitions of harm include setbacks to privacy, property, liberty, comfort, or reputation, offense, annoyance, and humiliation. The far narrower definition posits that harm refers to the infringement upon one’s psychological and/or physical well-being, i.e. health and indeed survival. More specificity can be enumerated thus: Do not deprive others of life’s benefits, nor cause offense, nor incapacitate, nor cause pain or suffering, nor kill. (All of these are informed by both the principles of justice and respect for autonomy.)

It is from here that the authors move the concepts of due care and negligence. Both concepts result from the above definition of harm, and also from the obligation not to impose risks of harm. Due Care is defined as appropriately acting to avoid causing harm, as a reasonable and prudent person. This requires a standard that the goals pursued justify the risks imposed in pursuit of those goals. Minimal risks would require minimal justification, while grave risks would require substantial justification. An example of the risk and justification ratio would be, in a situation where there has been a natural disaster, in a municipality where there is no trauma center, and only limited transportation to a center two hundred miles away, triage
would be performed by clinical staff. Those patients with the gravest injuries requiring especially complicated care, would result in minimal stabilization for them while they await transportation to a medical institution that can handle grave injury. These patients present the greatest risk of death because they have the most serious injuries and the staff and hospital are not equipped to care for such patients. The assessment made by the staff of merely stabilizing these patients is justified because too much that is necessary for proper treatment is missing. More thorough active treatment will be given to patients with injuries that can be managed by the available hospital. The staff at this initial hospital has little risk of losing these patients because their hospital is equipped to handle the kinds of injuries the patients have where they are. Thus the clinical staff can easily justify their decision.

Negligence occurs when due care is not taken. It can be intentional in that it can be reckless because unreasonable risks of harm were caused on purpose, or it can be unintentional because carelessly risks of harm are imposed. An example of intentional negligence would be when a nurse decides not to check a patient’s breathing tube overnight so that she can watch a program at her station. She decides that nothing will happen. The tube comes loose and the patient suffocates. Unintentional negligence is illustrated in a situation where a nurse does not read a child’s chart, and as part of the Halloween celebration he gives the child chocolate. The child is allergic to chocolate, and has an adverse reaction. Beauchamp and Childress also lay out a checklist for assessing failure of due care. (1). Clinical staff must have a duty to the patient. (2). The staff must breach that duty. (3). The patient must be harmed. (4). The harm must be caused by the nonfulfillment of that duty.
6.1.2 Beneficence

When they tackle beneficence, the authors make the point that it demands more than non-maleficence because it requires that clinical staff affirmatively attempt to help patients. They insist that morality requires that humans must contribute to the welfare of our fellow humans.\textsuperscript{431} They also put forth two concepts under the roof of beneficence, positive beneficence (requiring clinical staff to provide benefits to their patients), and utility (requiring the weighing of risks, costs and benefits to produce the best outcomes).\textsuperscript{432} As is the case with non-maleficence there are rules that give more specificity. Positive beneficence demands protection and defense of the rights of patients, prevention of harm to patients, removal of the conditions that cause harm to patients, helping disabled persons, and the rescue of persons in danger.\textsuperscript{433} The bioethical declaration by UNESCO attempts to apply this principle globally.

6.1.3 Benefit and Harm: Article 4, UNESCO’s UDBHR

This article like every article in UNESCO’s declaration grows from ground laid by the 1948 Universal Declaration of Human Rights. In both documents the dignity and equality of all persons are of paramount importance. The October 2003 mandate from the 32\textsuperscript{nd} session of the General Conference declared that these rights should evolve into standards specific to the realm of bioethics. Like all the UNESCO articles in upcoming chapters of this dissertation human dignity is at the center.\textsuperscript{434} The UNESCO Universal Declaration on Bioethics and Human Rights, in Article 4: Benefit and Harm, states “In applying and advancing scientific knowledge, medical practice and associated technologies, direct and indirect benefits to patients, research participants and other affected individuals should be maximized and any possible harm to such individuals should be minimized”.\textsuperscript{435} It must be noted here that this article assumes the inherent dignity of humankind, both as a whole and individually.\textsuperscript{436} It assumes that this dignity is possessed in equal
share by all human beings. No sociological (religion, political persuasion, income level, etc.), or physical characteristic (skin color, size, gender, etc.) either increases or decreases the amount of dignity a person possesses. It can also be said that the employment of the principles of beneficence/non-maleficence grow out of respect for that inherent dignity.\(^{437}\) This dignity, according to the authors of the UNESCO Declaration, carries with it the responsibility of humankind to respect other fauna, and the entire biosphere.\(^ {438}\)

When a patient presents in hospital, in a clinic or a doctor’s office they enter into a contract that the clinical staff, i.e. nurses, physician’s assistants, doctors, etc., will act in a manner that respects them, and is specifically geared toward, repairing, ameliorating, or curing the ailment/s with which they presented themselves. The visit is for the good of the patient.\(^ {439}\) It is the ethical duty of the clinical staff to work toward this good, and to do good to the patient. It is not enough to just avoid doing anything harmful. There must be an affirmative effort to do what is good for, and in the best interest of that patient.\(^ {440}\)

The UNESCO Declaration then takes up the concept of harm, positing that humankind has an “inviolable” claim to be free of having intentional harm visited upon them. The authors see it as a moral claim. The distinction here is that the claim is valid as it pertains to intentional harm.\(^ {441}\) The necessary treatment for an illness, or the experimentation necessary to arrive at a treatment may involve pain for the patient or subject. In the field of medicine, and in scientific experimentation there cannot be an absolute guarantee that no pain will be involved. Wise judgment and technical prowess are the tools to be used to adhere to the moral obligation as it concerns the prevention and/or amelioration of pain.\(^ {442}\) The idea is to weigh benefits, risks and harms before engaging in the treatment of, or experimentation upon the patient/subject.

Condensing Beauchamp and Childress’ “Nature of Costs, Risks and Benefits”, the Declaration

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counts harms as singly and in combination, whether spiritual, physical, financial, and/or emotional. Risks estimate both the possibility and probability of injury to the patient or society as a whole. Finally, benefits include developing a policy that works for the common good, gaining knowledge that will benefit future patients, advancing the interests of the individual patient and/or society. It is exactly the possibility of benefit and/or harm to the wider society that motivates this explication/interrogation. Immuno-medicine, genomic-based therapies and genetic manipulation methods for human reproduction are the new technologies that are rapidly enhancing medicine, and making it a subject of ethical controversy. The question is how will it be possible to show that they can fulfill the requirements of beneficence and non-maleficence, so that they will be able to be used to their fullest potential.

6.2 Immunological Medicine, Genomic-Based Medicine and Reproductive Technology an Overview with Examples

The new world is here in the field of medicine. The human immune system can be suppressed or stimulated so that it can be used in the treatment of disease. Genomic-based medicine employs human genetic code to do the same sort of thing. A specialized application of this pertains to reproduction. Traits can now be subtracted and/or added to the genome of children yet to be born. All three of these innovations will be examined here defining and citing examples of each.

6.2.1 Immunological Medicine

Immunological Medicine can be boiled down to the field of immunotherapy. Immunotherapy involves the use of natural and/or synthetic agents to either stimulate or suppress the immune response, to check the growth of malignancies, and to treat immune-deficits.
this general focus it is necessary to get much more specific. The idea is not only to fight disease but, as is the case with the two other medical innovations, to facilitate the continuing health of the individual throughout their lives. Ying, et al call this precision immunomedicine (PIM), the individual variability of each patient, mobilizing the total immune system of components thereof in the fight against disease, e.g. immune cell therapy, vaccines, immune system modulators and therapeutic antibodies. Ying is expanding the term precision from the area of cancer research. The next concept may seem contradictory, but PIM does not signify the development of unique therapies for each individual, but rather concentrating on the approaches that are most effective for patients based on immune-related factors. PIM may allow the technique to spread beyond cancer to infectious diseases, and may help improve the cost-effectiveness, safety and efficacy of immunotherapy.

Personalis, an immunomedical firm, has been working in the field of immune-oncology (immunotherapy applied to cancer prevention and treatment). They have developed a product called ACEimmunoID, and they describe it as an “immunogenetic platform”. This immunogenetic platform allows scientists/technologist to bypass inhibitors to research in this area. Among these inhibitors are the (a) discovery of neoantigens, biomarkers and genomic signatures, (b) determining a rational design personal cancer vaccine, (c) understanding the potential mechanisms by which tumors escape, and (d) clarifying the tumor’s microenvironment. ACEimmunoID is a “platform” upon which researchers can base their research into immune-oncology.

America’s Biopharmaceutical Companies, in partnership with the Cancer Action Network of the American Cancer Society, in 2017 published its Medicines in Development Report. Of the 1.6 million cases of cancer estimated to be diagnosed in 2017, approximately six
hundred thousand fatalities will be expected to result.\textsuperscript{449} To combat this the report states that there are 248 immuno-oncology therapies and vaccines currently in development by biopharmaceutical companies. They are all awaiting review by the Food and Drug Administration (FDA). Examples of these are adoptive cell therapies (Cart-T Therapy) in this report, cytokines, immune checkpoint modulators, vaccines, bi-specific antibodies, and oncolytic virus therapies.\textsuperscript{450}

CART-T Therapy is an example of adoptive cell therapy. In Cart-T Therapy a patient’s T cells are altered to produce a wave that attacks cancer cells. In this process, the T cells are removed from the patient, modified with a cancer fighting gene and reinserted intravenously. They go on to destroy the cancer cells. As of 2017 at least six hundred and fifty CAR-T therapies are in development.\textsuperscript{451}

Some tumors require other approaches; immune checkpoint modulators are among those being developed. Tumors can contain specific proteins, identified as checkpoints, that suppress the immune response. Modulators would release these brakes, like CTLA-4, PD1/PD-L1, and OX40, enabling the immune system to fight the cancer. At the time of this dissertation forty-five of these checkpoint modulators are in development.\textsuperscript{452} Oncolytic virus therapy is used in melanomas when surgery has been unsuccessful, or when the legion cannot be surgically removed. In this process, a genetically modified virus is inserted directly into the legion, replicates and causes the legion’s cells to rupture. Currently fourteen such therapies are in development.\textsuperscript{453} As is the case with other diseases vaccines can prevent the advent of disease in the individual. This is the case when it comes to the human pampillomavirus. In prostate cancer, the vaccine currently being developed is therapeutic, geared to causing the immune system to be
a much stronger and more efficient warrior. Ninety-six vaccines are in the development pipeline.\textsuperscript{454}

Checkpoint modulators have been the therapies that have been the most promising so far. Taking the example of people treated with the Bristol-Myers Squibb Company’s drug Yervoy, where of 4,846 with advanced melanoma that were given the drug, more than a thousand (21%) survived for three years, and their long-term survival prospects are very good.\textsuperscript{455} Most patients (79%) do not respond as well as these “super-suitors”. That, the fact that not quite a fourth of patients gain remission through this treatment is a major obstacle to the wider spread of the use of checkpoint modulators.\textsuperscript{456} Another important obstacle is a fee for service medical system, like that of the United States. The cost of Yervoy by Bristol-Meyers Squibb is $120,000 for a four-course regime, and Keytruda by Merck costs $150,000 per year, or $12,500 per month, prime examples of the fee for service model of health care delivery.\textsuperscript{457} Melanoma has been the most successful use of these therapies, but to validate their use the therapies must prove effective for other cancers. As of 2014, data presented at the American Society of Clinical Oncology, and the European Society of Medical Oncology showed positive results for checkpoint modulator therapy in treatment of head and neck, bladder, kidney and other cancers. Hodgkin lymphoma, pancreatic, breast and other cancers are being tested now.\textsuperscript{458}

6.2.2 Genomics-Based Medicine

Genetics is the study of single genes and their effects, whereas genomics is the study of the interactions and specific functions of all the genes in the genome.\textsuperscript{459} It is predicated on the experimental access to the entire genome, and is applied to conditions that are considered common, e.g. colorectal cancer, HIV, breast cancer, Alzheimer’s disease, tuberculosis and Parkinson’s disease. These are multifactorial disorders, because they are the result of multiple
genes and environmental factors. Genetic variations in these disorders may have a pathological or protective role in the expression of diseases. The decreasing effect of some environmental factors, such as infectious agents, on disease highlights the role of genomics in healthcare.\textsuperscript{460}

Genomic medicine, according to Harold Varmus, aims to predict the healthy person’s risks of disease, even common disease. It tries to analyze the patterns of a gene’s expression as a supplement to conventional diagnostic methods. Finally, genomic medicine seeks to evaluate multigenic diseases and responses to environmental agents and drugs.\textsuperscript{461} Guttmacher and Collins use the following cases to illustrate the two common ways genomic medicine is practiced.

“Thirty-four-year-old Kathleen becomes pregnant and sees a new physician for her first prenatal visit. Her medical history is remarkable for an episode of deep venous thrombosis five years earlier while she was taking oral contraceptives; her mother had had deep venous thrombosis when pregnant with Kathleen. Her physician suspects that Kathleen has a hereditary thrombophilia and obtains blood tests to screen for a genetic predisposition to thrombosis. Kathleen proves to be among the approximately 4 percent of Americans who are heterozygous for a mutation in factor V known as factor V Leiden that increases the risk of thrombotic events. On the basis of this knowledge and her history of possibly estrogen-related thromboembolism, she is treated with prophylactic subcutaneous heparin for the balance of her pregnancy. She remains asymptomatic and delivers a healthy, term infant.”\textsuperscript{462}

“Four-year-old John has acute lymphoblastic leukemia and tolerates induction and consolidation chemotherapy well, with minimal side effects. As a key part of his maintenance-treatment protocol, he begins to receive oral mercaptopurine daily, but because a genetic test shows that John is homozygous for a mutation in the gene that encodes thiopurine S-methyltransferase, an enzyme that inactivates mercaptopurine, he receives a greatly reduced
dose. Only a few years ago, about 1 in 300 patients had serious, sometimes lethal, hematopoietic adverse effects during mercaptopurine therapy. Although John is in this at-risk minority, a simple genetic test, which is now routine for patients beginning mercaptopurine therapy, alerts his physicians to this genetic predisposition. They reduce his dose of mercaptopurine and carefully monitor his blood levels, ensuring that the drug levels remain therapeutic, rather than toxic. John subsequently has an uneventful several-year maintenance period and achieves complete remission.”

In the first case the presentation of deep venous thrombosis (DVT) is diagnosed by taking into account Kathleen’s medical history as well as her mother’s history. A genetic test for predisposition to DVT verifies this diagnosis. The actual mutation is ascertained and prophylactic measures are taken to prevent the DVT’s occurrence. This can be seen as a textbook example of following the principle of beneficence. In the second case, John, a boy with lymphoblastic leukemia, who responds well to normal chemotherapy, is found through genetic testing to have a mutation that will prevent the effectiveness of mercaptopurine therapy. The test that found this out is now routine, which prevents the severe or lethal side effects of mercaptopurine therapy experienced in the past. Thus, John’s dosage is reduced. Blood tests allow him to be monitored so that the therapeutic effect of the treatment remains consistent, and he enters remission after a few years. Again, a textbook example of beneficence, medical science was employed to accurately diagnose, so as to be able to mitigate current harm, and prevent future harm.

6.2.3 Reproductive Technology

Three main technologies have shown promise in the area of reproduction. They are preimplantation genetic diagnosis (PGD), mitochondrial DNA therapies (mtDNA), and CRISPR
Cas-9. All of these techniques face close scrutiny, not just scientifically, but also because of the ethical considerations they make necessary. Preimplantation genetic diagnosis (PGD) is possible because of a particular human embryological idiosyncrasy. In the in vitro fertilization (IVF) process the embryo is grown in a nutrient rich solution, inside an incubator, growing into a blastocyst. Eight to sixteen cells form, usually after three days. If, at this stage, a few cells are removed the remaining cells will divide and fill the space those removed cells left. The embryo will continue to mature undeterred. It is at this stage that the embryo can be biopsied and tested for defects. Those embryos that are free of defects and most likely to have the desired attributes can be implanted in the natural mother’s or donor womb. This process can be modified so that a woman’s oocytes could be genetically tested before they are fertilized. From a moral standpoint if desired embryos are selected for implantation, and the others are cryopreserved, whether for a different purpose or not, then ethical concerns can be allayed. The trouble comes when the other purposes are determined. The embryos may not have been aborted in the initial rounds, but they could later be used for experimentation, or destroyed.

Mitochondrial DNA (mtDNA) is present in and unique to the mitochondria. It has been used in experiments by Shoukhrat Mitalipov on non-human primates to ascertain if it had any therapeutic use, but was banned for human experimentation in the United States. Because of this Dr. Mitalipov had to team up with Chinese and South Korean laboratories to do further research. mtDNA research has been controversial because it involves what is known as three-parent embryos. The process involves removing the nuclei from an ovum of one woman, placing it into a donor ovum, to be fertilized with spermatozoa. Ultimately, a child could be born from these three “parents”. Any progeny from this blending would possess DNA from all the parents. The function of this mitochondrial replacement technique (MRT) is to prevent the
transfer of mitochondrial genetic defects like Tay-Sachs, and sickle cell anemia to future progeny, usually when both parents have the necessary undesirable traits.\textsuperscript{468} Traits like those named above, as well as Kearns-Sayre Syndrome and Leber’s hereditary optic neuropathy tend to be the result of deletions.\textsuperscript{469}

Gene editing, the subtracting and/or adding of a gene/s to the genome of the blastocyst, has caused the loudest uproar. Even more than is the case with PGD, with these techniques parents could in fact design their offspring. CRISPR/Cas9 is the most famous technique in this field. CRISPR/Cas9 stands for clustered regularly interspaced short palindromic repeats, CRISPR-associated (Cas) protein 9 system. This technique allows tiny gene sequences to be targeted for modification. Once found then the bases: adenine, cytosine, guanine and thymine, can be erased or changed, not only in one sequence, but in much larger regions.\textsuperscript{470} With this technique a nonspecific Cas9 nuclease (facilitating hydrolysis) and a set of programmable sequence-specific CRISPR RNA (crRNA), guides Cas9 to cleave DNA and generate double-strand breaks at target sites, while a subsequent cellular DNA repair process leads to desired insertions, deletions or substitutions at target sites.\textsuperscript{471} Zhang, Wen and Guo make this even clearer, in their paper explaining not only what the CRISPR/Cas9 technique is, but also what its challenges are and what it could mean. They write that the technique could certainly correct genetic defects vis a vis disease, and that it will elucidate the full function of specific genes.\textsuperscript{472}

The possibility of germline modification is the issue that most critics of these developments point to when enumerating their objections. Allen Buchanan tackles this issue, under the summation of this area of new technology as intentional genetic modification (IGM). He gives three reasons for the strong aversion to these technologies. The first is that people see these specific kinds of modification will have greater kinds of negative unintended
consequences. The second reason is that these negative unintended consequences will be irreversible. The third reason is the “change in biology” argument; these changes will prove more dangerous to humankind. Buchanan suggests that in order to cope with these possible unintended consequences developing and utilizing a variety of cautionary heuristics that are responsive to changes in humankind’s knowledge about risk, and that encourages humankind to gain more knowledge relevant to assessing risk. He argues that merely prohibiting the employment of IGM would be doomed to failure, and that relying on an over-arching risk-reduction principle, like the Precautionary Principle may be better, it is not an optimal solution.

6.3 A Discussion of the Precautionary Principle

It might be more accurate to say that here I will discuss the principle of precaution. The principle of precaution hums just underneath Beauchamp and Childress’ nonmaleficence and beneficence principles. As was the case in the Belmont Report, in this section nonmaleficence and beneficence will be the two faces of the principle beneficence. Do not harm the patient. Mitigate and/or terminate any harm that is present. Prevent any harm that can be reasonably foreseen. It is the contention of this author that those three statements basically sum up this two-faced principle. This is what the public would see when presented with the concept of precaution.

Since these groundbreaking technologies are to be used, presumably, for all patients from here on out, it necessarily follows that a general policy within the medical professions, and within the practice of public health policy will develop to oversee them. The precautionary principle is regarded as originating in the Rio Declaration on the Environment and Development. People and governments tend to want to exercise caution in medical innovation.
his 1988 Wingspread Statement to limit the principle to threats to the environment and to humankind, stating that precautionary measures should be applied even if causal relationships were not entirely scientifically established.\textsuperscript{477} Earlier in The Transhumanist Reader he characterizes the principle as overly simple and biased, a rule for making decisions about technological and environmental issues in the advent of formidable risks.\textsuperscript{478} S. D. John writes that only a practical and justifiable approach should be taken in the use of the principle of precaution. Abstract concepts of good should not enter into play.\textsuperscript{479} Assessment of outcomes must be made based on three standards good, normal-bad and special-bad. Good outcomes work to the good of society either intentionally or unintentionally. All three of the above cited medical innovations have the good of society as their goal, and it can be said that their sought after outcomes are intrinsically good.

There are two bad outcomes, according to John. Normal-bad outcomes are those that are low level negative things that are likely to result from the action taken, or the application of the principle. Special-bad outcomes are those that are high level negatives resulting from a given action, again the application of the principle. Special-bad outcomes do not fit neatly in risk-cost-benefit assessment.\textsuperscript{480} Beauchamp and Childress situate precaution within this assessment, but they note that any and all risks cannot be known or planned-for. The assessment of possible outcomes and variables that cannot be controlled demand that precaution be a process.\textsuperscript{481} It must be justifiable using their principles of beneficence and nonmaleficence, characterized by public involvement and transparency, taking expert opinion regarding responses to threats unpredictability, ignorance of magnitude, and probabilities.\textsuperscript{482}

John makes clear that when it comes to policy special-bad outcomes, because they have the highest level of negativity, are to be assiduously avoided.\textsuperscript{483} The idea is to benefit the greatest
number of people possible, and give the greatest value. Sometimes caution causes entities to
avoid trying to achieve a good outcome because a special-bad outcome could also result. The
assessment of what the outcome might be can be rational in that science and mathematics are the
primary agents of the assessment. It is, however, usually the case duty, moral obligation and
deontological beliefs also have agency in the assessments.\textsuperscript{484} This process puts one in mind of
the principle of double effect because three of its tenets could apply here. The super-bad outcome
must not be intended. The super-bad outcome must not outweigh the good outcome. The
outcome achieved must not be morally wrong.\textsuperscript{485}

Nathan Dineen says that simple precaution is not principled, but it is pragmatic. The
precautionary principle works both to be principled and pragmatic, rooted in morality as well as
legality. Acting in the best interest of future generations and reinforcing human dignity are
included in adhering to this principle.\textsuperscript{486} Dineen argues that this is distinct from the precautionary
approach, which he sees as being in more common use in the United States. Here he argues that
unlike Beauchamp and Childress’ conclusion, the precautionary approach lends itself exactly to
discussions of cost-benefit analysis and risk management in more rational and economic
sense.\textsuperscript{487} Here, Dineen runs into Max More’s argument that precaution lends itself too easily to
non-rational decision-making. Because deontological beliefs often play a part in the
considerations of what constitutes harm, and in how harms are to be dealt with, they are not
objective, and thus the principle may indeed prove to be harmful in its overprotection of
humankind. It stifles risks and therefore stifles progress. It draws resources and consideration
from important issues and innovations.\textsuperscript{488} With this principle avoidance of harm trumps progress.
This is not the case in every situation. Modern medical ethics demands precaution. It demands
carefulness, and logical progress. Humans are not entirely rational, i.e. motivated solely by the
facts of the sciences, mathematical calculations and theorems, statistical studies and the documented facts of history, rather humans use these rational inputs with deontological beliefs and other psycho-emotional inputs. The next section will explore these non-rational inputs with reference to the new reproductive technologies, and ethical ideas from non-Western cultures.

6.4 Non-Western Ethical Concepts Related to Beneficence and Nonmaleficence

Beauchamp and Childress talk about the common morality, and among the norms or “rules of obligation” to be found therein they list: (a) rescuing those in danger, (b) preventing the occurrence of harm, (c) refraining from causing pain and suffering to others, and (d) refraining from killing. They maintain that this morality is the morality of those committed to being moral. It is to be concluded then that the common morality is applicable to everyone, everywhere, and not only that, the conduct of everyone rightly must be judged by this standard.

What follows is a look at three distinct non-Western strains of thought about what should inform what is ethical, or moral when it comes to the technologies used in genetic engineering, both organic and synthetic.

6.4.1 Ahimsa as applied to the unborn: assessing their value (Hindu/Buddhist)

Ahimsa is a concept that comes from the Indian subcontinent and is integral to both Hinduism and Buddhism. The principle of nonmaleficence, grows out of the common morality, specifically the rules cited above. In Buddhism there are three fundamental values or basic goods: life, knowledge and friendship. Within the good of life is the principle of non-injury or ahimsa. Because respect for life is so important this particular principle is the distinguishing feature of Dhamma, which is Pali for Dharma, the Buddhist natural law. Therefore, non-injury or
ahimsa, and the respect for life subsumed within it, is at the very heart of Buddhist teaching. This is a moral imperative and pervades all Buddhist precepts.\textsuperscript{492}

Crawford defines ahimsa in two ways: do no harm and nonviolence.\textsuperscript{493} He describes it as the “cardinal virtue” of Hinduism. The entirety of creation is worthy of ahimsa. In classical Hinduism ahimsa is the umbrella framework for the virtues classified under Yama or restraint. It includes not just nonviolence but also non-hatred or vairatyagah. Universal in its scope ahimsa cannot be made relativist with a plethora of conditionals and caveats.\textsuperscript{494}

In this section the concept of ahimsa will help to enlighten the reader to why the three most groundbreaking genetic engineering technologies do not necessarily violate the principle of nonmaleficence. PGD, mitochondrial DNA therapies (mtDNA) and CRISPR Cas9 represent the cutting edge of reproductive technology, and as such they are the subject of much controversy. This is particularly true of mitochondrial DNA therapies and CRISPR Cas9, because they both involve the human germline. (Germline refers to cells from which ova and sperm originate.)\textsuperscript{495} CRISPR Cas9 not only allows specific genes to be deleted from or added to a person’s genome but it allows the trait to be passed to the progeny of that person; mtDNA therapies allows healthy mitochondrial DNA from a donor to be substituted for unhealthy mtDNA in a woman’s ovum. The new trait would be passed to future progeny. PGD allows defects in blastocysts to be detected far earlier, and for the growth of other blastocysts and for the elimination of defective ones.

In all three technologies the aim is to allow healthy progeny to be born. Ahimsa is about the respect for life. Both Hinduism and Buddhism proclaim this to be fundamental, with the Jains carrying it somewhat further into inanimate objects and systems.\textsuperscript{496} However, the argument is made that in both mtDNA therapies and PGD blastocysts are discarded when they are deemed
defective or non-optimal. In the Hindu tradition, if one does not limit the interpretation of ahimsa, then one could see that even when blastocysts are destroyed, if their destruction is to benefit humankind then it is morally justified. This destruction is beneficent in that what is best for humankind is the guiding force behind it. I would argue that though the blastocysts were not allowed to become viable fetuses and grow into full term babies, the principle of ahimsa applies because defect free life is allowed to be born, and the greater community is not subject to care regimes for persons born with defects, or the emotional costs of a child that is dead or terminally sick at birth. The most viable life is allowed to grow to maturity. Simply stated, defective blastocysts even if they go to term, a sick baby will be produced, and thus the principle of ahimsa (nonmaleficence) would be breached. In Buddhism CRISPR Cas9 fairs best, because the therapy is performed on a blastocyst that is then implanted in the womb, it is therapy for the developing embryo and thus could be called beneficent. To take the argument further, since the First Noble Truth of Buddhism is that suffering is intrinsic to life, and the essential mission of medicine is the amelioration of suffering, then genetic reproductive medicine is a powerful tool for the elimination of suffering for the potential progeny, and for their families. Genetic science seeks to eliminate suffering, thus only an adharmic person, one not acting consistent with the Dharma, would forbid any and all of this reproductive endeavor.

These potential progeny, as is the case with ones who are naturally conceived, would have the intrinsic value of any who have life. In Buddhism that would be all who can potentially achieve nirvana. They can achieve liberation. There is the presence of karma in these potential lives; it can have a moral biography, and its value is intrinsic rather than instrumental. These progeny are sentient and individual, and have the potential of a spiritual telos. This is the kind of life, and the kind of living beings to whom ahimsa most applies.
6.4.2 The concept of Ren: Confucian Virtue Ethics Applied to Reproductive Technology

The concept of ren unlike ahimsa, which is fundamental to two religions, is unique to Confucianism. It is the term for the virtue of practicing humanity. Yu and Lei clarify the meaning of ren further writing that virtue (de) in ren can be accurately translated as benevolence, using the pre Legge translation of Confucius’ Analects. They also compare Aristotle and Confucian philosophy noting that both saw ethics and politics as inseparable. Confucius in his Analects states that governing is rectifying. They also shared the belief that virtue entailed moral wisdom, moral sentiments and social values. This author would argue that ren finds itself in accord with the notions of nonmaleficence and beneficence. Tsai enumerates some principles of ancient Chinese medical ethics (ACME). Some of them echo the Hippocratic ethic. Among these principles are: (a) Don’t kill any creature, save lives, (b) Examine and be careful in diagnosing, accurate in prescribing and effective in curing. Tsai also says that ACME had as one of its underlying principles mastering Confucianism prior to studying medicine, and mastering medical knowledge diligently and extensively studying legitimate sources. It is advisable to note here that Tsai uses the term jen instead of ren, they are the same in meaning, the old meaning of benevolence and humanness.

Due care, appropriately acting to avoid causing harm, as a reasonable and prudent person, is expressed in the admonitions not to kill, be careful in examination, diagnosis, prescribing and effective in curing, and seeking to master reliable medical information. Ren is found in the practice of medicine because it is the perfect virtue and the immanent character of humaneness that makes the practice of medicine respectable and valuable. This is the essence of nonmaleficence. Going back to the medical maxims of Kung Ting-Hsien to illustrate the principle of beneficence Tsai points out that because of ren ACME demanded that physicians
must have a disposition to humaneness, making all necessary effort to assist the people and to perform wide-ranging deeds.\textsuperscript{506}

He, Tsai, comes to the following conclusions. Shiaw, the cultural norm of filial piety, common good and family values causes most Chinese individuals to sublimate their autonomy to family decision-making and/or social values. Public interest often outweighs individual interests and rights. The individual has a responsibility to the larger group. Beneficence, nonmaleficence, and their natural outgrowth justice find themselves interpreted in a socially-oriented manner. This cultural norm, along with a certain amount of paternalism both in government and medical practice cause the Chinese to take a beneficence-oriented, rather than an autonomy-oriented approach to medical practice.\textsuperscript{507}

This lends itself to the justification of the new reproductive technologies. The justification is that they are examples of medical beneficence. China is already moving rapidly along the road opened by these technologies. The area they have been making progress in is trying to enhance IQ in children. In 2013 the Chinese company BGI Cognitive Genomics Group was cited in a Vice internet article, as attempting to engineer genius babies. They were collecting and analyzing DNA samples from people who were known to be among the most intelligent people in the world.\textsuperscript{508} They were trying to find gene variants affirmatively associated with high intelligence. The company was also looking for other desirable traits. The scientists involved were seeking to allow parents to have the “best kids they possibly could have”.\textsuperscript{509} In this case “best” referred to IQ. In the film DNA Dreams, by Bregtje van der Haak, the Michigan State University theoretical physicist Stephen Hsu talked about BGI and human enhancement in general. He begins his remarks by saying, “The best humans have not been produced yet”. He goes on to point out that the longest lived, the smartest, etc. also haven’t come into production.
Furthermore, Hsu said that we need to learn to control the switches that will allow us to control the production of the kind of persons we want. He went on to point out that we do it with livestock, and have thus produced better livestock for what we want. We, humans, need to push ourselves, Hsu felt. 510

At the end of the DNA Dreams one of the BGI scientists acknowledged the complexity of trying to manipulate the genome to do what one wants. This goes back to the point made earlier in this chapter about the unpredictability of genetic manipulation. However, he did conclude that people should be at liberty to determine the children’s IQ; it should be their choice. 511 In China the bioethics in that country is distinct from that in the West. Deng Rui of Shanxi Medical University, briefly clarifies the philosophy that undergirds Chinese bioethics regarding genomic research and experimentation. In the Confucian ethical construct a person exists only after birth. In essentially Christian countries, like the United States, experimenting on embryos may be objectionable. Rao Yi of Peking University, goes further in saying, concerning gene editing that the Chinese will go ahead, and see what develops from it, and then correct it. He also implied that certain discussions may be lost. Chinese geneticists will not be guided by westerners. 512

There is then a great question for the West. Isn’t it imperative that these technologies flourish in light of the principle of beneficence? Should not potential parents, and society as a whole have the benefit of these technologies? Beneficence does not confine itself to the individual physician/patient relationship. It is applicable to the relationship of medical science and the larger society. Ren has within it, when applied to the medical profession, the mandate that the clinical staff perform wide-ranging deeds, and make all necessary efforts to assist the people (the larger society). In being able to allow infertile couples to have babies, or being able to diagnose morbidities in un-implanted blastocysts, or being able to treat defects in fetuses, and
being able to enhance potential babies before implantation, it can be argued that wide-ranging deeds and fully assisting the people is being practiced.

6.4.3 Ubuntu: Reproductive technology as a benefit to the community

In the preface to his book placing African indigenous ethics in the global bioethical context, Leonard Chuwa explains Ubuntu as a worldview and way of life common to most sub-Saharan Africans. It is a term that sums up the role that relatedness and dependence of individuality upon other humans and the cosmos (his term) has. There are two maxims: (1) a human is a human because of other humans, and (2) a human is human because of other humans’ otherness. In the conclusion he writes that Ubuntu promotes life-centered ethics, protects the rights of the individual within a cosmic context so as to enhance solidarity, and illustrates a communal worldview in which individuals, community and the world are connected for ethical decision-making. 513

The new reproductive technologies, both collectively and singly, can be said to fit perfectly into this inclusivist mindset. “I am because we are”, says what the commonly held societal philosophy is.514 We takes precedence over me (which prevails in the West), and I would argue that these technologies are less abstract in this context. How can the fact that there are in essence three parents of the progeny conceived by way of mtDNA therapy not be the embodiment of Ubuntu? On a continent where rates of infant mortality, and birth defects are high PGD can be a force for significant reduction in those rates. CRISPR/Cas9 can take this even further and allow Africans to both control defects and add enhancements to their progeny. In all these ways the collective is benefitted. Healthy children usually grow into healthy adults, and such adults tend to be more productive than those who are not. Used properly these advances can benefit more than just the highest socio-economic level of society.515
Like ahimsa and ren, Ubuntu is an overarching personifier of nonmaleficence and beneficence. Two of the rules of beneficence listed by Beauchamp and Childress are: prevent harm to others, and remove conditions that will cause others harm. The authors cite one rule for nonmaleficence, the prohibition against one inflicting evil or harm to others. Practicing the genome-based reproductive technologies obey the rule calling for the removal of conditions that will cause others harm. Chuwa makes the point that in most African traditional societies not having children is akin to death, because no one is left behind to sustain your immortality. Men and women who produce children are essential for the survival of the community. The blastocyst, because procreation is seen as both physical and spiritual, would fall into the category Safro Kwame would call the quasi-physical (an object belonging to the place between the obviously physical, i.e. obeying the laws of physics, and the spiritual, i.e. not obeying those laws). Finding and removing morbidities, or enhancing them so that these blastocysts can grow to become full members of the communal we, is exactly the point of these therapies. Ubuntu bioethics requires that the community takes care of spiritual responsibilities and the care of the sick and disabled, so the therapies fall in line by addressing these quasi-physical beings. It is a fact that Ubuntu is anthropocentric, in that everything is centered on human life. Chuwa writes that everyone is required to take responsibility to nurture human life before birth and even after death.

Ubuntu, in the Zulu phrase umuntu ngumuntu ngabantu, i.e. "a person is a person through other persons”, describes a worldview and way of life that is beneficence and nonmaleficence at its very core. The argument of Beauchamp and Childress is that the four tenets of principlism do indeed translate into other cultures and countries, and are therefore international. The bone of contention is about autonomy and its definition in Africa and in Islamic nations, and its
appropriateness in the medical cultures in these places. Beneficence and nonmaleficence are not challenged. Ahimsa, ren and Ubuntu are these principles at work in Asia, and in Africa. They are not envisioned exactly the way they are the principlism paradigm, but they are cut from the same cloth.

Genomic-based medicine, immunotherapeutic medicine, and the new reproductive technologies are unsettling to some, and immoral to others, and as such their benefits for the larger society tend to be obfuscated. When discussing them as issues it is necessary to ramp the principles being considered in this treatise up higher than the level of patient/physician interaction, to the level of the common good. In the culture of Ubuntu the common good is the proper balance of individual and community interests. Every action has consequences, therefore the actions are considered social actions. Beneficence would require, in the culture of Ubuntu, doing the right thing, not because of compulsion, but because it is the right thing for the individual and the community. One realizes that one is a part of the current and previous generations, and therefore anything that subverts the common good is unethical. This is because personhood is facilitated by, and dependent upon the human community.

It is important to note here that Ubuntu culture does not prohibit the consideration of an individual’s autonomy. A person’s OTHERNESS (unique rights and privileges), within the bounds of community/the common good is respected. It follows that a couple can decide to use any of these reproductive therapies if they decide to do so, because procreating is considered necessary for the good of the community. Ubuntu’s stress on the common good, and doing what is best for community as a whole, as well as the individual could open the door in Africa for the new development of synthetic biology.
Synthetic biology has become an integral part of genomic science. It is a sort of genetic engineering that is different from technologies like CRISPR/Cas9 and TALEN. Researchers and engineers in this field seek to design and construct biological parts, organisms and systems, and to redesign currently existing biological systems for useful purposes. According to Kaebnick and Murray synthetic bio-engineers are interested in designing new life and constructing it from the ground up. 525

There are three courses that synthetic biology is embarking upon. The first course is called synthetic genomics. Synthetic genomics involves stripping the genome of unnecessary genes, scaling down to only the life sustaining genetic material. Researchers are trying to make the resulting “minimal genome” become a useable platform for augmented specialized genetic material so as to make the genome programmable. 526 “Biobricks” or bioparts is what the second course is called. Standard, interchangeable genetic sequences (the bricks) would be developed, and inventoried and coded so that when inserted into cells would predictably cause the cells to function in expected ways. Each sequence would be coded for a limited function, and multiple sequences would be joined, and when added to cells, cause the cell to behave in desired ways. Different configurations of the bricks would result in different behaviors. 527 The third course, called protocell development also creates a platform, but unlike synthetic genomics the whole cell can come into play, rather than just the genome. Protocell development may use cellular materials and mechanisms that are different from those in existing organisms. This is seen as the ultimate goal, creating a new living entity sans DNA, nucleus, mitochondria, conventional biomolecules, endoplasmic reticulum, conventional cell membrane, or any other of the vital ingredients of normal biological cells. 528
New organisms can be created by means of synthetic biology. These new organisms may just be the agent that leads to breakthroughs in the treatment and/or curing of various illnesses and diseases. Thus, they have the potential to be of benefit to individual patients, and society as a whole. Ubuntu has as a virtue using those things that can benefit the community. Doing what is necessary to relieve suffering is beneficence. Synthetic biology has the potential for the construction of a living agent that could cure cancer, reverse the adverse effects of aging, and/or cure A.I.D.S. As long as precautions are taken to mitigate or reverse any negative effects from the organisms, nonmaleficence is being followed. Allowing whatever benefits these organisms can bring to patients and the wider community to flourish falls in line with at least three of Beauchamp and Childress’ rules of beneficence.

**Conclusion**

Though synthetic biological research and technology, immuno-medicine, genomic-based medicine, and the new reproductive technologies herald a bold new medical world, many people in all walks of life fear them for what they are, and for what they can be. This fear is particularly acute when these innovations involve the potentiality of or express crossing of the germline.

The principles that Beauchamp and Childress call beneficence and nonmaleficence, expanded from the Belmont Report’s singular principle of beneficence, and various tenets of the Hippocratic Oath, can be applied in a micro sense, the way the individual patient is to be treated by clinical staff so that they will not be intentionally, or unnecessarily harmed. The staff will also act to protect them from risks, and act in their best interest, and do all to lead to the best possible outcome for them. In the macro application of these principles first it can be said that they are indeed global. Along with the principle of justice (though the definition of justice may vary in emphasis depending on the cultural definition of it), they were not the subject of argumentation.
in the Kelly Lecture like the principle of respect for autonomy. Beneficence and nonmaleficence are both individualistic and communitarian.

To illustrate this point three non-Western philosophical/ethical principles were applied to the new reproductive technologies. Ahimsa, traditional to the Hindu, Jain and Buddhist religions, has non-injury as its definition and implied therein is the unerring respect for life. All three of the new medical technologies seek to mitigate injury and on their very face respect life. In the case of the fetuses (the unborn) they have karma, and are considered able to achieve nirvana. Thus, they adhere to ahimsa and to the principle of nonmaleficence. Ren is a Confucian concept that involves acting in a humane manner. (Indeed, ren encompasses humane living.) Doing what can be done to ensure that infertile couples can conceive children, or to ensure that parents carrying defective genes can have healthy children is practicing ren (humaneness). Unique to Confucian thought, the unborn are not persons, but clinicians are still required to act humanely. Personhood comes after one is born. In Sub-Saharan Africa the mindset is communitarian, and Ubuntu is the philosophical framework that underlies that communitarianism. Under Ubuntu the reproductive technologies represent the opportunity to mitigate harms (infant mortality, sickle cell anemia), and bring benefits (allow fertility to the infertile). Both of these contribute to the common “we”. These three concepts reinforce Beauchamp and Childress’ beneficence and nonmaleficence principles, and the technologies presented here can be seen as the embodiment of those principles.
AN ETHICAL ANALYSIS OF JUSTICE TO AVOID EXPLOITATION OF AND DISCRIMINATION AGAINST VULNERABLE POPULATIONS

Introduction

From roughly 1941 through 1976 the Civil Rights Movement was taking place in the United States. Issues ranging from Jim Crow legislation (the U.S. version of apartheid) and full political rights, to educational access and personal racism were being tackled. One by one these issues were fought through and, in many ways successfully resolved. Affirmative action was taken starting with an executive order in the Kennedy administration to correct the wrongs of the last two hundred-plus years, that happened to people of African descent in the country, and the mission became a policy program of the same name that included gender and other ethnic groups. Even with the substantial effort that was made in those years African American, Indigenous Americans and lately Latino Americans are, according to socio-economic statistics, the most disadvantaged racial/ethnic groups in the United States in 2017.

There is a problem that lingers after all the progress that has been made. The results of a study by Marie Plaisme et al, found that whether or not the bias is conscious prejudice and bias is a factor. Their study concerned the delivery of cardiac services to African American men. African American patients are not referred for advanced cancer treatments at the same rate as white patients, according to a study by A. M. Morris et al. Jeffrey Gerber et al, found that when it came to pediatric care African American patients were prescribed the appropriate antibiotics with less frequency.

The level of educational attainment accounts for ineffectual communication between doctors and their patients, especially if the patient is a member of a racial, ethnic or lower
socioeconomic group. The lack of specific information written or disseminated in culturally and linguistical appropriate forms, along with a general lack of availability of medical clinicians is another factor in healthcare disparities. Bigotry, both within the medical system and the larger society is also a reason why these differences in health rates exist. In a nation where access to health care is linked to ability to pay, and private insurance is the usual means for paying for care, being poor is a grave disadvantage. Low socioeconomic status or poverty has an attendant cost, a lack of the ability to access healthy whole foods which works against the effectiveness of prescribed treatments for chronic diseases, like diabetes and hypertension can be a reason clinical staff say that these patients are noncompliant or irresponsible. Factors like these contribute to the vulnerability of these minority communities.

African Americans are a prime example of a vulnerable community. Though strides have been made African Americans remain a group with only marginal power, and as a group they are still subjected to discriminatory treatment in all spaces in society. The current wave of evident examples of police brutality show that at any time the community can be attacked by agents of the state. Only negligible progress has been made in education acquisition over the last score of decades, and after the 2008 great financial recession the wealth gains of the last thirty years in the African American community have been reversed. The psychic wounds of racism run deep, and the above cited statistics about health outcomes illustrate the disadvantaged position of this community.

I intend to discuss thoroughly what vulnerability is and define it and explain the dimensions thereof, referencing the work of Hank ten Have and others. My contention is that in the 2040s enhanced persons will be few enough in number to be considered vulnerable. This is because of the fact that they are not like normative persons, and as such will be subjected to
bigotry and prejudice based upon various criteria. Article 8 of UNESCO’s UDBHR, “Respect for Human Vulnerability and Personal Integrity” will be treated. Using Beauchamp and Childress’ principlism regime, the general principle of justice will be interrogated, as well as the subject of justice for the vulnerable. Justice and civil rights and/or human rights (not limited to the U.S. Civil Rights Movement) will expand the parameters, and its application to attempts to achieve it in health care policy will be undertaken.

7.1 Vulnerability

Henk ten Have gives a surprisingly simple definition of vulnerability. An individual or community that is vulnerable is susceptible to injury, in danger of attack or damage, and capable of emotional or physical wounding.536 That is not the only definition, but it does serve as a basis from which other definitions stem. In this section vulnerability will be defined and its dimensions outlined. Some of the attributes associated either with vulnerability or combatting it will be studied, as well as what the United Nations through its UNESCO Universal Declaration on Bioethics and Human Rights makes of it.

7.1.1 Definitions and Dimensions

In the nursing literature the term vulnerability is often defined in reference to natural disasters; even if we lay aside this delimiting factor of natural disasters, the definition would still hold for this vulnerability discussion. Vulnerability refers to a population that is susceptible to damage - the relation between the magnitude of the threat and the magnitude of the existing damage, and the probability that a population will be affected by the threat found in technical studies.537 The term vulnerable refers to (a) sectors of the population such as the elderly, children, the homeless, pregnant and nursing women, all of whom are rather prone to disease or
nutritional deficiencies, and (b) groups of people for whom choice is curtailed and who are subject to being coerced when they are deliberating. Denny and Grady cite the definition promulgated in the Council for International Organizations of Medical Sciences’ Guideline 13 commentary. In that commentary vulnerability refers to the absolute or relative inability to protect one’s interests. The Canadian Tri-Council Policy (TCP) concurs with the prevailing definitions except that it introduces context into the definition, employing the language “to different degrees and at different times depending on circumstances”. This applies to both individuals and groups. Yemtsov, in a study for the World Bank on poverty and economic inequality, (cited here because income factors are germane to the concept of vulnerability in the area of biomedicine), defines vulnerability in terms of being unable to fill the need for security, the possibility because of shocks of some kind in suffering a decline in well-being, and being hamstrung to get adequate protection because protection is too expensive or impossible.

The writing of ten Have supplies the fourth source of a definition of vulnerability, and points out that in his simple definition the second use of vulnerability connotes a military interpretation. It is about a weakness or vulnerability in a defensive system, e.g. blind spots where security cameras should be. The first use is specifically about the human body. The terms injury clearly illustrates this. Disease could also be implied. Here ten Have joins Zichiata et al in concluding that the normal functioning of the body can be analyzed in terms of the possibility of harm. They describe it as an individual losing or giving up some sort of “biologic normalcy,” and the groups to which they belong are deficitary. Often vulnerability is associated with words like fragility, frailty and weakness. That is not unusual. People who cannot protect themselves from assault, or make efforts to prevent themselves from becoming ill can be seen as fragile. An elderly person, because of the effects of aging, can be seen as frail or weak.
Vulnerability is understood more and more to be the susceptibility to multiple stressors. This takes us into the stressors that cause economic vulnerability, social vulnerability, environmental vulnerability, etc. This focus expands from the basic foundation that the question vulnerable to what must be asked in a manner that limits the parameters of vulnerability. It is this wider focus that defines vulnerability more and more, and access, and treatment when accessing health care is very much a part of this focus and definition.

This leads into what ten Have calls the dimensions of vulnerability. These dimensions consist of the fact that individuals can have vulnerability, as can groups and on a more macro level whole communities and countries can be vulnerable. This is his first dimension. Within the macro application the fact is that individual members of the specified groups, communities or countries may not be vulnerable. All of these levels may not be vulnerable all of the time. This fits into the Canadian Tri-Council Policy Statement cited earlier that the degree of vulnerability depends on the circumstances.

The second dimension, according to ten Have, is that there are types of vulnerability. This is illustrated by the fact that studies of vulnerability are often categorized by area of concern. Social vulnerability is a type of vulnerability characterized by limited access to political power, knowledge, technology and information, lack of social capital and networks, certain beliefs and customs, frail and limited individuals, building stock and age, and type of infrastructure and lifelines. Disaster management has a slightly different view of vulnerability. In it the inability or diminished capacity to anticipate, cope with, resist and recover from man-made and natural disasters like hurricanes, famine and war. Isolation, poverty and defenselessness are examples of attributes that cause people to find themselves vulnerable.
Note that vulnerability includes the inability to cope and/or adapt to negative variations in circumstances.

The third dimension of vulnerability states that both external and internal conditions explain people’s vulnerability. Ten Have gives three components to this dimension. The first is exposure. Harmful threats must come as a result of external stressors. The second component is sensitivity or susceptibility to harm and/or damage. This concerns the degree of negative effect on the person or collective. Sensitivity is pre-existing in humankind prior to any negative external exposure. The third component is adaptability or the capacity to readily react. Adaptability is a short-term capacity, while reaction or response is a longer-term adjustment.549

A simpler explanation of these components follows. Every person is exposed to a myriad of stressors - germs, weather, societal violence, pollution, etc. It is the case however that some people are more sensitive/susceptible to the effects of those stressors. If its 98F degrees outside the elderly, families without air conditioning, people with health problems are more at risk to the adverse effect of high temperature. In the case of societal violence rich people can move to gated, secure subdivisions, hire bodyguards and telecommute, making them more adaptable and responsive to the stressor.

In the last part of his definition ten Have, explains its normative force. Vulnerability is conditional, and vulnerability presumes possible harms but does not presume positive outcomes.550 The conditionality of vulnerability allows that harm can come; it may not but, it is necessary to take precaution to avoid or mitigate it when it does come. Again, one may be vulnerable at one point and invulnerable at another time. In line with the second attribute, vulnerability implies possible occurrence of a negative event. It is by definition not an expectation of a positive occurrence, and intervention can happen to prevent the negative
occurrence because of the potentiality of vulnerability.\textsuperscript{551} Those interventions, along with projected responses and adaptations can be variable when applied to negative events.

\textit{7.1.2 Respect for Vulnerability: ARTICLE 8 of UNESCO’s UDBHR}

The UNESCO Universal Declaration on Bioethics and Human Rights grew out of the work done by the International Bioethics Committee (IBC), which was constituted in 1993. Their mandate was to supply expert scientific/medical information to the Director-General. In 1994 the IBC issued a report on genetic screening and testing. In 2001 a report on embryonic stem cell utilization was forwarded to the Director-General, and in 2003 reports on pre-implantation genetic diagnosis and germline intervention were done. Because of the cultural and developmental differences among and within nations the UNESCO declaration attempts to achieve universality in its principles. This article was not one of the preliminary projects that the IBC drew up. It was finalized in 2005.\textsuperscript{552}

Article 8 states: “In applying and advancing scientific knowledge, medical practice and associated technologies, human vulnerability should be taken into account. Individuals and groups of special vulnerability should be protected and the personal integrity of such individuals respected”.\textsuperscript{553} This article takes into account the fact that all of humankind is vulnerable in some way, or can be made so. A person can be subject to abuse and exploitation depending on events, or stage in life, and their level of autonomy may be irrelevant. This is because anyone, whether they are powerful, prosperous, poor or isolated, all of whom can be considered to have a high level of autonomy, can be harmed. Presidents with bodyguards have been assassinated. Poor people have been mugged. Some the wealthiest neighborhoods have been destroyed by fire or storms. The article demands that the vulnerable be protected from injury and that their integrity be respected, full in their humanity, not their constituent parts and thus as an abstraction.\textsuperscript{554} In
scientific/medical research a person must not become just their cells, disease or genetic novelty, rather their essential personal integrity must be given due respect. This article attends to any situation that violates the essential dignity of a person. Necessary harm in biomedical research is not an impediment here (e.g. extracting bone marrow, giving new drugs during trials with known or unknown side effects, etc.), and the inviolability statement concerning weighing of benefits and harm is not neutered as a result of this article’s dual purpose of respect of human vulnerability and personal integrity.555

Both integrity and vulnerability are inherently human and not exclusive, but exist in concert. The exercise of autonomy and the giving of consent do not illustrate the impossibility of vulnerability for even when such principles are followed exploitation could still take place. Generally speaking, as a matter of policy the vulnerability principle demands that no benefit to one person should be obtained by way of the exploitation of another’s weakness. Further, it must be understood that greater well-being for some if denied to others will result in greater vulnerability for those who are excluded.556 Greater still is the concept that embedded in this article is the admonition against the human body as object; now the body is embodiment of the person, the subject. Likewise, disease is only real because it exists in the life of the subject, and thus is not just an objective phenomenon. (This is not to imply that disease does not exist as an entity. Both viruses and bacteria can be viewed independently of a person.) Because of this admonition the subject/researcher and doctor/patient relationship must be modified to one in which the clinician must regard the patient/subject as part of the team, not just the location of disease, and less invasive therapies should be sought and used.557 This is the very expression of respect for the person’s integrity.
Here the application of the concepts in Article 8 in two documents will be examined. Those documents are The Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans, and The Council for International Organizations of Medical Sciences (CIOMS) and the World Health Organization, in International Ethical Guidelines for Health-related Research Involving Humans. They are comprehensive documents that illustrate largescale efforts to apply the intent of the article to medical and scientific research. The Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans states that it is a document that has as its underlying value respect for human dignity. Respect for dignity is expressed by the council as (a) respect for persons, (b) concern for welfare and (c) justice, requiring those engaged in research to treat their research subjects with the respect and consideration that is due to them, because each human being is of intrinsic worth. Respect for persons in this policy encompasses both persons themselves as participants in scientific research, the data and biological samples of persons, and reproductive matter. Those persons with diminished, impaired and developing autonomy are to be protected, and persons with full autonomy must have that autonomy respected.

The informed consent of the participants should be sought prior to the beginning of the research and should be continually updated for different phases and factors during said research. Also respect for persons involves transparency and accountability in the research. Things like coercion and undue influence, lack of information and/or understanding thus hindering free deliberation, adversely affect a person’s ability to give informed consent. Cognitive disability, age minority, illness, and specific mental illness can impair the free exercise of a person’s autonomy. These persons are vulnerable, and yet as far as they can do so, they must be allowed to participate in the decision-making process. Even if a surrogate decision-maker is employed,
their decision must be made in the best interest of the person who is vulnerable. When it comes to the possibility that a perfectly capable person could lose capacity at some point during the research, that person’s consent and wishes must be documented prior to the beginning of the research, and periodically before capacity is lost. This includes designating a surrogate.\footnote{562}

A person’s welfare involves every aspect of their lives, and all the things that interact with it, e.g. spirituality, physical and mental health, socio-economic position, family, friends, privacy, political power, etc. Being able to control any aspects of their participation in scientific studies is also part and parcel of a person’s welfare. Any negative effect upon a person’s welfare is harm. Concern for welfare in this policy demands that research ethics boards (REB) [which are the equivalent of internal review boards in the U.S.], and researchers must actively protect the welfare of participants, and when risks can be foreseen the promotion of that welfare.\footnote{563} The participants must be given all necessary information so that they can accurately assess the risks and benefits of their participation.\footnote{564} Groups specifically must have their welfare respected, because they can suffer reputational damage, be discriminated against and stigmatized, even though they can also gain from any research. Groups should be engaged if possible in the design process of the research project so that they can be aware from the beginning of the potential for risks.\footnote{565}

Justice is simply treating people equitably and fairly, with consideration and respect. No groups in society should be adversely affected by the harms of scientific research, and the benefits and/or knowledge from the research should be equitably distributed.\footnote{566} Inequities can result if differences among participants are taken into account in scientific research, therefore in some cases it is not correct to treat people justly, if that means treating every participant just the same. Vulnerability is an important difference that must be taken into account. It may be
necessary to make special accommodations in the research to assure the fair treatment of the vulnerability. A component of conducting fair and equitable scientific research is recruitment. The research question should determine inclusion, not the personal assumptions of researchers. If groups or their data are excluded for non-research related reasons, or the benefits of research are kept from them inequity exists. Finally, the imbalance of power between participant and researcher must be policed so that abuse does not exist, and information is given to the participant so that they can exercise their autonomy and decision-making.

The Council for International Organizations of Medical Sciences (CIOMS) and the World Health Organization, in International Ethical Guidelines for Health-related Research Involving Humans, which moves from the Canadian Tri-Council statement to guiding health research among medical organizations world-wide, dedicate one paragraph in their “Guideline 1: Scientific And Social Value And Respect For Rights” to the issues found in Article 8. The respect for rights and welfare is necessary to justify scientific research over and above social and scientific value. The research must be carried out in a way that shows respect for the welfare and rights of the participant, and/or groups in the community in which the research takes place. As in the Tri-Council report this respect is shown by gaining informed consent from participants, and/or communities, fairly distributing the resulting information, and fairly managing the benefits and risks both to the participant and the community.

7.2 Principiplsm: Concept Of Justice and Vulnerability

Often modern discussions of justice begin with Aristotle’s argument in Book 5 of the “Ethica Nicomachae”. In this treatise Aristotle makes the point that just action is between acting unjustly and being unjustly treated. Injustice relates to extremes and justice is a kind of mean. He goes on to write that justice only exists between those whose involvement with one
another is governed by law.\textsuperscript{573} Then he explicates what he calls political justice, which is made up of two components one of which is natural and the other which is legal. Naturalness refers to having the same force everywhere and not being confined to one’s thoughts. The legal half is called indifferent, but that indifference disappears once the law is inscribed.\textsuperscript{574} On the subject of equity or what is equitable Aristotle writes that it is not solely about what is legally just. In fact, in his argument equity is needed when the law is universally applied and is found lacking. Because the absolute law cannot be molded to fit every nuance of every situation, the concept of equity is needed to informally fill the void.\textsuperscript{575}

Aristotle was writing at a time when large-scale social justice movements as we know them today did not exist. In other words, the Civil Rights Movement, Women’s Movement, American Indian Movement, Arab Awakening, etc. as constituted within modern times’ may not have been possible, but some concepts have come down to us. Justice is about finding equilibrium, balancing the scales. It is necessary because people have to communally and personally interact with one another and legal justice helps to peacefully make that possible. However, the law cannot contort itself to fit everyone in every situation, at every time, so a sense that it is only natural that both benefits and responsibilities should be accessible to all communities and individual people must be understood.

7.2.1 An Explication of Justice

Beauchamp and Childress begin the discussion of justice with the concept of distributive justice, which they describe as the equitable and fair distribution of the rights, benefits and responsibilities that are set by the prevailing norms of society.\textsuperscript{576} This is in line with Aristotle’s political justice concept and his concept of equitability. Under principlism’s explanation of the foundation of how we think of social justice these days, this principle of fairness or equitability
falls under materialist theories of justice. Enhanced or transhumans, because they are different or non-normative persons will pose a challenge as to what is fair. The question will be what rights, responsibilities and benefits are they entitled to. In other words will transhumans be equal citizens in the countries that they inhabit. The theories are material because they specify substantive properties for distribution, and enumerate the characteristics of equal treatment of groups.  

The utilitarian theory uses social utility as its underlying principle. Each person gets what the rules and actions of society dictate everyone should get. The theory that says that a maximum of liberty and property that comes because within a free-market system, in which they have exercised the rights that are due to everyone is called libertarian. Fair procedure pervades this theory. Communitarian theory says that fair distribution comes from the conceptions of what moral communities think is good. That it is rational that each person should get an equal measure of liberty and access to property in life is an egalitarian theory. That a person should be able to exercise the capabilities essential for a full life falls under the capabilities theory. Finally, there is a theory of well-being which says that each person should be provided the means to realize the core components of well-being.  

Beauchamp and Childress call the main thrust of the theories enumerated above the fair-opportunity rule. Simply stated no one should receive more of society’s benefits because they won some lottery that advantaged them at birth, or later in life. The obverse is also true. The advantages are unearned and not deserved because of some good those who won have done. Advantages and disadvantages are attributes such as race, gender, height, social class, IQ, ethnicity, etc. Beauchamp and Childress make it clear that a strict implementation of the fair-opportunity rule would at some point have to stop. The advent of unexpected variables, and
limited resources will make this necessary. Fairness is the point; a successful outcome is not guaranteed. Some will always have more, and others will have less.

Article 10 of The UNESCO Universal Declaration on Bioethics and Human Rights states that “The fundamental equality of all human beings in dignity and rights is to be respected so that they are treated justly and equitably”.\textsuperscript{580} This follows both Aristotle, and Beauchamp and Childress. All are equal and must be treated equitably and in a just manner. In the section “Applications of the Article”, of the chapter on Article 10 the focus is on advancements in medical technology. Specifically, the point is made that as a matter of justice and equity these advancements need to be disseminated among lesser developed countries. Problems could arise as a result of these medical innovations and the article must be applied to those problems. The innovations must be scientifically-based and its potential benefits spelled out and harms mitigated. Respecting the dignity of persons means respecting their privacy, autonomy, vulnerability and personal integrity.\textsuperscript{581} Rather than giving in to the comfort that comes from the acceptance of discrimination and the othering that stigmatization represents, cultural diversity and pluralism should be encouraged and practiced.\textsuperscript{582} Achieving these goals is the way to reach a state of, according to the Declaration “fulfilling the requirements of equality, justice and equity”.\textsuperscript{583}

A further inquiry in the application of the Declaration says that while medical innovations should be available to all people (Article 15), because of the attendant costs it may not be affordable, therefore sharing these technologies may not be possible.\textsuperscript{584} The increases in healthcare costs directly are one of the causalities for reducing the amount of medical care people can afford. Those costs can also have an effect on decisions as to what kind of care will be made available to the populace. State of the art technological medical advances serve fewer
people than old fashioned medical practices. Cost is the main factor in this regard. Under-developed countries cannot afford the high-tech diagnostic machines like MRIs, or surgical robots so their citizens cannot make use of them unless they can travel for medical care. Everyone should have access to competent, basic medical care, but cutting-edge or maximal care may have to be foregone. Medical competence is needed for justice, equality and equity to be served, but so is cost-benefit analysis applied to technology.

The example of the costs that result from advances in medical technology and its effect upon the access to healthcare by poorer people is an example of a limitation of the Beauchamp and Childress’ fair-opportunity rule. The winners of the lottery are the only people, in most countries, who can take advantage of the therapies that the most technologically innovative medical practitioners make available. Even if a guaranteed minimum income is available the costs of these new technologies may continue to make them unaffordable. That does not mean that the requirements of justice, equality and equity cannot be met. A system that provides basic, competent, and thorough medical care, that is universally available may be said to meet the requirements. What is considered fair, just, and equitable regarding medical care is what the nation must figure out.

7.2.2 Justice for the Vulnerable: Its Application to Posthumans

The question that must be asked here is: How could posthumans be considered vulnerable. An answer to the question need only look to the definitions of vulnerability. Mutamad Amin et al. in their paper which offers a framework for including a human rights regime and vulnerable populations in the development of health policies, define vulnerable groups as being likely to experience wrongs, and encounter barriers. Ten Have’s three components of vulnerability support and expand Amin, citing exposure where external stresses
can lead to harms to the subject, sensitivity where the subject is susceptible to these harms, and adaptability, i.e. can the subject adapt easily or at all to the harm. 588 Dos Anjos points out that exposure is the only external factor that is a condition of vulnerability. Sensitivity and adaptability are both internal to the subject, sensitivity is the effects of reaction within the individual or group to the outside factor to which they were exposed. 589 Adaptability refers to the internal factors which allow the individual or group to continue and/or thrive after their exposure to the outside factor.

Savulescu, Liao and Wasserman give an overview of three of the main objectives of human enhancement, cognitive enhancement, life extension and mood enhancement which is something that one rarely sees in the literature surrounding the ethics of enhancement. 590 In the book entitled Human Enhancement edited by Nick Bostrom and himself, Savulescu in a discussion of personism proposes a scenario in which posthumans present as far more intelligent than normative humans. These enhanced humans are also exponentially more compassionate and wise than is normal. Savulescu also writes that they can be coded genetically to the superior attributes of other animals, i.e. enhanced with DNA from other animal species. 591 How would people feel about people who can navigate by sonar, have the hearing of dogs or elephants, and have the vision of owls and eagles? While Bostrom in his book Superintelligence seeks to take the reader into all of the possibilities by which enhanced intelligence can be achieved, such as selecting embryos with genetic indications of high intelligence for implantation, somatic gene enhancement and brain-computer interface, in his essay “Why I Want to be a Posthuman When I Grow Up” he presents a more to the point explication of why posthumanism is desirable. He ties it to an enhancement of healthspan, cognition and emotion that greatly exceeds that which is normative. 592
Bostrom writes about two stages of posthumanism. The first has to do with one’s initial development into a posthuman. One would start by enjoying one’s enhanced capacities such as healing more quickly than is normal, as well as not being as susceptible to certain illnesses. A greater clarity and depth of thought is something one notices. Recall and learning are magnified. Because one’s enhancement is also emotional life and the experience of it is more vivid and valuable. One is slower to anger and more inclined to balance. Finally, because one’s lifespan is greatly increased one’s worldview is longer in range, and one understands far more accurately what is of import than normative people.  

Bostrom’s second stage begins with the posthuman being 170 years old. In that time the posthuman will have developed new artforms, more complicated and beautiful music than that which is considered the pinnacle today. Among those who are posthuman a new more exacting and expressive sort of language would grow in use so that thought and emotions can be accurately conveyed. This is not a language that the unaugmented, as Bostrom calls them, can use. He then says that the posthuman will play a game that is an amalgamation of “VR-mediated artistic expression, dance, humor, interpersonal dynamics, and various novel faculties and the emergent phenomena they make possible”. The posthumans will be creating new realms of abstract and concrete beauty.

Savulescu writes that the central argument of his chapter, and, I would add, indeed this dissertation, comes from the movement for animal rights. What do humans owe other non-human animals? That question concerns what humans owe posthumans, e.g. persons who are not the kind of humans that we are. Can and should enhanced or posthumans be regarded as people like us? Savulescu writes about anthropocentrism, referencing and privileging homo sapiens, listing its underlying characteristics as human prejudice. These characteristics are the privileging
of human beings in ethical thought, what happens to human beings is more important than what befalls other animals, and human beings can claim our care and attention in all situations where other creature cannot as they have no claim upon us.  

Now we come back to question of how posthumans could be considered vulnerable. People who can reasonably expect to live to be 200 years old, and in mostly good health are different. People who have the visual acuity of an eagle and the night vision of an owl are strange. People who can navigate their way with sonar are not like us. People who can hear at greater distances and at the lowest and highest frequencies sound almost vampiric. People, that is, human beings cannot do any of these things. These people are genetically engineered, or have been synthetically or cybernetically modified. They can feel everything and experience everything to its fullest and remember these feelings almost eidetically. They don’t speak like regular people (reference the language they created). Their game is technologically augmented and nearly extrasensory in nature. Regular people cannot play it because we cannot understand it.

These things begin to explain why posthumans will at least at first be vulnerable. In a macro sense they will be vulnerable because they will be much fewer in number for at least a generation when they begin to appear. They will be vulnerable because they will be subject to forces outside of their control, like governments, who will make decisions as to whether the technologies that are used to create them, and/or enhance humans will be allowed to continue. Like Jews, people of African descent, Yazidis they can, and quite possible will be subject to prejudice from normative humans. They could be seen as perversions of humanity, i.e. deviations from what God created humans to be. They could just be viewed as novelties born to entertain. Finally, they could be envied and feared because they are more intelligent, wise, just, compassionate, artistically gifted, healthier, attractive, emotionally stable, etc. than normative
humans. To begin the process of moving toward justice for posthumans Savulescu calls on normative human beings to lose human prejudice.\textsuperscript{597} Adding these posthumans to those covered under human rights regimes would further the application of justice to them.

7.3 Justice and Civil Rights

The argument comes back to rights again. If current principles of ethics are based upon the universality of human rights, the assumption of the rightness of being just, and statutory requirement, i.e. law, then enhanced or posthumans must be incorporated into those ethical principles. Exploitation must be avoided, and specific to the subject of this dissertation, healthcare policy must be applied to or created for the protection of the enhanced humans.

7.3.1 Envy and the Question of Exploitation

Previously, the fact that at first the number of posthumans will be small, that they will be different, subject to forces outside of their control, and gifted was used to show that they will be vulnerable. The enhancements they have can also be the agent of their exploitation. Above prejudice entered the argument as a part of the forces that can make the posthuman vulnerable, in this section I will introduce envy and its corrosive power into consideration, and how it can lead to the exploitation of those who are enhanced.

Richard Smith and Sung Hee Kim, in 2007, combined an extensive literature review with original research to understand what envy is and how it manifests. Their conclusion was that envy at its heart is comprised of resentment, hostility and inferiority.\textsuperscript{598} In other words, envy arises when one sees someone that one perceives has an advantage over one’s self and one has a negative emotional reaction to the person’s perceived advantage.\textsuperscript{599} Smith and Kim go through the kinds of envy to highlight that what they are talking about comes in degrees. Envy proper is
the standard dictionary definition, and benign envy can be a motivating factor to self-improvement. Longing can, and usually is, part of envy whether benign or not. In its benign state the longing is directed toward acquiring the quality that one admires. It is not focused on a covetousness that desires to harm the person in possession of the longed-for quality. Envy should not be confused with jealousy in that jealousy usually is concerned with someone “taking” another person from someone, while envy grows out of a perceived injustice. Someone has something that I should have, or some group has more than they should have, or are more favored than my group is. Further, according to Macintosh, envy can lead to resentment proper. (Macintosh offers a more succinct account of how this comes about, so I will use it.)

Unacknowledged envy can lead to projection of moral failings onto those who are envied. Those who are envious justify their hostility and resort first to covert negative actions against those they envy. Once any sort of objective injustice can be perceived, or actually found against the rival, then the one or ones who are envious can recruit others to their cause. This is because they feel that they have reached resentment proper. If this projection happens to a group, then stereotyping can occur, and that can lead to ostracizing and violence.

Being the possessors of extraordinary abilities and strengths, as well as much longer lifespans and exemplary health can lead to resentment. That resentment can grow into an effort to eliminate or control the proliferation of this new species. It could also spark an effort to scapegoat and dominate these enhanced beings, and exploit their strengths and abilities. Peter Glick defines scapegoating as “an extreme form of prejudice in which an outgroup is unfairly blamed for having intentionally caused an ingroup’s misfortunes”. His chapter and like titled article, dealt with envy as a major cause that led to the Jewish Holocaust in Europe. I will assume that normative people will not go so far as to seek to exterminate the new species, but I do think
that exploitation can happen. Because, as I have written above, people often fear what they don’t fully understand, envy may cause a number of them to see themselves at a disadvantage, and fear of what the posthumans could do can result in resentment proper. This resentment can then lead to programs, particularly for the young, to direct and develop the gifts the enhanced persons possess. Laws may be promulgated that in some way curtail the use of special talents, and display of certain abilities. An emotional tack could be taken that strongly focuses on making the enhanced person feel obligated to use their gifts for the good of normative persons. Whether or not this sort of use is good for posthumans would not be given the same importance.

7.3.2 Ensuring Justice with Health Care Policy

While the current human rights frameworks, whether multilateral or community-based, provides a basis upon which to accept the advent of posthumans, and help them find a place in the world it may be necessary to create policies specifically tailored for them. In this section a detailed explication of targeted healthcare policy within the United States will be used to illustrate this point.

It is important to point out that in the United States’ federal system healthcare policy is compartmentalized. The federal or national government has very specific healthcare programs for which it is responsible. These include the Medicare and Medicaid programs, programs specific to the Department of Health and Human Services, the Veterans Affairs hospitals and medical programs, and programs subsumed in the programs for native Alaskans and American Indians. Also, the United States Congress is responsible for legislation food, drugs, disease prevention, medical research and lately, homeland security.
The roll of states is more hands-on. The states not only must administer programs like Medicaid and food stamps or SNAP, they also have to regulate the activities of various stakeholders in the healthcare industry. States, through their lawmaking authority, act as guardians of the public health. They jointly fund (purchase) Medicaid with the federal government, and provide insurance to state workers. States also regulate and license health professionals and regulate insurance companies. Along with the federal government the states monitor adherence to environmental standards. All of these things as well as helping to fund community-based clinics and programs help states act as providers of a healthcare safety net. Educating the public about health and safety risks, and providing subsidization of medical education in various ways is largely a state function, and, finally, states act as laboratories for medical policy. (Massachusetts through its 2006 Act Providing Access to Affordable, Quality, Accountable Health Care became a laboratory for the Federal affordable Care Act.)

Local or county governments through indigent care services such as drop-in clinics and public hospitals contribute to healthcare provision and policy. They regulate things like trash collection, smoking in public and closed spaces, and cleanliness standards in public accommodations. Local governments, like the state provide public health information to their citizens.

All of the above illustrates that the three levels of government in the United States have carved out or been assigned a roll in the area of healthcare policy and delivery. Here examples of programs that seek to better the lot of particular groups will be given. The first example concerns senior citizens. The Centers for Medicare and Medicaid Services (CMS), once the Health Care Financing Administration, has as its mandate to facilitate the implementation of the Medicare and Medicaid programs. It also is the applied arm of the federal government’s policy toward the
senior population of the United States. That policy can be found in the Older Americans Act, Section 101 (P.L. 89-73). Some of its objectives are to assure that older Americans have an adequate retirement income, that they have access to the best physical and mental health care, access to affordable, serviceable housing, access to suitable employment without discrimination, retirement with dignity, health and honor, access to community-based services, restorative and long-term services, and support for their caregivers, that they have the ability to participate in the life of the community, access to immediate benefit from medical and scientific research, access to efficient social services within the community, and finally older Americans should have the freedom to live their lives as they desire without being subjected to abuse, exploitation or neglect.609

The second example concerns HIV/AIDS in nonwhite populations. Because HIV/AIDS was and is still transmitted at a higher rate among minority populations in the United States than it is in the majority Caucasian population government agencies have been tasked with trying to lower the rate of transmission and assure access to proper treatment. The Minority HIV/AIDS Initiative is a coordinated program between the Department of Health and Human Services and the Congressional Black Caucus. It began with an allocation of $156 million in 1999, and that was increased in 2000 to $251 million. The funds are distributed for the purposes of strengthening linkages to stakeholders and facilitators that address the needs which are specific to the various minority communities, providing infrastructure and technical support to these communities to battle HIV/AIDS, and increasing access to care and prevention of HIV/AIDS.610

Native Americans are the population with which the third example is concerned. The Native American population has a separate carve-out within the Department of Health and Human Services called the Indian Health Service. The Indian Health Service is the principal
federal advocate on health issues and health care provider for Indian people, and its goal is to raise their health status to the highest possible level. It provides a comprehensive health service delivery system for approximately 2.2 million American Indians and Alaska Natives. The Service, because it is dedicated to one specific ethnic population, has developed programs that address morbidities that are prevalent within that population. Diabetes is targeted by the National Diabetes Program. To address heart disease in 1993 the Southwest Native American Cardiology Program was created, and Native American seniors have the Elder Care Initiative.

Conclusion

In general vulnerability refers to being capable of being harmed. Vulnerability can be applicable to individuals and to entire communities. It is the function of exposure to an outside instigator, an internal reaction or sensitivity to exposure, and the level of the capacity to properly respond to or adapt to the circumstances created by the vehicle of the exposure. Status in life does not shield one from any and all exposure to harms.

Article 8 of UNESCO’s Universal Declaration on Bioethics and Human Rights seeks to promulgate a universally applicable standard of respect for human vulnerability and personal integrity when engaging in medical and scientific experimentation and research, and technological advancement in those areas. In conjunction with Article 10’s call for equality, justice and equity the groundwork is laid for normative persons vulnerable or not to be treating fairly and incorporated into the life of humankind. The universality of these declarative articles transcends cultures, nationalities, and identity groups. Both The Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans and The Council for International Organizations of Medical Sciences (CIOMS) and the World Health Organization, in
International Ethical Guidelines for Health-related Research Involving Humans are examples of documents that offer a framework in which Article 8 can be applied.

Beauchamp and Childress principle of justice though it does not come from UNESCO’s declaration, can also be seen as universal. They treat the concept of justice extensively, but ultimately the argument they make is one of fairness, be it of opportunity or in the case of medical care fairness of diagnosis and treatment. The same goes for scientific research; the subject (person) must be treated with respect for their vulnerability and personal integrity. They must be given the same level of care regardless of identity factors i.e. religion, gender, nationality, race, ethnicity, socioeconomic group, etc..

Justice in the way of fairness must be applied to enhanced or transhumans, because in 2040, the year in which the case study of Alassane Marius is set, these sorts of persons are a small minority group. They face many biases and in some cases discrimination. Part of this is driven by the envy of normative persons, who do not have the special skills or attributes that are outlined above. Part of this is driven by an objection to human enhancement, and the progeny that are the result of it. Just like programs have been constructed to aid in tackling problems for specific communities, additional consideration will need to be given to transhumans who will be vulnerable because of their small number. The argument may be made that not every enhanced person will be as vulnerable as the other, because their particular enhancement could make them almost superhuman, but that does not negate the vulnerability of transhumans as a whole.
THE PRINCIPLE OF PARTICULARITY

Introduction

In these final chapters we are in the year 2040 and the new species of enhanced, post or transhumans is a fait accompli. The evolution of humankind has in some cases been directed by humans. The imaginations of science fiction and fantasy writers have been proven true in a manner of speaking. The more outlandish predictions have not come to fruition, but there is enough of a difference within these new people to draw notice. Of course, there is objection to this evolution by those of particular religious beliefs. However, objections have come also from those who hold a precautionary worldview that is not informed by religious belief. People who see genetic engineering as their only way to procreate are ecstatic about their progeny. Another point of view is that of people who see this advancement as the dawning of a new horizon. It can be said that they subscribe to the belief in what Blake referred to as the “golden amour of science”, and therefore they, at least as far as human evolution is concerned, can rejoice that “the dark Religions are departed and sweet Science reigns”.  

In November of 2018 Chinese scientist He Jiankui, an associate professor at the Southern University of Science and Technology in Shenzhen, China, announced that he used the CRISPR-Cas9 technique to modify the genes of twins, protecting them from HIV infection, and that he had “deliberately evaded oversight”. Xu Nanping, China’s vice minister of science and technology, after the uproar this announcement caused, said that the ministry opposed the experiment and ordered that it be suspended. The genie had been let out of the bottle and China became the country that ushered in the age of posthumanism. In the hypothetical story that we will analyze, artificial intelligence is a technology in which China leads the world in 2040,
and human directed evolution has led to China’s being the country where the larger number of transhumans can be found. Medical tourism which has been practiced for many years when people wanted cheaper procedures, organ transplants and babies, is now also used for enhanced offspring. China is doing quite well in this area, with patients coming from all over the world.

As a result of this progress we now have a generation of transhumans who are functioning in various societies worldwide. In this chapter we will return to the case of Alassane and his family in light of the dominant principlism paradigm. Under the general rubric of compassion people will say that these new people should be granted access to hospital care, and that they should be properly treated. But will a fellow feeling, the root of sympathy from which compassion evolved, be enough when people are something different from the normative person? Is it enough to cause the clinical staff to act in the best interest of the patient? The fellow feeling will not be enough, but compassion can be enough to cause the staff to act in the patient’s best interest, but something will be missing. I will, therefore, argue that beneficence and nonmaleficence, which are just both sides of the same coin, are good, but from them proper treatment of enhanced people require a principle called particularity. In this principle the central concept is that the enhanced person must be treated in a manner that is consistently informed by their enhancement. Even if the ailment is not located within the enhancement itself that enhancement must be taken into account during diagnosis and treatment. If an ailment is normative in origin, i.e. manifesting as it would in a normative person, the enhancement must be taken into account during diagnosis, and must figure in treatment and therapy. The specific enhancement/s are integral to the patient and therefore diagnosis and treatment is only properly done when the enhancement is integral to the diagnosis and subsequent treatment. These new kinds of people are different from normative people, and they may also be different from each
other. I will show how this principle does or does not work when Alassane Marius is admitted to the hospital.

### 8.1 From Beneficence and Non-maleficence to Particularity

Beneficence and nonmaleficence, as stated above, can be said to be two sides of the same coin, but it is better to see them as a closing of a circle. First, beneficence implies contributing to the welfare of another person. In this case, it refers to the clinical staff’s moral obligation to act for the benefit, or as it is most often stated in the best interest of the patient. While self-sacrifice is considered an example of ideal beneficence, Beauchamp and Childress list five prima facie rules of obligatory beneficence. They are to (1) protect and defend other peoples’ rights, (2) rescue one in danger, (3) remove the conditions that can cause harm, (4) prevent harm to others and (5) help the disabled.\(^{616}\) The beneficence to which clinical staff is obligated is specific in that it is directed toward specific persons, and it is predicated on moral relations, contracts and/or special commitments. W. D. Ross, in his book The Right and the Good, was a proponent of a more general beneficence, not just that which is due someone because of our relationship to them, or our position in society, but a benevolence or right predicated on the fact that there are other people in the world who need our help.\(^ {617}\)

If beneficence is the snake’s head then it is biting its tail, which is nonmaleficence. Nonmaleficence is the abstaining from doing harm to another. Frankena formed his principles of beneficence beginning with nonmaleficence, i.e. one shouldn’t inflict evil or harm, but one should do and promote good, prevent harm or evil, and remove harm or evil. Avoidance is what is called upon in nonmaleficence, whereas in beneficence action is required. Harm is setting back, thwarting or defeating the interest or progress of someone else. It is not always unjustified or wrong. More cogent to this argument is the definition of harm as setbacks to the physical
and/or psychological interests of a person such as involves health and/or survival. A simple statement of the rules of nonmaleficence is don’t kill, incapacitate, cause offence, inflict pain or suffering, or deprive someone of the goods of life.\textsuperscript{618} In order to properly practice nonmaleficence a physician must exercise due care and avoid negligence. A reasonable and prudent person takes appropriate care to avoid causing harm as the circumstances demand. The ends that are pursued must justify the risks that have to be imposed to meet them, if the standard of due care is to be met. Not meeting this standard, not exercising due care is negligence. Negligence can happen advertently or inadvertently, i.e. it can come about by the intentional imposition of unreasonable risk of harm, or it can happen because of careless, though unintentional imposing of the risk of harm. To have failed in his/her duty to practice due care a physician must have a duty to the affected party and have breached that duty, causing that party harm.\textsuperscript{619}

An argument needs to be made here for sympathy as expressed in compassion, as a key component that leads to the practice of beneficence/nonmaleficence. Hobbes called that sympathy pity in his 1651 book Leviathan. He wrote grief is pity for others as a result of their having experienced calamity, and it comes because the observer can see that the same thing can happen to them.\textsuperscript{620} Andre Comte-Sponville, in his chapter on compassion, begins his explication with sympathy and defines it as “fellow feeling”.\textsuperscript{621} Sympathy then is about likeability, niceness. It is about both the feeling itself and the quality of fellow feeling in the individual.\textsuperscript{622} If the person with whom we sympathize is likeable and pleasant to us should we sympathize with them in total? Suppose that they are filled with hatred for a certain racial group should we sympathize with this hatred? Morally we can say that we should not. This could be said to open the door to
distancing one’s self from clinically treating them, because they are not good and pleasant. We cannot sympathize with their hatred.  

There is a feeling, an emotion that can allow us to rightly, if we are clinical staff, treat this unpleasant person. That emotion is compassion. According to Comte-Sponville compassion means “to suffer with”. Compassion is a universal moral principle because it is not dependent upon the morality of the object of that compassion. Thomasine Kushner in dialogue with David Thomasma says that compassion may have grown out of understanding that we are all as humans connected in many ways. Compassion requires then that we must develop an awareness that what we do or don’t do affects other people’s lives. Thomasma goes further and says that compassion is a virtue that causes one to move from just feeling to active care behavior. In medicine the clinical staff must be able to feel with the sick, to participate in their illness, therapies and recovery. Kushner takes up the argument again, making the point that compassion causes one to relieve pain and suffering, and thus not to add to that pain and suffering. It also should cause one to act for others. In both statements we see the virtuous genesis of do no harm, and acting in the best interest of the patient, i.e. nonmaleficence and beneficence. Kushner goes further and argues that compassion benefits not only the patient but also benefits the caregiver, because suffering with them allows the caregiver to see beyond issues that cause self-absorption, and at least temporarily to be removed from individuality.

Jos Welie makes a point that is very pertinent here. What he calls intersubjectivity is rather automatic; because one becomes aware of the values, feelings and interests of others. Doctors and patients do this. It follows that it should be necessary for there to be an amicable, easy relationship between the patient and her/his doctor. However, patients can close themselves off from their doctor, but this does not prevent the doctor from assessing what is in that patient’s
best interest. The doctor may not be able to sympathize because the patient makes it too difficult, but the doctor still can join with the patient in their healing program.630

Eric Cassell in his book entitled The Nature of Suffering and the Goals of Medicine, makes the point that (1) suffering or illness (my addition) is experienced by a person, and that knowledge requires letting go of the phony duality of mind and body; (2) suffering or illness happens when a threat to the wholeness and/or survival of the person is found, and it continues until that threat is eliminated through intervention or goes away on its own, and (3) suffering or illness can happen to any specific part/s of a person.631 In other words, the whole person gets ill and needs to be treated. In their section called “The Healers” Thomasma and Kushner simplify Cassell’s three points. They write that human illness is holistic in that the whole person, the mind, body and spirit are ill.632 They also use the language of particularity though in reference to different attributes than I will cite later in this chapter, however their language is still applicable. They write that the particularities of culture, language and ethnicity make illness a personal and unique experience, specific to the person. Thus, to really heal these people these particularities must be acknowledged and worked into the treatment of these patients.633 For enhanced, post or transhumans this particularity will be crucial; since these persons are not like the majority, no matter how slight it is, a miscalculation can cause irreparable harm to these new beings.
8.2 The case: How Alassane and his sister Armana were conceived, Alassane’s medical issues

Alassane and his sister Armana were not conceived the way normative persons are conceived. They have three biological parents and are a symphony of CRISPR Cas9 cut and pasting. They have three biological parents because the mitochondrial DNA from another woman was placed in their mother’s eggs because her mitochondria had the genes for mtDNA depletion syndrome that young Charlie Gard, who was discussed in Chapter 5, had. MRT or mitochondrial replacement therapy, removing the nuclei from an ovum of one woman, placing it into a donor ovum to be fertilized with spermatozoa, was used to assure the children would be born without the syndrome.\textsuperscript{634} CRISPR Cas9, the gene editing tool was used to knock out a few less desirable genes, but several new genes were added to the siblings genomes. This genetic material was transgenic because they were genes from other organisms.\textsuperscript{635} All of this led to the creation of persons who were physically very unique.

8.2.1 Alassane Goes to the Hospital

Here is an expanded reiteration of the case presented in the first chapter. Alassane Marius goes into the Provident Hospital Los Angeles presenting with the symptoms of an acute viral infection. There is some concern among the resident physicians that the infection might be bacterial instead. Alassane who is twenty-seven years old, is rather androgynous, over six feet, eight inches tall, with curly silver hair and acutely aquiline features. Alassane is running a fever when he arrives at the hospital and his sea-green skin is bioluminesing in waves, as are the violet rods in his emerald eyes, after he comes under the ultraviolet lights at the ED entrance. When he speaks most of the polyphony is missing from his voice, leaving a flat monotone. His normal temperature is 30\textdegree C or 86\textdegree F, however he is running a temperature of 41\textdegree C or 105.5\textdegree F.
Normally his heartbeat is rather slow, about 40 bpm; on this occasion it has almost doubled to 76 bpm. When he arrived at the hospital he told the doctor in the emergency department (ED) that the symptoms started three days ago. His heart rate started speeding up, he felt uncomfortable in the lower abdomen, and his skin tended toward a yellowish hue. The next day his skin was orange when he woke up and hot, and he noticed a lot of confusion. He ate much more than is normal for him. The pain got better immediately after he ate, but within two hours it got worse, and he had multiple bowel movements.

Alassane, though he was extremely nauseous and in a lot of pain when he got to the emergency department, managed to call his parents and sister Armana. His parents arrived about a half hour after him, and to the clinical staff they appeared to be normal biracial (African and Asian) people, but his thirty year old sister with her burnt umber iridescent skin, jet black hair and violet eyes cause several staff members to do a double take. She is her brother’s height and the staff notices that she speaks as though she is singing. The staff stumbles through trying to ascertain the siblings’ gender. (They didn’t ask Alassane his gender, but rather saw it during examination.) A nurse assumed from his manner of speaking that he must be under the influence of alcohol or some drug, again they never asked him.

The nurse, Beverly, is the one who assumed that Alassane was intoxicated. The fact that she jumped to a conclusion is not something that was unique in the ED that day. The clinical staff understood that he is one of the new people; that was obvious, but most of them regarded him as strange rather than different. The appearance of his sister, both how she looked and that she was there, did nothing to help their perception of him. When the ED resident physician did the initial interview with him Alassane told the doctor about his pain but he was given no pain medication. The doctor, David Astin, suggested that they “wait a little while to see if the pain
goes away on its own”, because he was predisposed to believe what the nurses were saying. Rather than treat his patient’s pain, Dr. Astin did order a blood test to ascertain whether Alassane was drunk before he came to the new patient’s bedside. This reticence to treat Alassane’s pain is characteristic of resident physicians’ behavior towards minorities as was documented in the Proceedings of the National Academy of Sciences, in April 2016. In the second part of a two-part study Kelly Hoffman et. al. were able to show that medical students and residents, though to a lesser extent, held false beliefs about innate biological differences between blacks and whites. The study also found that these beliefs caused the residents to perceive black patients differently than their white patients, and medically to treat them differently, including the monitoring and management of pain.636

None of the clinical staff asked Alassane about who he was, but they did ask about insurance coverage. They did not take a medical history for him or his family. They did not inquire of him as to what was normal for him physically. The pertinent questions would have been these: Mr. Marius the normal body temperature for people like me is 98.6°F, is it the same for people like you? Your skin is orange, is that your normal skin color? What is the normal texture of your skin? How often have you been sick in the past, and if you have been sick what did you have? Do these illnesses run in your family? Now in 2040 all medical records are digital, but they are very technical. The nuances are missing so it is still necessary to interview the patient. Alassane may have been sick in the past but he may not have had to go to the doctor, or be hospitalized because of that sickness. He told the ED staff the things cited above, but the staff did not ask for more detail. The kinds of questions asked should have been like these: Did these symptoms start after a meal? Did they come on suddenly or gradually? Have you had these symptoms before? If they are recurring what exactly made you come into the ED this time? On a
scale of one to ten what number shows your pain level, ten being the worse pain? How would you describe it… stabbing, cutting, dull and widespread or radiating? Other than the phlebotomist drawing blood the staff left him alone until his family arrived.

When his sister Armana and his parents arrived the staff became a bit more attentive, but that was because of his normal parents, and the fact that his transhuman sister was a famous and aggressive attorney, and the personality that goes with that profession became evident almost immediately. Dr. Astin came back just as the Mariuses got to Alassane’s bedside. Finally, here were two normal people to talk to. He introduced himself and let them know that he was waiting to get the blood test results. He also said, “We’re just waiting to see what happens; it may all just go away”. As Dr. Astin walked away Mr. and Mrs. Marius busied themselves talking with their son and encouraging him. Armana spent about five minutes talking to her brother, and then walked over to the nurse’ station and asked where the attending physician was. She was told that she (the attending physician) would not be in again until 8 o’clock in the morning. Armana thought to herself that it was good that Dr. Astin had ordered blood tests, but his attitude was wrong. There didn’t seem to be the usual anti-transhuman prejudice, but she noticed a certain nonchalance in his manner.

At around 9 o’clock the next morning the attending physician, Dr. Lana Moton, came into the room on the ward where Alassane had been taken. The results from the blood test were back. Alassane was not intoxicated, but he was shaking in pain. Armana did not wait for her parents to speak; she was livid. “Are you still suffering from the belief that persons who are different from you don’t feel pain the same as you do, like medical students thought about black people back in 2015”, she snapped at the doctor. Dr. Moton is known for her calm demeanor. Unflappable is the word often heard in relation to her, so she calmly answered “No, and I’ve
ordered an ibuprofen drip for your brother and an x-ray of his chest; Dr. Astin is a resident and I
don’t think that he has treated transhuman patients before”. Mr. and Mrs. Marius quietly smiled
in the doctor’s direction, but Armana was not placated…” Doctor that’s not an acceptable
excuse; frankly my brother has spent a night needlessly suffering because of the bigotry of the
staff here. I even heard that the nursing staff assumed that Alassane was drunk, had they asked
any of us they would have found out that my brother and I have an acute allergy to alcohol”.

The enhancements that the Marius siblings possess manifest in ways other than those that
are physically obvious. Alcohol makes them violently ill, so much so that they cannot use certain
cough medicines or mouthwashes. Though they cannot breathe under water both Alassane and
Armana can hold their breaths for at least fifteen minutes between breaths. They can eat meat but
sparingly, therefore their diet is 90% vegetarian. Their emotional intelligence is prodigious, and
their limbic system seems to be attuned to fear and other feelings in the way so-called lower
animals’ systems are attuned. Alassane and his sister age slowly, and that partially accounts for
his androgyny. His IQ is 200 points like Armana’s, but his body is that of a tall, lanky 13 year
old boy. He has not been sick at all during his life. His sister had an inexplicable fever once
when she was a year old. Their parents rarely get sick, and as they near sixty years old their
health is exceptional. Mr. Marius’ father suffered from digestive problems all of his adult life,
ultimately dying of colon cancer. Armana and her brother’s hearing, eyesight, tactile sensitivity,
taste and smell are far more developed than normative humans, and they tend to see all
situations, concepts, etc. in a wholistic manner. (Dr. Astin thought that Alassane probably had
the flu when he saw him. That was going around lately, but he never made any effort to actually
talk with his patient. He took notes of what Alassane told him, ordered the blood test and went
on to other things.) During the night Alassane’s color had become a persistent gray with a slight
greenish tint. He was coughing now, and his head was throbbing. The symptoms with which he initially presented were still present. The ibuprofen drip was not doing much to help.

Armana got more annoyed when Dr. Moton said that all signs pointed to the flu, and that she had just ordered tests before she walked in. Armana pointed out that her brother’s belly seemed rather concave and that her brother was really complaining about pain there the most. Because of their enhancements there is a modification to their intestines and stomach, such that sucking the belly in is nearly impossible. She also asked the doctor if she was aware that she and Alassane could calm themselves so that they could guide people through their bodies, giving nearly minute detail as to what they were feeling and hearing internally. Dr. Moton listened but said that she was pretty sure her brother had a version of the flu, and was just manifesting more acutely to it. The doctor also ordered a course of Tamiflu. The tests ordered were rapid influenza diagnostic tests (RIDT) to ascertain both whether influenza was actually present and if so what strain was present, and rapid molecular assays. Dr. Moton decided that she would, if needed, use an immunofluorescence test.638

Both the RIDT and the rapid molecular assay came back inconclusive or negative, so Dr. Moton ordered an immunofluorescence test. It did not prove perfectly positive for influenza. Alassane had, however, been given his first dose of Tamiflu and he vomited up everything in his abdomen about fifteen minutes later. Armana convinced her father to insist that the staff pay attention to Alassane’s abdominal complaints. The staff was polite with Mr. Marius, (he was a cute, nice older gentleman), but they dismissed his entreaties. An hour and a half had passed when Armana finally convinced her father that Alassane needed to go to another hospital and the next day he was a patient at Bunkerhill Hospital.639
Several typical assumptions were made by the staff at Provident hospital. These were made by the nurses, resident and attending physician. The first was that Alassane was drunk. Why, because he sounded drunk and was acting drunk. Dr. Astin also thought that Alassane probably had the flu, but he did not order any tests to ascertain whether that was the case. Dr. Moton assumed that the flu was the problem, and so she dismissed what Armana told her. Dr. Moton did pay attention to the fact that Alassane was experiencing pain and she assumed that ibuprofen would be an innocuous choice for pain relief, especially if it was diluted in a bag. She did not, however, ask if her patient had any allergy or sensitivity to specific painkillers. The ultimate assumption, and this will be explicated to a greater degree in the next chapter, was that both the presenting patient and his sister were strange rather than different.

These assumptions both illustrate and led to medical errors, the kind of errors that Leape, et al outlined in “Preventing Medical Injury” in 1993. A medical error is defined in the American Medical Association’s patient safety guide as an act of omission or commission leading to a negative outcome or nearly to such an outcome. This is a general definition. More exacting is an adverse event, which is an injury caused by medical care, and a near miss/close call which is a negative event that only by chance did not happen. The assumption that Alassane was drunk was an error in diagnosis, as was Dr. Moton’s assumption of influenza. The wrongful diagnosis, initially based upon gossip, led to unnecessary blood testing, and lost time in formulating a proper diagnosis. The argument could be made that this initial assumption was reasonable, but he did not interview his patient in any depth, so his ability to arrive at a proper diagnosis was impossible. Anyone else who was so nauseous, whose speech was that slurred, and had that kind of stomachache was usually intoxicated. He’d seen it over and over with
normative patients, but just to look at Alassane there could have been no basis for the assumption that he was a normative person. He arrived in the ED sea-green to orange in color and his skin was bioluminesing. His hair was silver. The violet rods in his eyes which are emerald colored, were also luminesing. Everything about his appearance spoke to his having been enhanced. None of this was taken into account as part of the evaluation and diagnosis process. It was used to mark his weirdness.

Both Dr. Astin and his supervisor Dr. Moton, further compounded the errors with a misdiagnosis of influenza. This led to proper testing to ascertain whether there was in fact influenza present, but before all the results were finalized the patient was given Tamiflu. This made him sicker. Unlike Dr. Astin, Dr. Moton tried to relieve Alassane’s pain, but the drug she used, like the Tamiflu, made his condition worse. He ended up with a bacterial infection because of this medication error. In both cases these were errors in treatment. No one adequately monitored Alassane during his initial night in Provident. His sister had to aggressively advocate for her brother to get anyone to check on him. This was a failure of preventative care, and thus a medical error.

In all three cases this patient’s difference or strangeness to the staff allowed the staff the neglect the most basic of medical procedures. They made no effort to understand what kind of person Alassane, their patient, was neither did they try to understand who he was. It was absolutely necessary to find out what his enhancements were by way of observation, but equally necessary was a comprehensive clinical interview. They needed to pay attention to his differences. That was vital and they did not do it.
8.3 Particularity applied to Alassane and his medical treatment

Bunkerhill Hospital is a specialized facility in which the staff is nearly equally divided between regular clinical and nonclinical employees, and medical and other specialized technologists. Creation of new or modified medical devices can be done whenever it is needed. Patients wear wristbands so that their vitals are constantly monitored, and the staff always knows exactly where they are. A team of clinical staff apprises patients of the various aspects of their case on an on-going basis, and technical staff is often called upon to explain the devices that are being used in the patient’s diagnosis and treatment. Cameras allow patients to be seen by licensed practical nurses and/or physician’s assistants who watch the screens during their shifts. Clinical staff and volunteer patient observers check on patients at frequent varying intervals.

Access to all of a patient’s information is instant, available on the walls of the patient’s room, which double as screens. The patient can also access the information on the wall by way of the tablet on their bedside. Links to specific medical terminology are embedded in the display that the patient sees so that they can understand what the staff is saying to them, as well as what is happening to them. In fact, from initial diagnosis onward, Bunkerhill’s patients are thoroughly informed about every part of their care process, and asked to actively assent to it. Psychologists remind patients that they can refuse any or all parts of the care process, or any device used in the process. Their cultural and religious norms are respected and because of the diversity of the hospital’s staff, accommodation to those norms are usually made. Patients are also encouraged to talk to any member of the clinical and technical staff about their process, not just the attending physician who leads the patient’s care team, and they can ask to have those other staff members
present for any meeting. This allows contributions to diagnostic and treatment process that can be enlightening to staff, and helpful to the patient.

In Crossing the Quality Chasm the authors list ten rules that will allow medical providers to meet the goals outlined in the first major treatise on patient safety, the Institute of Medicine’s report To Err is Human. The objectives illustrated by Bunkerhill’s example are customization based on the needs of the patient, the locus of control is the patient, decision-making based on scientific and other evidence, and as a result knowledge and information flows freely and is willingly shared, staff anticipates the patient’s needs, and transparency is essential for the patient, their families and surrogates. All of this later became the concept of patient-centered care. They also fit into the “2020 Vision of Patient-Centered Primary Care” i.e., patient engagement in care, coordination of care, clinical information leading to high quality care, on-going learning and improvement of care quality, comprehensive, integrated care with free-flowing information to all teams, and on-going patient input and feedback in the process.

8.3.1 At Bunkerhill: The Practice of Particularity

The principle of particularity fits easily into the patient-centered care movement. This principle acknowledges that new kinds of people are different from normative people, and may also be different from each other. Any effective medical treatment of them will require that the specific enhancement/s each one of them has must be accounted for within and guide their treatment. Alassane’s diagnostic experience and treatment at Bunkerhill Hospital illustrates this principle, standing in stark contrast to his deficient treatment at Provident Hospital.

En route to Bunkerhill from Provident the helicopter temperature was a coolish 90°F because even though his fever was coming down, now it was 101°F, and he had been changed
into a weighted Bunkerhill gown and given a vitals monitoring wristband. He was immediately taken to a room where a full diagnostic interview was conducted with Alassane and his family. Dr. Qing, resident doctors Leval and Hart, two nurses, a tech specialist, a physician assistant and an LPN were also present. This was Alassane’s team. He was given a full body scan with a handheld MRI. His finger was pricked by a handheld pad and along with the scans, the results immediately showed up on the wall. The intersucceptions, because of where they were, did not show up in this basic scan. A very small sample of his skin, hair, nails and sweat were taken for testing, and as the results came back they were added to his electronic chart, and could be seen on the wall. During this initial process the Mariuses were told that the hospital were taking all of these samples not just to get a diagnosis for Alassane, but also to assist the clinical and technical staff in building a body of knowledge about persons who were enhanced in the way Asmara and her brother were. They asked if the family were comfortable with this, and asked Asmara if she would contribute, especially since she was healthy. The Mariuses were asked if they would like to call a spiritual advisor or have the hospital provide one. Dr. Qing explained the processes of patient care, as he, the technician and the residents left Dr. Foster, the psychologist came in and introduced herself. Alassane Marius was now a Bunkerhill patient.

Dr. Qing and his team came in and he made his introductory speech, after the family was escorted to the room reserved for Alassane. He said: “Hello Alassane I know you from your file and from the fact that you are the one in the gown. You are Mr. and Mrs. Marius. Yes? Are you Asmara his sister? Well, I’m happy to meet all of you. I’m Dr. Justin Qing your attending physician. These two are also physicians who will be working to hopefully cure you of this illness, Cynthia Leval and Dain Hart. This is Kenneth Boone the tech specialist assigned to your family and he will handle any tech specific issues that arise during your stay here. The nurses
and physician assistants will change per shift, but they will all introduce themselves and remind
you who they are when they come in. At Bunkerhill a team takes care of you. Several tests have
been ordered, and that finger prick that you got when you touched the tablet was the first one.
Your wristband is the next line of info gathering. We are all here for all of you”.

Kenneth Boone explained the purpose of the wristband, and offered Alassane’s parents
and sister their own. He took them through the wall, pointing out all its various sections, saying
what they showed, and why they were important. He also showed that they could surf the net,
and listen to music or to audiobooks on the wall. He trained them on the use of the pad to control
everything and made the Mariuses aware that if necessary he and the tech staff would often be
able to make a new device if it was required to help solve Alassane’s case. Kenneth said that
since Alassane was unique, as everyone at Bunkerhill was, his care would be unique.

Dr. Erica Foster came as everyone else was leaving. She introduced herself as “not a
social worker, but a shrink that does everything”. She said that Bunkerhill would not just strive
to heal Alassane, but would also strive to make the family’s stay as lovely and happy as possible.
She assured Alassane and Asmara that what was enhanced about them is something that they
planned to use every step of the way from diagnosis to discharge. She described their
enhancement as an asset to treatment and to the science of medicine. She made it a point to say
that the team and the Mariuses were beginning a relationship, and every member of the team are
there to help, and any one of the family, especially Alassane should not feel any reluctance to
talk about any concerns with a team member. Here she was engaging in what is now called
relationship-centered care (RCC): respecting the personhood of the patient, understanding that
affect and emotion are important parts of this relationship, reciprocal influence is the context of
these relationships, and genuine relationships are morally desirable.
Neither Dr. Moton nor Dr. Astin bothered to talk to the staff at Bunkerhill when Armana was arranging the transfer. They both did not make themselves available when the team from Bunkerhill came to pick up Alassane. The nursing staff did send a copy of his minimally complete chart with him. Later in the day Dr. Qing came in, greeted everyone brightly and sat at his bedside, clasped his hand and gently asked Alassane all of the questions cited above, and if he was endoacoustic, and if he was aware of limbic neuropathic resonance within himself. Armana took note particularly of the last two questions Dr. Qing asked her brother. She took out her interface, spoke in “endoacoustic” and “limbic neuropathic resonance”. She learned that they were new terms that were coined to described abilities some transhumans like she and her brother possessed. In this case it was the ability to do an internal examination of themselves and actually tell what was different within every anatomical system they have. There also was now a name for their ability to sense internal feelings psychological, emotional and physical far more acutely than normative persons. In other words, for example they could tell when the lymph nodes were secreting more fluid than usual into venous circulation. They can also tell what has come into their bodies from the outside quite easily, i.e. they instinctively know that they are infected and/or affected almost instantly, long before any infection manifests.

Alassane’s color was becoming matte purple when he arrived; he was cold and complaining of abdominal pain. Dr. Qing ordered a full blood panel, and was told that the phlebotomist had already taken samples to the lab, on the tray the doctor could see that his patient’s white blood cell count was well below 7000; for persons like the Marius siblings a leukocyte load of 14,000 to 19,000 per microliter of blood is normal. For normative persons the numbers are 4,000 to 11,000 per microliter.\textsuperscript{647} Before the family left Provident Dr. Moton had also ordered Symmetrel for influenza A after the Tamaflu had cleared his system.\textsuperscript{648} While Dr.
Qing was interacting with Alassane nurses were asking the questions necessary to getting a full medical and social picture of him from his parents and sister.

Dr. Qing asked again. “Alassane are you endoacoustic and do you have the ability to use limbic neuropathic resonance”. Alassane looked a bit confused. Dr. Qing said, “Just tell me what you see, hear, and feel inside. Tell me where and what the trouble is … everything. Just listen in. Where is there too much going on? Has anything turned off? Don’t think about what you ought to say because you’re not like regular people. Really tell me what’s going on. Show me.”

Armana took her brother’s other hand, connecting with him, and he began an intricate and exacting endoacoustic, limbic neuropathic explication of his illness. Alassane sighed slowly, blinked his eyes almost as slowly and went completely still. His doctor was calm and his sister was curious.

At the end Dr. Qing picked up the a more exacting tablet he had brought with him and moved it over his patient’s thoracic and abdominal regions, like an ultrasound. The picture was swiped onto “the Wall”. The doctor also led Alassane through a process by which he could nearly silence his abdominal nerves and increase his endorphin levels, and he was put on a regimen to clean his digestive tract and the next mid-morning he had a CT scan. It was clear Alassane had an intussusception, part of the small intestine had telescoped into part of the large intestine. He was treated and in two weeks he was discharged. His discharge was delayed because of the time lost with the initial misdiagnosis of influenza and the time needed to correct the treatments he was given as a result of that misdiagnosis. The ibuprofen did nothing but increase his pain and cloud his thinking. The Tamiflu destroyed his leukocytes and opened him up to a minor bacterial infection that caused his skin to become dry, scaly and purple. It also caused his body temperature to drop precipitously and then spike, inhibited his respiration and
was ultimately rejected by his digestive system. He was treated with a very low dose of a specific antibiotic for the nosocomial infection, and sent home with a low dose general antibiotic as a precaution. A physician’s assistant called Alassane every day after his release to check on him, and he was asked to continue to wear his wristband until his doctor said he could cease doing so. Usual recovery time once at home for children is a month. Alassane recovered fully in a week.

There were articles written about various forms of enhancement in all kinds of medical, scientific and technological journals. Dr. Qing had read the majority of these articles both because he was a nerd and eager to learn as much as he could about transhumans, and because he worked at the cutting edge Bunkerhill hospital. He had read about the particular genetic enhancements the Marius siblings had received, and that is where he had heard the terms endoacoustic and limbic neuropathic resonance. Neither of these attributes were present in more than .0072% of normative persons. There are various medical specialties and people with different illnesses. There are also different kinds of normative people. Transhumans are different kinds of persons but they are not normative people. I maintain that Beauchamp and Childress’ principles of beneficence and nonmaleficence, which I think should be combined into one principle for the purpose of this dissertation, falls short in that it is a principle applied to normative people, and without specific modification does not account for the existence of transhumans.

The experience of Alassane and his family at Bunkerhill Hospital illustrates the tenets of the implementation of particularity. Dr. Qing educated himself on enhancement and enhanced persons. He ascertained the patient’s actual enhancement. He used that knowledge to proceed with his patient’s diagnosis and treatment. Because Dr. Qing kept himself abreast of the latest innovations in medicine and medical technology, and especially enhanced persons when
Alassane and his sister came to Bunkerhill he was ready. This is the fifth principle of medical ethics according to the American Medical Association. “A physician shall continue to study, apply and advance scientific knowledge, maintain a commitment to medical education, make relevant information to patients, colleagues and the public, obtain consultation and use the talents of other health professionals when indicated.”

Because he found out just how Alassane was enhanced and used that information in his treatment of him he was able to render due care. In doing so he was acting appropriately so as not to harm Alassane. His patient’s enhancement was organically fundamental to who he was physically, psycho-emotionally, intellectually and socially. This is crucial information. There could not have been an accurate diagnosis or any appropriate treatment if Dr. Qing did not have this knowledge. The endoacoustic and limbic neuropathic questions came directly from this knowledge and, as noted above, it was the doctor working with his patient that led to the intersuccion being suspected and ultimately found. Put more succinctly, Alassane’s enhancement allowed the team to narrow down what was causing his symptoms more quickly than they might otherwise have done. He was the locus of the process from the beginning, and was able to contribute significantly to his care, indeed he, or rather his enhancement, was essential to it. Bunkerhill Hospital’s modus operandi made it the perfect place for this patient-centered model. Unlike Provident Hospital where Dr. Moton had heard of transhumans, Bunkerhill Hospital had clinical staff that were educated about them and ready to work with them.

Bunkerhill’s method of treating patients exemplifies the standard that Neeraj Arora who had been a cancer patient in 1994 wrote about in “Importance of Patient-Centered Care in Enhancing Patient Well-Being: A Cancer Survivor’s Perspective”. In his article for Quality of
Life Research, Arora writes that the treatment of patients should be wholistic and compassionate, not just the delivery of that which is only cure-focused. The emphasis should be the care in the term medical care. High technology cannot treat the whole person: people and their humanity are needed. The care at Bunkerhill also met the tenets espoused by the Picker Institute: (1) respect for the patient’s values, needs and preferences, (2) including the patient’s friends and family, (3) the coordination and integration of care, (4) readily communicating information and educating the patient and their circle, (5) underpinning the patient and their circle emotionally, tackling anxieties and fears, (6) prompt access to care and advice, (7) effective treatment by clinical staff, and (8) being attentive to the comfort of the patient and their circle. Bunkerhill staff always consulted Alassane and his family during his stay, and Armana was asked if she would like to donate tissue to assist in helping the staff become better at treating enhanced humans, thus meeting tenets 1 and 2. Because everything about Alassane’s case could be projected onto the Wall, and the staff would readily give information tenet 4 was met. Dr. Foster was available for psycho-emotional support and other members of the Mariuses’ team were also trained to be emotional support for the patients and their families, thus meeting tenet 5. The Mariuses had a team at Bunkerhill consisting of clinical and technological staff, as well as support staff who saw to their non-medical comfort, fulfilling tenets 8 and 3. The Bunkerhill clinical and technological staff was recruited from around the world, and are among the best in their fields. Before they were hired they had to have a record of peak effectiveness in what they did, and demonstrate a person-centered orientation, and to retain their position at Bunkerhill their effectiveness and orientation had to be maintained. In that tenet 7 is fulfilled. Alassane was constantly monitored by the wristband and care would have come to him at anytime it was warranted, thus tenet 6 would be fulfilled.
Vulnerable people have to be seen as individual people, that is to say unique in their personhood. This is especially true for transhumans. Recalling ten Have’s three dimensions of vulnerability transhumans as a group and in individual cases, depending on what their enhancement is can be said to be vulnerable. Their vulnerability enters the second dimension because it can be of one or more types. Exposure to an outside factor and/or something intrinsic to the transhuman can be an example of the third dimension. Bunkerhill hospital attacked these dimensions in their staff’s care of Alassane. His illness and their assessing his enhancement allowed them to address the first dimension of vulnerability. Their taking into account the psychological, religious and physical needs of Alassane and his family addressed the second dimension. Finally, the exposure to illness and prejudice by the staff at Provident Hospital, which is the third dimension was appropriately and effectively addressed by the team at Bunkerhill.

**Conclusion**

In the principle of particularity the central concept is that the enhanced person must be treated in a manner that is consistently informed by their enhancement. The ailment may manifest as it would in a normative person, still the enhancement must be taken into account during diagnosis, and must figure in treatment and therapy, because they are integral to the patient and therefore diagnosis and treatment is only properly done when the enhancement is integral to the diagnosis and subsequent treatment. Patient-centered care is the most beneficent. Doing all that is best for the patient is at the center of the operating philosophy. The clinical and nonclinical staff are not centered on their own advancement or enrichment. Their focus is on the patient. Because transhumans have distinctive enhancements patient-centered care is paramount. The staff at Provident Hospital was not patient-centered when it came to Alassane. They
assumed normativity rather than try to understand his enhancement. They made baseless
assumptions, rather than adequately interviewing their patient. The resident accepted one of these
errant assumptions, and chose to let the patient suffer, rather than treat his pain. Neither he nor
the attending physician incorporated Alassane’s enhancement into his diagnosis or treatment.
This seeming lack of interest in Alassane the whole person was a prime example of maleficence.
Not understanding Alassane’s enhancement and the things about his physiology that make him
different from normative persons could have led to complications, or death. It did lead to an
adverse reaction when he was given Tamiflu.

Bunkerhill was the opposite. From making sure to keep Alassane cool on the helicopter
ride from Provident to the wristbands and the Wall, from the patient teams to Dr. Qing’s having
done a lot to learn about transhumans to treat them, and knowing about endoacousticality and
limbic neuropathic resonance, they operated in a manner to which patient-centered care is the
only kind of care practiced there. All of the Mariuses were included in the knowledge stream.
The comfort of the patient and his family was important to the team. A psychiatrist was available
for psycho-emotional support, but the staff offered to have a spiritual advisor come in also. The
staff also conferred with Alassane about all of his diagnosis and treatment, and his wishes were
respected. The clinical staff used all the tools at their disposal, including their patient’s
enhancement, so that they quickly understood what was needed to ascertain what the problem
was and to address it. In the end Alassane was successfully treated and released.
THE PRINCIPLE OF INTRINSIC PERSONHOOD

Introduction

In his book The Synthetic Age: Outdesigning Evolution, Resurrecting Species, and Engineering Our World Christopher J. Preston writes, “Whoever you are – a scientist or painter, a farmer or philosopher, a young mother or wrinkled grandparent – radical shift in how you look at the world typically begins with a single moment of awakening. In one instant, something happens that crystallizes a whole set of thoughts and observations into a shocking new realization... At other times, humanity will strike out on a different path, determined to remake the world in a way that improves on what nature had provided.”657 Enlightenment and paradigm shift are what Preston is writing about, and in the world into which this dissertation is projected enough enhanced, post or transhumans exist so that both of these fundamental realizations must happen. The obvious necessary shift had to come in medicine that these persons were not like other people and, according to the principle of particularity, treating these new persons in direct conjunction with their particular enhancement is an ethical must. Failure to do so is malpractice and this maleficence can lead to the death of the patient. While this is enlightenment, paradigm shift is also a necessity and this chapter will tackle that shift. The shift requires that these new beings be included in the family of persons. This shift is the second principle that I see as vital for the ethical treatment of transhuman patients, and that is intrinsic personhood. Simply stated the principle of intrinsic personhood requires that post or transhumans, because they are mainly enhanced members of the species homo sapiens sapiens, they should be given the same level of due care and consideration that normative persons are given.
This inclusion cannot be nominal, and their (enhanced persons) differences must not be peculiarized. The object is to make these persons as human as possible, when it comes to medical treatment and scientific experimentation, so as to effectuate their being able to be treated with the beneficence and nonmaleficence that is due to everyone who presents him/herself in these situations. Othering, as seen in the treatment of various racial, religious, ethnic, sexuality and enablement groups is dangerous. Here I am referencing examples like the Tuskegee Syphilis Study, Nazi experiments on Jews and other vulnerable groups, and the experiments of Japanese scientists on other Asian nationals and prisoners of war during the World War 2 period. Whenever someone experiences the acute vulnerability of illness and hospitalization it can be deadly. It is the contention of this author that ethics grows more and more these days out of the rubric of human rights because it is most often types or groups of people who are mistreated or othered. Unless the enhanced are not maltreated then an injustice is occurring.

Beauchamp and Childress’ principle of justice is applicable here, from the perspective of human rights, in a political or nation state citizens should have the same rights material and utilitarian. Further, just because these persons are different they should not be excluded from ‘fair opportunity’ in medical consideration and treatment, i.e. they should not be subject to discrimination.

Alassane’s case and family brings to the fore the great and obvious difference of enhanced persons to normative people. A diagnosis of sorts was made by the admitting nurse at the first hospital of drunkenness. A doctor agreed with this and took no action at first. An attending physician came onto the case and assumed (diagnosed) influenza before testing was done. All of this was maleficence borne of prejudice and arrogance. This chapter will examine where these assumptions came from and whether they fit into legitimate objection by healthcare
staff, as well as how they are the same sort of societal wrongs that greeted other persons that are/were seen as different or inferior. It will also, using the same case, show why a principle of intrinsic personhood is necessary, even though an overriding principle of justice has been set particularly in the Western world. Just saying what is right is sometimes not enough. What is right needs to be explained and particularized so that there can be no wiggle-room or confusion. Sometimes people, even in settings where doing the right thing is the main purpose, cannot be depended upon to follow the course of justice.

9.1 Vulnerability, Justice and Intrinsic Personhood

Alassane Marius and his sister Armana are obviously non-normative (fitting into the family of human beings that are not fundamentally enhanced, of the species homo sapiens sapiens), and often in the mid 2000s people react in a myriad of ways when they encounter them. That is not to say that they always react negatively, not at all; children tend to be fascinated by them. Above I referenced Beauchamp and Childress’ definition of justice, that in a political or nation state citizens should have the same rights which is material and justice is utilitarian, further those citizens must not be excluded from “fair opportunity”. Albert Jonsen, et. al. expressed the definition in a way that they took to be more appropriate for healthcare. Justice is the term encompassing the social theory and moral regimes that attempt to underpin the fair and equitable distribution of the social system’s benefits and responsibilities. The participants in the system must through various transactions and relationships get what they deserve and can reasonably expect. Aristotle, in the Ethica Nichmachaes, positions the level playing field or fair opportunity in his concept of equity, noting that though equity is not just a matter of law, his argument is that equity is needed when the law is universally applied and is found lacking.
Tweaking the law to fit every sort of nuance is inefficient and will not suffice, therefore equity is needed to fill the gaps.662

What follows are the two models of deciding personhood that I have chosen. The first is neuroethics in which a series of scientific and psychological studies are used to point to the conclusion that the human brain is hardwired to recognize a person when the human subject sees one. The second model comes from the field of personalism. In this model a person is a person both in and of her/himself, and also a person in relation to other persons, the total environment in which they fit, and to their God. Therefore, we have a model of personhood that is neurological and one that is relational (sociological), which was created by a theologian, and my position is that both are needed when assessing who is a person. A strict adherence to the neurological assessment of personhood would not necessarily cause one to deal justly with another person. This model is too academic, and it points out that non-human entities can be recognized as persons. As long as the morphology is similar enough then the entity can be a person. Clinical staff may not give due care to the enhanced person if they are too different, even if their morphology fits the personhood mode. Therefore, another model is called for, something more sociological. Personalism fits the bill because it situates personhood not only within the body of the being, but also in relation to other persons both collectively and individually. A person comes with life experiences which they can relate. They come with feelings and preferences, not just morphology. In essence they come with social connection. The neurological system will recognize physical personhood, but it does not tell us how to deal with that person, as personalism attempts to do. Thus, the neurological and sociological combined gives us the best assessment of personhood.
9.1.1 Personhood and Neuroethics

Alassane and his sister are so different that they cannot go unnoticed unless they are in a group comprised solely of other transhumans, but because they are made largely of the same building blocks of normative people who are considered persons they should also be considered persons. Just as it is necessary to define justice it is necessary to set the parameters of personhood for this treatise. Martha Farah and Andrea Heberlein, in their reading in Neuroethics: An introduction with Readings, root the perception of personhood in neuroscience. They do not see personhood as a “real category of objects in the world”, rather personhood is a concept that innately evolves in the physiological systems in the brain and automatically and determinedly projects itself out into the world. They begin with the explanation that the fusiform gyrus is the system geared to face recognition, even when the face is obscured. When a body, as a silhouette, even as a stick figure without a perceptible face is presented both the fusiform gyrus and the temporoparietal juncture on the lateral surface of the brain are activated. They also point to a study by Fletcher et al, proving that perceiving mental states is done in the medial prefrontal cortex, specifically two kinds of stories, one where physical causation had to be shown rather than a psychological one, and the other in which one’s mental state had to be shown in order to make the story comprehensible. In studies involving games played against a computer, and a person (Farah and Heberlein’s word) using another computer the medial prefrontal cortex was most active when considering persons.

Farah and Heberlien call this system in the brain the person network. According to them this network has both automaticity and innateness. The person network is automatic in that it is activated by specific stimuli even when the individual knows the stimulus is not a person. The network is innate in that it is hardwired into the individual, and not a learned system. They note
that in an experiment, published in 1995 even a prosopagnosic patient could recognize faces when the faces were turned upside down. Automaticity was at work because facial recognition could not be turned off, indeed a person’s face could not be seen as anything else.\textsuperscript{667}

Citing Downing et. al., Farah and Heberlein write that even when an individual is not paying attention to them or is unaware of them faces and bodies can trigger the person network.\textsuperscript{668} The last point under automaticity that the authors make comes from a 2004 study by Heberlein and Adolphs, about the 1994 film by Heider and Simmel.\textsuperscript{669} Behavior that results when a stimulus is responsive to its environment is called contingent, and can evoke a sense of intentionality and personhood.

In their argument for innateness Farah and Hederlein point to studies in babies. Two will be cited here. The first comes from 1998. Five-month-old infants were tested by A. Woodward. They were shown two representations. One was a person reaching around a barrier to get an object, and the second was the same motion with a mechanical arm replacing the human one. The barrier was removed and the same motion was repeated. Also, direct reaching was done by both the human and machine. Babies were surprised when the mechanical arm reached directly, but they looked longer when the human arm moved in and then reached in a round about motion. Direct retrieval in the human arm was expected, but it was not in the mechanical arm, and vice versa. This expectation of intentional behavior in people activated the person network.\textsuperscript{670} The second study, by Kulhmeier, et. al., dealt with traversing a continuous trajectory. At a similar age as the infants above babies understand some principles of how physical objects behave, like needing to traverse a continuous trajectory in space from one point to another. However, they do think that people are exempt from some of the constraints to which other objects are subject.
People do in reality move across continuous space in a trajectory. This is innate, and its perception is innate.\textsuperscript{671}

From here Farah and Hederlein give three what they call relevant features of the person network. The first is that it is a separate system from the ones that represent other things. The second relevant feature is its automaticity; its becomes activated by specific stimuli such as faces and contingent behavior, and it does not matter if the individual believes that a person is actually there. The last feature is that the person network is innate, an early adaptation to a world before this one where there was not as much ambiguity (e.g. cartoons, stick figures, furbies, etc).\textsuperscript{672}

Transhumans move across spaces in particular trajectories, and have discernable faces and the morphology that allow them to be seen as human by the brain. They can reach in a roundabout motion as well as in a straight-forward manner. They respond to their environment, i.e. when they are cold they put on more clothing, when they sense hostility they prepare to fight or flee. Therefore, a transhuman person would of course automatically trigger this network, and thus will innately be recognized as a person, in the person network of normative and enhanced persons. All of this is because the transhuman is simply an enhanced member of the species homo sapiens sapiens. This network, and its workings as cited above shows that there is a physical recognition of the person, however, a fuller argument for what constitutes a person must take other things into account and for this treatise the main other thing will be personhood in relation to other people.

9.1.2 Personhood is in Relation to Others

Another argument for defining personhood is that it exists in relation to others. Louis Janssens has given an eight-point chart for what constitutes the dimensions of what he refers to as a
human person. They are: (1) A person is a subject, not an object because they can exercise free will. (2) A person has a body, or is a subject in corporeality. (3) Because of this body a person is a being in the world. (4) Persons are directed toward one another. (5) Persons are social creatures living within communities and structures. (6) Persons are historical beings; they remember things experiences, etc. (7) Persons are unique, original, but they are also equal. (8) Persons are fundamentally oriented toward God. If we are to ascertain whether an action is moral, we must consider its effect upon others, and its grounding within the actor.

Joseph Selling rejiggers Janssen's dimensions of the person so that persons being directed toward others and are social are moved to the top spots. To him the core of the argument is that being a person is relational, i.e. in relation to others. Selling writes that the “human person stands in relation to everything, to the whole of reality, to the material world, and to (groups of) other persons”. The person is always a person-in-relation, and the core meaning of personhood is the relationship to the totality of reality, because it engages every facet of our experience. It engages the person socially, spiritually, intellectually, and physically.

Selling goes on to point out that the self does not formulate in a vacuum. It forms culturally and historically in relation to other selves, indeed the larger world and what he calls the transcendent. It is just this concept of relatedness that the case of Alassane highlights. In form he and his sister look enough like normative humans to trigger the personhood network in the brain; the question is whether the hospital staff, particularly at Provident Hospital, sees a person when they see him and his sibling, and whether they give due care to him and his family.

The simple explanation of intrinsic personhood that I am positing is that the principle of intrinsic personhood requires that within the family of beings that homo sapiens sapiens consider persons, transhumans must be considered human persons because post or transhumans are mainly
enhanced members of that species. Also, they should be given the same level of due care and consideration that normative homo sapiens sapiens persons are given. Alassane and his sister are recognizable to the person network, and they can also ground their personhood in personalism, as Selling states it, relation to other persons, their community be it other transhumans or other sorts of groups, the reality of the world and the environment.

Janssens’ theory, foundational to personalism is more indepth. On being a subject rather than an object, his first attribute, Alassane and his sister both exercise free will and function in society. Armana is an attorney and her brother is an economist so they participate in a normative way in society. The fact that Alassane is a patient in hospital and his sister is there visiting, both in bodies, fulfills Janssens’ second attribute. The third attribute is met because the bodies function in the physical world. The most obvious example of this relationship is that. They conduct their daily lives interacting with other persons, both normative and transhuman, thus meeting the fourth attribute orientation to other persons. This also allows them to fulfill attribute five because Alassane and Armana are siblings, and they have normative parents. Together they form a family which is part of a larger family, and they are members of diverse communities, such as a law practice, musical club, a neighborhood, etc. It can be assumed that they have friends, and these friends may not only be other enhanced persons. They remember their experiences, and they retain information and act upon it in specific situations. This is Janssens’ sixth attribute. As far as the seventh attribute is concerned we do not know what their religious beliefs are, but we can assume that they are not a part of a religious movement against human enhancement. Like normative persons Alassane and Armana meet both Janssens’ and Sellings criteria for assessing personhood, as well as being recognizable to the person network. They also meet the criterion laid out in the stated principle of intrinsic personhood. They are genetically enhanced homo
sapiens sapiens, thus they are persons and entitled to the same level of due care and consideration that normative persons are given.

9.1.3 Vulnerability

A discussion of the issue of vulnerability is appropriate here. Transhumans are designed to have advantages over normative humans. Their sight, hearing, taste, sense of smell, IQ, internal awareness, etc may be more acute, depending on their particular enhancement. That does not, however, make them invincible. Transhumans could be considered vulnerable, even if they can reasonably expect to live to be 200 years old, and in mostly good health. People who have the visual acuity of an eagle and the night vision of an owl are strange; some can navigate their way with sonar. People who can hear at greater distances and at the lowest and highest frequencies sound almost vampiric. These people are genetically engineered. Some have been synthetically or cybernetically modified. They can feel everything and experience everything to its fullest and can eidetically recall all of their feelings. These things begin to explain why posthumans will at least at first be vulnerable. Again, they are vulnerable because they are fewer in number and will be for generations. They are vulnerable because they are subject to external forces, most powerfully governments, who will make decisions as to whether the technologies that are used to create them, and/or enhance humans will be allowed to continue. The definition of vulnerability used in chapter 7 is appropriate here. A group is vulnerable if it is susceptible to injury, in danger of attack or damage, or capable of emotional or physical wounding. In 2040 transhumans are a minute minority. They may be immune to some viruses and bacteria, but they are not immune from all of them. They are also not immune from human cruelty and prejudice, and are often envied and feared because they are seen as more intelligent, wiser, just, compassionate,
artistically gifted, healthier, attractive, emotionally stable, etc. than normative humans. This in
the minds of many makes them a threat.

Alassane, because he is a patient is vulnerable individually, at this specific point in time,
regardless of the fact that he may be better made than the normative human when he is not ill.
The fact that the nurses cited above assume he is intoxicated adds to his vulnerability because it
opens him to harm. He can be misdiagnosed, and he was because hearing their conversation
causd Dr. Astin to adopt their assumption and delay any testing, other than a blood test to
ascertain if he had alcohol in his system, and treatment. This is comparable to the assumption
that was found to be prevalent among doctors that African American patients do not feel pain the
way white patients do. That results in African American patients getting less pain relief than is
warranted, thus adding to their suffering. He wanted to wait and see if his patient’s pain
corrected itself. Alassane and his sister were seen by him as a subspecies of human and his
interest in them both was scientific rather than compassionate. Because of his position as a
physician Dr. Astin could have done greater harm to Alassane than either of the nurses could
have done.

9.2 Alassane’s Case at Provident

Alassane Marius goes into the Provident Hospital Los Angeles presenting with the
symptoms of an acute viral infection. There is some concern among the resident physicians that
the infection might be bacterial instead. Alassane, a development economist, is twenty-seven
years old, is rather androgynous, over six feet, eight inches tall, with curly silver hair and acutely
aquiline features.
9.2.1 Day 1

Alassane is running a fever when he arrives at the hospital and his sea-green skin is bioluminesing in waves, as are the violet rods in his emerald eyes, after he comes under the ultraviolet lights at the ED entrance. When he speaks most of the polyphony is missing from his voice, leaving a flat monotone. His normal temperature is 30°C or 86°F, however he is running a temperature of 41°C or 105.5°F. Normally his heartbeat is rather slow, about 40 bpm; on this occasion it has almost doubled to 76 bpm. When he arrived at the hospital he told the doctor in the emergency department (ED) that the symptoms started three days ago. His heartrate started speeding up, he felt uncomfortable in the lower abdomen, and his skin tended toward a yellowish hue. The next day his skin was orange when he woke up and hot, and he noticed a lot of confusion. He ate much more than is normal for him. The pain got better immediately after he ate, but within two hours it got worse, and he had multiple bowel movements. What follows is a recounting of what happened after his arrival.

Alassane, though he was extremely nauseous and in a lot of pain when he got to the emergency department, managed to call his parents and sister Armana. His parents arrived about a half hour after him, and to the clinical staff they appeared to be normal biracial (African and Asian) people, but his thirty year old sister with her burnt umber iridescent skin, jet black hair and violet eyes caused several staff members to do a double take. She is her brother’s height and the staff notices that she speaks as though she is singing. This was all too much for some of the staff. They are not used to dealing with transhumans at Provident, which is affiliated with the Evangelical Baptist Church. There are, infact, a number of staff members both clinical and non-clinical who believe that the enhancement of human beings is wrong. To them human-directed
human evolution is outside of the will of God. The Marius parents seemed like nice people but they had sinned by doing what they did to their children.

A nurse assumed from Alassane’s manner of speaking that he must be under the influence of alcohol or some drug, though neither she nor anyone else ever asked him. Beverly, a nurse, is the one who assumed that Alassane was intoxicated. Slurring their words was a tell-tale sign of being drunk, “and anyway who knows what these (if they even are) kinds of people get up to”. The fact that she jumped to a conclusion is not something that was unique in the ED that day. The clinical staff understood that he is one of the new people; that was obvious, but most of them regarded him as strange rather than different. The appearance of his sister, both how she looked and that she was there, did nothing to help their perception of him.

When the ED resident physician did the initial interview with him Alassane told the doctor about his pain but he was given no pain medication. The doctor, David Astin, suggested that they “wait a little while to see if the pain goes away on its own”, because he was predisposed to believe what the nurses were saying. Rather than treat his patient’s pain, Dr. Astin did order a blood test to ascertain whether Alassane was drunk before he came to new patient’s bedside. It would have been much easier to simply ask his patient what intoxicants were in his system.

None of the clinical staff asked Alassane about who he was, but they did ask about insurance coverage. They did not take a medical history for him or his family. They did not inquire of him as to what was normal for him physically. The pertinent questions would have been these: Mr. Marius the normal body temperature for people like me is 98.6°F, is it the same for people like you? Your skin is orange, is that your normal skin color? What is the normal texture of your skin? How often have you been sick in the past, and if you have been sick what did you have? Do these illnesses run in your family? Since Alassane was obviously a non-
normative person these kinds of questions are warranted because they will allow the clinicians to find out what his baselines are. Knowing what is normal for him would allow the staff to know where the pathology began. Baselines are already known for normative persons, but enhanced persons must be assessed on a one to one basis until enough data on the various subtypes is accumulated to have a library of baseline statistics from which to draw conclusions. This is how baselines were ascertained in the past for normative persons, since enhanced persons are also intrinsically persons the same careful accumulation of information is warranted for them. Now in 2040 all medical records are digital, but they are very technical. The nuances are missing so it is still necessary to interview the patient. Alassane may have been sick in the past but he may not have had to go to the doctor, or be hospitalized because of that sickness. He told the ED staff the things cited above, but the staff did not ask for more detail. The kinds of questions asked should have been like these: Did these symptoms start after a meal? Did they come on suddenly or gradually? Have you had these symptoms before? If they are recurring what exactly made you come into the ED this time? On a scale of one to ten what number shows your pain level, ten being the worse pain? How would you describe it… stabbing, cutting, dull and widespread or radiating? Other than the phlebotomist drawing blood the staff left him alone until his family arrived.

They returned to the duty station and went about their routines. Nurses Beverly and Sue fell into conversation. “I’m sorry”, Sue said, “but how are guys like that people? I mean seriously, I don’t see a person. He’s like half human half reptile.” They both share a laugh. “I feel the same way. He doesn’t look like he got the best of anything”; replied Beverly. “Anyway, why don’t they have hospitals for them? Beverly, doesn’t it make sense that since they created these abominations that their creators would have provided medical facilities for them?” “Sue
girl I don’t know. The first time I saw one of those people on tv I said to JJ, Lord help us. People
don’t know what not to do.” Sue shook her head. “Bev the family’s here, and what is that?”

When Alassane’s sister Armana and his parents arrived the staff became a bit more
attentive, but that was because of his normal parents, and the fact that his transhuman sister was
a famous and aggressive attorney, and the personality that goes with that profession became
evident almost immediately. Dr. Astin came back just as the Mariuses got to Alassane’s bedside.
Finally, here were two normal people to talk to. He introduced himself and let them know that he
was waiting to get the blood test results. He also said, “We’re just waiting to see what happens; it
may all just go away”. As Dr. Astin walked away Mr. and Mrs. Marius busied themselves talking
with their son and encouraging him. Armana spent about five minutes talking to her brother, and
then walked over to the nurse’ station and asked where the attending physician was. She was told
that she (the attending physician) would not be in again until 8 o’clock in the morning. Armana
thought to herself that it was good that Dr. Astin had ordered blood tests, but his attitude was
wrong. There didn’t seem to be the usual anti-transhuman prejudice, but she noticed a certain
nonchalance in his manner.

9.2.2 Day 2

At around 9 o’clock the next morning the attending physician, Dr. Lana Moton, came
into the room on the ward where Alassane had been taken. The results from the blood test were
back. Alassane was not intoxicated, but he was shaking in pain. Armana did not wait for her
parents to speak; she was livid. “Are you still suffering from the belief that persons who are
different from you don’t feel pain the same as you do, like medical students thought about black
people back in 2015”, she snapped at the doctor.679 Dr. Moton is known for her calm demeanor.
Unflappable is the word often heard in relation to her, so she calmly answered “No, and I’ve
ordered an ibuprofen drip for your brother and an x-ray of his chest; Dr. Astin is a resident and I don’t think that he has treated transhuman patients before”. Mr. and Mrs. Marius quietly smiled in the doctor’s direction, but Armana was not placated…” Doctor that’s not an acceptable excuse; frankly my brother has spent a night needlessly suffering because of the bigotry of the staff here. I even heard that the nursing staff assumed that Alassane was drunk, had they asked any of us they would have found out that my brother and I have an acute allergy to alcohol”.

The enhancements that the Marius siblings possess manifest in ways other than those that are physically obvious. Alcohol makes them violently ill, so much so that they cannot use certain cough medicines or mouthwashes. Though they cannot breathe under water both Alassane and Armana can hold their breaths for at least fifteen minutes between breaths. They can eat meat but sparingly, therefore their diet is 90% vegetarian. Their emotional intelligence is prodigious, and their limbic system seems to be attuned to fear and other feelings in the way so-called lower animals’ systems are attuned. Alassane and his sister age slowly, and that partially accounts for his androgyny. His IQ is 200 points like Armana’s, but his body is that of a tall, lanky 13 year old boy. He has not been sick at all during his life. His sister had an inexplicable fever once when she was a year old. Their parents rarely get sick, and as they near sixty years old their health is exceptional. Mr. Marius’ father suffered from digestive problems all of his adult life, ultimately dying of colon cancer. Armana and her brother’s hearing, eyesight, tactile sensitivity, taste and smell are far more developed than normative humans, and they tend to see all situations, concepts, etc. in a wholistic manner. (Dr. Astin thought that Alassane probably had the flu when he saw him. That was going around lately, but he never made any effort to actually talk with his patient. He took notes of what Alassane told him, ordered the blood test and went on to other things.) During the night Alassane’s color had become a persistent gray with a slight
greenish tint. He was coughing now, and his head was throbbing. The symptoms with which he initially presented were still present. The ibuprofen drip was not doing much to help.

Dr. Astin did consult with Dr. Moton and their conversation was along these lines. “Hey Lana, so we got one of those transhumans in. The nurses think he’s drunk, and he DOES look and sound plastered, but how can you know right?” There was a long pause before Dr. Moton asked, “Did you test”. Astin admitted that he had not ordered tests yet, and quickly related what symptoms he had bothered to glean from the patient. Dr. Moton ordered Astin to go back to Alassane and actually converse with him so that an accurate diagnosis can be arrived at. He would do it later he’d been on for 28 hours and he needed a break.

Armana got more annoyed when Dr. Moton said that all signs pointed to the flu, and that she had just ordered tests before she walked in. Armana pointed out that her brother’s belly seemed rather concave and that her brother was really complaining about pain there the most. Because of their enhancements there is a modification to their intestines and stomach, such that sucking the belly in is nearly impossible. She also asked the doctor if she was aware that she and Alassane could calm themselves so that they could guide people through their bodies, giving nearly minute detail as to what they were feeling and hearing internally. Dr. Moton listened but said that she was pretty sure her brother had a version of the flu, and was just manifesting more acutely to it. The doctor also ordered a course of Tamiflu. The tests ordered were rapid influenza diagnostic tests (RIDT) to ascertain both whether influenza was actually present and if so what strain was present, and rapid molecular assays. Dr. Moton decided that she would, if needed, use an immunofluorescence test.680

Both the RIDT and the rapid molecular assay came back inconclusive or negative, so Dr. Moton ordered an immunofluorescence test. It did not prove perfectly positive for influenza.
Alassane had, however, been given his first dose of Tamaflu and he vomited up everything in his abdomen about fifteen minutes later. Armana convinced her father to insist that the staff pay attention to Alassane’s abdominal complaints. The staff was polite with Mr. Marius, (he was a cute, nice older gentleman), but they dismissed his entreaties. An hour and a half had passed when Armana finally convinced her father that Alassane needed to go to another hospital and the next day he was a patient at Bunkerhill Hospital.

Nurses Beverley and Sue were glad to see all of the Mariuses go, especially Armana, or the velociraptor as they call her. “Bunkerhill eh, well good. Seems appropriate that weirdos go to the weirdo hospital, doesn’t it Sue?” “Yes Lord, but I’m afraid they won’t be the last ones in here. Nooo, they won’t be the last ones Nurse Beverly. You can believe that!” “Well, Trey and Rosie looked after them, so we didn’t have to.” “Thank God.” Dr. Astin had became intrigued with the Marius siblings and was not so happy to be rid of them. However, he saw Alassane and Armana as interesting specimens of their species. He knew that they were humanoid, but they were not quite human. He wanted to see how they responded to therapies, as well how particular viruses and bacteria manifested in them. They were subjects suitable for experimentation in his mind, a subspecies built on human stock. The nurses may see them as an abomination but he did not. They were new and his interest was piqued.

9.3 Intrinsic Personhood and the Issue of Conscience Applied to Alassane Marius

The issue of objection for social, philosophical and/or religious reasons often comes up in clinical settings. It is not difficult to imagine that that will be the case in the 2040s. I imagine that the main objections will come from people who have moral or religious objections to the processes by which enhanced humans are created, and some will have these sorts of objections to enhanced humans themselves. This may lead to an unwillingness to treat them. Here I should
restate the principle. The principle of intrinsic personhood requires that post or transhumans, because they are mainly enhanced members of the species homo sapiens sapiens, should be given the same level of due care and consideration that normative persons are given. This explanation of what happened at Provident will be illustrative of why this principle is needed, and how it was not practiced.

9.3.1 The Nurses

The nurses Beverly and Sue managed to avoid caring for Alassane, citing religious objection to human enhancement. The reason that they could do this so readily, even at Provident is because there were other nurses on staff who, for any number of reasons, were perfectly fine with caring for him. The argument for allowing conscientious objection is in 2020 mostly concerning process and procedures, rather than patients. In 2040, however, enough of an anti-transhuman faction will develop such that in some quarters clinical staff can object to interacting with transhumans, and not face dismissal.

As would be expected in 2006 Julian Savulescu was unequivocal: “If people are not prepared to offer legally permitted, efficient, and beneficial care to a patient because it conflicts with their values, they should not be doctors. Doctors should not offer partial medical services, or partially discharge their obligations to care for their patients”. 682 He argues further that allowing for (and I will expand to all clinicians), conscientious objection for religious and/or philosophical reasons causes inefficiency and inequality. A patient being refused service by one of these clinicians is getting less rigorous care, and when they are not well informed they are less able to assert what they are entitled to as patients. 683 A religious fundamentalist clinician may believe that once a person has reached their three score and ten years they have had their allotted time, and refuse to extend any major therapy to them, or experimental treatments. This is ageism,
and therefore is discriminatory. Savulescu recommends five points to govern conscientious objection by physicians. They are (1) medical care cannot allow interference from a physician’s conscience; (2) medical students and physicians must understand that they are obligated to give thorough legal and beneficial care; (3) if an adequate number of physicians are willing to give any care that was the subject of objection, then conscientious objection can be allowed; (4) objecting physicians must make sure that patients are aware of the care to which they are entitled and refer them to a clinician who would most likely provide it; (5) if a conscientious objecting physician compromises a patient’s care they must be disciplined. National associations representing medical clinicians adopted modified versions of these points.

The president of the American Nurses Association felt it necessary to reaffirm her organization’s stance on conscientious objection because of the formation of the Health and Human Services Department’s (HHS), new Conscience and Religious Freedom Division. That position is clear and thorough. A nurse has a duty to care for their patient. Any refusal to participate in any action or therapy for reasons of conscience is permissible only if it is not motivated by arbitrariness, bias, convenience, personal preference or prejudice. They must not withdraw if it imperils the patient, and if there is not adequate care available. They must not abandon the patient. Notification of withdrawal must be given in advance, in a timely manner and to the proper authority so that proper care can be arranged for the patient. The American Medical Association also responded negatively to HHS’ new division. Its ethical policy is similar to that of the American Nurses association, and it saw that the stated aim of this new division would not safeguard patients against the negative effects of exponentially more refusals based on religious or moral objections by clinical staff. The new division’s rule requiring healthcare providers participating in Medicare, except Part B, and Medicaid to produce policies specifically
to protect religious and moral rights of their staffs, would protect any claim of moral and religious objection and result in discrimination against vulnerable groups, e.g. LGBT, nonwhite, non-Christians, etc.⁶⁸⁶

The rule was adopted by HHS and subsequent policies put into place by Medicare and Medicaid spread to a lot of hospitals, doctor’s offices and clinics. It is within this environment that nurse Sue and Beverly felt comfortable refusing to administer care to Alassane. Sue thought Alassane and his sister Armana were half reptile and half human, and Beverly called them abominations. Neither could see that they were persons. They lacked this perception because of religiously sanctioned prejudice. They saw the Marius siblings as sinfully created creatures and robbed them of their intrinsic personhood. Surely, even though Alassane did not look normal he certainly fit into the same range as stick figures, he told a causal story, and as such he had to trigger the person network in their brains. This is automatic and innate. So neuroethically Alassane and his sister must be considered persons. The second test concerns their relationship to others. They meet at least six of Janssens’ criteria in that they are subject (self-determining) not object, have a body, are social and oriented toward others, have historicity, are original and equal to others. They certainly meet Selling’s principle, standing in relation to everything, to the whole of reality, to the material world, and to (groups of) other persons. They even fit the conditions set out by Murphy for an AI entity to be considered a person. They both have human general intelligence, attributes of consciousness and the ability to act on their own volition. Again, the conscientious objection of the nurses in the case study was just what the AMA was concerned about, the legitimizing of discrimination against vulnerable populations. The very personhood of Alassane and Armana was delegitimized by the bigoted beliefs of the nurses, therefore their objection was unethical and cannot be valid. Discrimination based on inherent immutable
characteristics is in violation of the principle of justice and regarding transhumans as only the
sum of their enhancements, rather than possessing enhancements laid upon the template of homo sapiens sapiens is unethical as it denies the intrinsic personhood of such persons.

9.3.2 Dr. Astin

I also would posit that Dr. Astin is denying the personhood the Marius siblings. He sees them as lab rats. They are subjects for experimentation as far as he is concerned. Remember that he referred to them as a subspecies, thought of them as humanoid. This is obviously different from refusal to treat a patient, this is a much milder version of what happened in Germany during the Nazi period. He is not interested in what was then called racial pathology, but like the Nazis he wants to see how those who are other than normative respond to treatment, infection, drug therapy, etc. It is essentially the same moral problem T.B. Layton railed against in the journal Lancet, 1946. He was addressing Nazi practice of vivisection on various populations, and whether data gleaned from this experimentation can ethically be used. Jews were seen as not quite human thus justifying their treatment. Persons with disabilities were experimented upon also because they were different. Dr. Astin may see himself as an ally to transhumans because he is interested, indeed intrigued by them. He wants to know everything he can about them, because they are novel. Here I will recount how this kind of information gathering happens at Bunkerhill. A very small sample of his skin, hair, nails and sweat are taken for testing, and as the results came back they are added to the patient’s electronic chart, and could be seen on the wall. The same was done with Alassane. During this initial process the Mariuses were told that the hospital were taking all of these samples not just to get a diagnosis for Alassane, but also to assist the clinical and technical staff in building a body of knowledge about persons who were enhanced in
the way Asmara and her brother were. They asked if the family were comfortable with this, and asked Asmara if she would contribute, especially since she was healthy.

Because Dr. Astin cannot just see other persons, he cannot render to them due care. There is a conflict of interest that would hinder his respect for Alassane’s autonomy. Would he engage in treatment that might not be in his patient’s best interest, and thus fall into maleficence? His lack of recognition of Alassane’s intrinsic personhood, his othering of him would be unjust, even if he thinks he is doing what he is doing to acquire information that will allow him to treat any transhuman in the future, it is unethical. There is no beneficence in that.

Both the nurses and Dr. Astin fell short of honoring the principle of intrinsic personality. The nurses thought that they were abominations in the sight of God. Because of that they refused to care for them. The principle of intrinsic personhood demands that enhanced or transhumans be given the same due care as normative persons. Enhanced persons, according to the principle, must be considered persons. They are only enhanced versions of normative people. Alassane and his sister met the neuroethical brain-based requirements and sociological requirements for personhood, and the nurses seeing them as something other than persons prevented their fair treatment of him. Dr. Astin was willing to treat Alassane but he saw him and his sister as humanoid. He saw their enhancement as something that made both Alassane and his sister specimens to be observed and studied, not as patients to be treated, as he regarded normative humans.
Conclusion

The principle of intrinsic personhood requires that transhumans are considered persons within the family of beings that homo sapiens sapiens consider persons. Because post or transhumans are mainly enhanced members of that species they should be given the same level of due care and consideration that normative homo sapiens sapiens persons are given. In this chapter the case of Alassane Marius was reexamined in light of this principle. Alassane and his sister Armana were striking examples of the new enhanced or transhumans, from height to coloring, to the sounds of their voices. Staff members at Provident Hospital personified how failure to follow this principle could manifest. Two schools of thought were used to provide the basis for our subject patient and his sister being counted among the ranks of persons. The first of these schools was neuroethics, particularly the work of Farah and Heberlein, in which they surveyed the research considering how a person is recognized by the human brain, culminating in what they call the person network. That network is innately tuned to recognize a person. It is only triggered by what must, at least morphologically, resemble a human person. This response is automatic and can only be triggered in this discrete network. Because of their morphology both Alassane and his sister trigger this network and at least as far as the humans brain is concerned they can be persons.

Farah and Heberlein give a neurological or scientific basis upon which to say who is a person. Janssens and Selling provide a more sociological basis for assigning personhood. They start from the foundation that they are writing about homo sapiens sapiens. I believe that because our subjects are enhanced homo sapiens sapiens the same attributes in their arguments apply to them. The main thrust of Janssens and Selling’s argument is that one becomes a person as a result of one’s interaction with, and membership in community with other persons. Selling adds
to this the being’s interaction with all that is in his/her environment, both human and non-human. Alassane and Armana interact with their environment as a whole. However, their primary interactions are with other people whether normative or non-normative. Since they meet these criteria sociologically they can be persons.

Any transhuman who meets these criteria is a person and thus must have that personhood respected. Of course, they will be different from their fellow persons, and thus they could be vulnerable because of their few numbers, and their enhancements, and in certain situations. Because of the advance in human rights thinking there is no justification for their difference being a legitimate reason to deny them their rights, particularly the right with which this chapter is concerned, justice. Therefore, any conscientious objection that is tolerable and/or legitimate when it comes to transhumans must be against some medical procedure, not against the transhuman his/her self. It is also illegitimate to regard transhumans as novelties so much so that their personhood is devalued. When they are reduced to their difference then it is easier to experiment on them without their consent and for nefarious reasons.
CONCLUSION

Transhumanism, posthumanism and enhanced humans, the germ of these new kinds of persons has already been planted in both the real world and the worlds of science fiction. In this the Borg Queen as the blending of the masculine locus in science and the feminine locus in nature personifies the extreme of cybernetic cyborgism. She represents what fear, and misogynistic views of women, and their ability to create can construct. Using the feminine way of inclusion, albeit involuntary, she assimilates other beings. This is conquest, but not wholesale destruction that usually comes from the male version.

Dr. Frankenstein created a new man, and in doing so one might say he stole from God, and in Orphan Black cloning opens the door to people as products. Frankenstein’s creature presaged in vitro conception and cloning. His rejection and that of others led his creature to murder and despair. A nineteen-year old young lady, from an enlightened, socially conscious, 19th century British home penned this strangely prophetic horror story. Orphan Black causes us to face cloning head-on, and consider the question of whether or not the people resulting therefrom should be patented whole or in part.

All forms of human enhancement are opportunities for humankind to grow and evolve. They are opportunities that stretch the capabilities of our species. CRISPR/Cas9, haploid stem cells and transgenic transplantation are primary examples of the technologies that already exist that can help humankind get stronger and healthier, live better and longer, and safeguard future generations from unnecessary genetic mutations, infections and disease.

This kind of innovation naturally concerns people on religious, moral, ethical, social justice and other grounds. How these benefits be distributed raise all kinds of ethical objections.
These are questions that will take a paradigm shift in morals and ethics Transhumanism, a philosophy that coalesced around proto-concepts that began in the fourteenth century, may along with these technologies, become the philosophical basis, that are the foundation of the shift. Fighting against either the philosophy or the technologies will likely prove futile.

Human enhancement will come. It is here. What will be the biopolitics surrounding the existence of posthumans when they reach a significant number? Since biopolitics is grounded today in law, ethics and politics this is the ultimate discussion that concerns the interaction between the natural human and the posthuman. They are both persons. Bostrom has argued for cognitive enhancement, and that the transhumans’ greater cognitive capacity can make for a better life for all humans and other species, because greater cognitive capacity allows for better insight, better making sense of inputs, and is a better tradeoff than limited cognitive capacity.

Savulescu went further with the concepts of tradeoffs and benefits; he fiercely argues for moral enhancement. Infact he argues that it is imperative because humankind is too set in its biases, fears, and its destructive behaviors to live peaceably with new kinds of persons. To him altruism and the sense of justice must be enhanced so that they form the basis of a morality, and ethics that will allow natural and posthumans to interact successfully.

Nick Bostrom, Director of the Future of Humanity Institute, at Oxford University wrote an essay entitled “Why I Want to be a Posthuman When I Grow Up”. He posits two theses: that some posthuman modes of living would be quite good, and that becoming posthuman could be very good for humankind. This essay treated the advances in reproductive technology that might allow both Bostrom individually, and humankind in general to become posthuman. There is no argument that the longer lifespan, better health and greater cognitive ability, available through synthetic biological research and technology, immuno-medicine, genomic-based medicine, and
the new reproductive technologies will be a net positive for Bostrom, and humankind should desire the results thereof.

Principlism’s principles of beneficence and nonmaleficence, expanded from the Belmont Report’s singular principle of beneficence, and various tenets of the Hippocratic Oath. When applied to the individual it refers to the way the patient is to be treated by clinical staff so that they will not be intentionally, or unnecessarily harmed. The principles can also have a macro application; they can indeed be global if those attempting to do so understand that in various cultures beneficence and nonmaleficence are both individualistic and communitarian.

To illustrate this point three non-Western philosophical/ethical principles were applied to the new reproductive technologies. Ahimsa, which has non-injury as its definition and implied therein is the unerring respect for life which all of the new medical technologies seek to do. Thus, they adhere to ahimsa and to the principle of nonmaleficence. Ren is a Confucian concept that involves acting in a humane manner. Doing what can be done to ensure that infertile couples can conceive children, or ensuring that parents carrying defective genes can have healthy children is practicing ren. Unique to Confucian thought, the unborn are not persons, but clinicians are still required to act humanely. Personhood comes after one is born. In Sub-Saharan Africa Ubuntu is the philosophical framework that underlies the pervasive communitarianism of the cultures found there. Under Ubuntu the reproductive technologies represent the opportunities to mitigate harms like high rates of infant mortality, and bring benefits like fertility to the fore. Thus, these technologies contribute to the common “we”. Ahimsa, ren and ubuntu reinforce Beauchamp and Childress’ beneficence and nonmaleficence principles, and the technologies presented here can be seen as the embodiment of those principles.
In general vulnerability refers to being capable of being harmed. Vulnerability can be applicable to individuals and to entire communities. It is the function of exposure to an outside instigator, an internal reaction or sensitivity to exposure, and the level of the capacity to properly respond to or adapt to the circumstances created by the vehicle of the exposure. Status in life does not shield one from any and all exposure to harms.

The United Nations addressing vulnerability in Article 8 of UNESCO’s Universal Declaration on Bioethics and Human Rights seeks to promulgate a universally applicable standard of respect for human vulnerability and personal integrity when engaging in medical and scientific experimentation and research, and technological advancement in those areas. In conjunction with Article 10’s call for equality, justice and equity the groundwork is laid for all persons vulnerable or not to be treated fairly and incorporated into the life of humankind. The universality of these declarative articles transcends cultures, nationalities, and identity groups. Beauchamp and Childress principle of justice though it does not come from UNESCO’s declaration, can also be seen as universal. The overriding argument they make is one of fairness, whether it be of opportunity or fairness of diagnosis and treatment in the case of medical care, and as subjects in scientific research.

Justice in the way of fairness must be applied to enhanced or transhumans, because in 2040, the year in which the case study of Alassane Marius is set, these sorts of persons are a small minority group. They face many biases and in some cases discrimination from normative persons, who do not have the special skills or attributes of the enhanced. Part of this is driven by an objection to human enhancement, and the progeny that results from it, but part of this comes from envy. Their small number makes them vulnerable. The argument may be made that not
every enhanced person will be as vulnerable as the other, because their particular enhancement could make them almost superhuman, but that does not negate their vulnerability of as a whole.

In the principle of particularity the central concept is that the enhanced person must be treated in a manner that is consistently informed by their enhancement. The ailment may manifest as it would in a normative person, still the enhancement must be taken into account during diagnosis, and must figure in treatment and therapy, because they are integral to the patient and therefore diagnosis and treatment is only properly done when the enhancement is integral to the diagnosis and subsequent treatment. Patient-centered care is the most beneficent e.g. the clinical staff is focused is on the patient. Patient-centered care is paramount precisely because transhumans have distinctive enhancements. The staff at Provident Hospital was not patient-centered when it came to Alassane making baseless assumptions, letting the patient suffer, and not incorporating Alassane’s enhancement into his diagnosis or treatment they were a prime example of maleficence.

Bunkerhill was the opposite. From making sure to keep Alassane cool on the helicopter ride from Provident to the wristbands and the Wall, from the patient teams to Dr. Qing ‘s having done a lot to learn about treating transhumans they operated in a manner which showed that patient-centered care is the only kind of care practiced there. The staff respected his wishes about all of his diagnosis and treatment. Using all the tools at their disposal, including their patient’s enhancement, allowed Alassane’s team to ascertain what the problem was and quickly address it. In the end Alassane was successfully treated and released.

The principle of intrinsic personhood requires that transhumans are considered persons within the family of beings that homo sapiens sapiens consider persons. Because post or transhumans are mainly enhanced members of that species they should be given the same level
of due care and consideration that normative homo sapiens sapiens persons are given. In this chapter the case of Alassane Marius was reexamined in light of this principle. Alassane and his sister Armana were striking examples of the new enhanced or transhumans, from height to coloring, to the sounds of their voices. Alassane and his sister being counted among the ranks of persons is justified through neuroethical and sociological schools of thought. The first of these schools was neuroethics, particularly the work of Farah and Heberlein, in which they surveyed the research considering how a person is recognized by the human brain, culminating in what they call the person network. That network is innately tuned to recognize a person. It is only triggered by what must, at least morphologically, resemble a human person. Their morphology causes both Alassane and his sister to trigger this network, therefore as far as the human brain is concerned they can be persons.

Farah and Heberlein give a neurological or scientific basis upon which to say who is a person. Janssens and Selling provide a more sociological basis for assigning personhood. They start from the foundation that they are writing about homo sapiens sapiens. The same attributes in Janssens’ and Selling’s arguments apply to transhumans. One’s interaction with, and membership in community with other persons is the main point of their argument. According to Selling the person’s interaction is with all that is in his/her environment, both human and non-human. Alassane and Armana interact primarily with other persons both normative and transhuman, and with their environment as a whole, thus they are persons.

Any transhuman who meets these criteria is a person and thus must have that personhood respected. Because of the advance in human rights thinking there is no justification for their difference being a legitimate reason to deny them their rights, particularly the right to beneficence, nonmaleficence and justice. Therefore, the only acceptable conscientious objection
that is tolerable and/or legitimate when it comes to transhumans must be against some medical
procedure, not against the transhuman his/herself. They must not be seen as novelties so much so
that their personhood is devalued, because when they are reduced to their difference then it is
easier to experiment on them without their consent and for nefarious reasons.

Designed progeny are no less persons, and as in the scenario given, taken to the fullest
extent of the technology, designed progeny have a place in the community of genus homo. They
are ontological individuals who came into being because they could, as a result of the
advancement of science and technology. These individuals’ personhood, like the personhood of
sociological group demands respect. Rather than being the result of an attempt to kill God,
transhumanists would argue that they are the result of the use of the intellect and capabilities that
they were given by God. Transhumans are in a sense, another way of practicing the Hindu
principle of obligation, assuring the continuation of the human genus by causing a branching
evolution. Medical clinicians and scientific researchers must understand that this new branch of
persons will be different, and they have a responsibility to learn everything they can about them
so that they can be properly cared for. Finally, because with the evolution of genetic design of
progeny, the resulting person may manifest physically and/or intellectually very differently from
normative homo sapiens, clinicians must treat this different kind of person as is especially
required, but be careful to treat them as one would the ordinary person.
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