# *The* JOURNAL *of* PERSONAL CYBERCONSCIOUSNESS

Terasem Movement, Inc.

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This inaugural issue of The Journal of Personal Cyberconsciousness contains four articles by experts in the fields of law, biology, and business.




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The JOURNAL of PERSONAL CYBERCONSCIOUSNESS

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# Forms of Transhuman Persons and the Importance of Prior Resolution of Relevant Law

**Martine Rothblatt, J.D., Ph.D.**

*This article was adapted from a lecture given by Martine Rothblatt, J.D., Ph.D., founder of Terasem Movement, Inc., at the 1st Annual Colloquium on the Law of Transhuman Persons, December 10, 2005, at the Space Coast Office of Terasem Movement, Inc., Melbourne Beach, Florida.*

***Editor's Note:*** *Rothblatt poignantly explores definitions and issues relating to transhumans; not entirely dependant upon DNA, but also thought and attitude. Inspired by the ongoing Colloquia on the Law of Outer Space, which began in 1958, Rothblatt discusses the need for a communion of technological and legal experts to address issues of transhumansim and draft treaties and laws that can guide the field. She acknowledges that the results must be flexible in order to deal with the evolution and diversities inherent in life, death, artificial intelligence and immortality.*

What exactly is a transhuman? In fact, there are many definitions of transhuman. I've included a few in the following list, including that of the Extropy Institute, which is considered the founder of the transhumanist movement:

- Webster's Dictionary: "superhuman"
- Wikipedia (& WTA): an "intermediate form between human and post-human"
- Extropy Institute: a "human seeking to become post-human"
- Terasem Movement: Transbiologically receptive and noetically synthetic human

In the Terasem Movement's definition above, "noetically synthetic" implies the intrinsic and or extrinsic use of electronics for thought. The Terasem Movement also believes that the word "human" depends on thoughts, not DNA.

Amidst this wide variety of definitions is the common theme that a transhuman is something other than what we have considered, for several millenia, to be a typical biological human. A transhuman is something beyond that.

If you examine these definitions, you will notice that their emphasis varies. Some of them concentrate on the form of the entity, while others focus on the entity's attitudes. This is an interesting way to explore the scope that's provided by the term transhuman and the ambiguity – *the constructive ambiguity* - that is contained within that term.

For example, definitions that categorize transhuman as superhuman tend to be more about the form of the transhuman. They envision a post-human, something that has a tremendously different body and fantastically greater powers or a different mind.

On the other hand, definitions of transhuman that resemble the Terasem Movement's example emphasize the receptivity of the individual to transbiological unity. These are more about attitude. Within this scope, anyone and everyone could themselves say, "I, too, am a transhuman". This is because the ability to be a transhuman depends on whether you are receptive to being transbiological.

Image 1 parses the definitions of transhuman on a scale of form versus attitude.

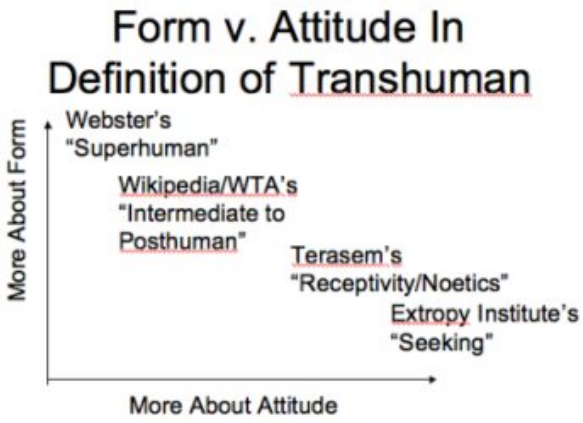


*Image 1*

There are many opportunities to challenge even this span of definitions. How are brain-enhanced nonhuman animals considered within the definitions? What about Kamira or sideways evolution?[1] This is a very interesting topic to explore.

Since the time of Darwin's contemporaries, many people have assumed that evolution always went in an upward path of increasing complexity. This idea persists even though Darwin himself was not of that assumption. Most evolutionary biologists emphasize that evolution occurs as much sideways as anything else. So when we consider other versions of humans that may not be more advanced intellectually or physically, would they also be transhuman? What about artificial intelligence that is not patterned on human thoughts? Peter Voss explores Artificial General Intelligence and how it may not be patterned on human thoughts in his article, "AGI" in this issue.

*"... 'transhuman' is an evolving term, which is actually a good thing."*

These exceptions illustrate that the term "transhuman" is an evolving term, which is actually a good thing. It ties in with the theme of this article, which is a comparison between the law of outer space and the law of transhuman persons, because outer space itself has never been a well-defined concept. Outer space has been a continuously evolving concept.

When we talk about the Law of Transhuman Persons, that gives rise to some questions about how we define persons. The United States Code defines a person as a human or organization with legal rights and duties. This gives rise to several questions, such as the following: Are transhumanized US citizens still citizens? If there is no renunciation or death, are you still a citizen even if you have chosen bit by bit to replace yourself, or to just change your attitudes and become transhumanized as an individual physically or attitudinally? What about a revived person? How about somebody who has experienced legal death, even perhaps heart death, but not information-theory death? In other words, their brain is vitrified or cryonicized as within an organization such as ALCOR, and subsequently becomes revived, and is then living, autonomous and conscious. Is that individual a citizen or not? We also need to ask whether non-citizens can be organized as a trust or other business entity.

The Terasem Movement decided to organize the Colloquia on the Law of Transhuman Persons because we were inspired by the ongoing Colloquia on the Law of Outer Space. In 1958, a group of about thirty technologists and lawyers gathered together to hold the first Colloquia on the Law of Outer Space. This happened at the very dawning of the space age. This was the era of the Khrushchev-Nixon kitchen debates over such seeming trivialities as which political and economic system would produce a better washing machine. It was the time of forced desegregation in Little Rock and the first

launches of the US and Soviet satellites. Image 2 depicts this era.

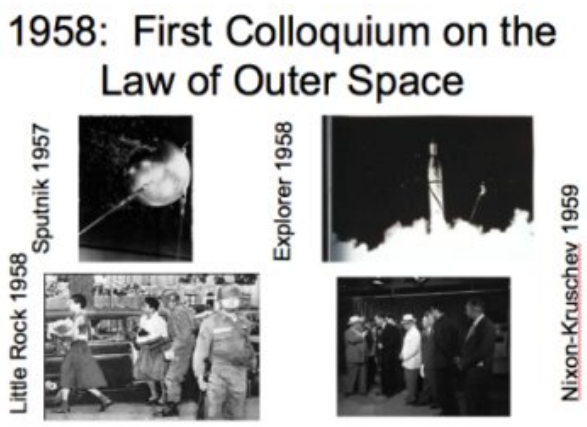


*Image 2*

I feel that we are at about that same point right now with regard to transhuman technology and that we can be inspired by that first Colloquia on the Law of Outer Space. Just as we are doing now, they began by bringing together technical and legal experts to start the field. I want to emphasize that it was a combination of the two, working hand-in-hand, in order to hash out a rational result in the field of technology law.

If anyone asks whether we are starting too early to think about transhuman law, I refer them to the environment in which the first Colloquia on the Law of Outer Space met.[2]

At that time, no animal had even been to orbit. It was just twelve years after Arthur C. Clarke had published his first article proposing that a satellite in geostationary orbit would be able to broadcast continuously over a portion of the earth's service. No one had ever thought of that before. He was the first to publish the idea of a wireless world. In his article, he included a picture of a little person inside the satellite, because they could not yet conceive that electronics technology would be sophisticated enough to handle the switching of calls in an unmanned communication satellite.

*"... one would be hard-pressed to say that we are starting too soon with a Colloquia on the Law of Transhuman Persons."*

The colloquia met twenty years before any spacecraft had caused any earthly damage (the first space object to crash to earth occurred in 1978), so it met well before any real legal issue arose from occupying outer space. Similarly, it may be twenty years into the future before the first artificial intelligence agent causes damage. Nonetheless, one would be hard-pressed to say that we are starting too soon with a Colloquia on the Law of Transhuman Persons.

Image 3 shows a comparison of where we were with outer space technology and where we are with transhuman technology. In each category, we are at comparable point today in transhuman technology to where outer space technology was in 1958.

## When Legal Efforts Began

| Space: 1958<br>Transhuman: 2005 | Outer Space Technology | Transhuman Technology |
|---|---|---|
| Practicality & Utility | Scientific & Military | Scientific, Medical & Military |
| Motivation for Law | Avoid Conflict Among States | Avoid Conflict Among Beings |
| Hardest Issue | Boundaries in Space | Boundaries in Citizenship |
| Action Plan | Transcend Air Law Concepts | Transcend Law of Persons Concepts? |

*Image 3*

Raymond Kurzweil provided the analysis for Image 4. In it, he shows that we are within twenty years from the point in time when computers will have human-level intelligence.

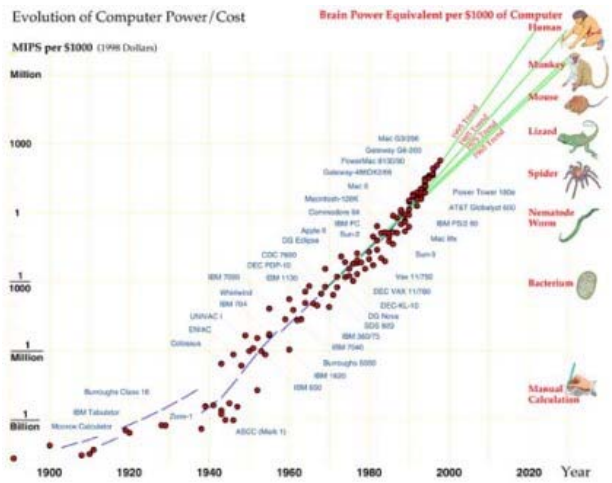


*Image 4*

Image 5 is also by Kurzweil and makes the same point; that is, because of the accelerating rate of technology in general, miniaturization in size, speed of processing, and advances in medical technology, we will have even some of the more aggressive concepts of transhuman technology - such as transhuman persons walking around, curious about things - within twenty years.

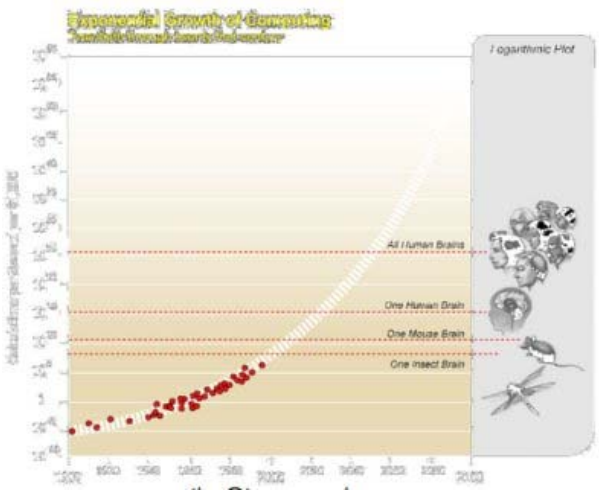


*Image 5*

What did the experts conclude about space law in 1958? First, they came to the conclusion that the age-old concept of national sovereignty over air space had to give way to the technological reality of orbital over-flight. Up until the time of the space age, it was thought that a country's sovereignty went from the core of the earth in a cone out to the cosmos. You did not have the right to fly a balloon or a plane over another country's space without their permission. Yet when Sputnik orbited the world, the Russians didn't ask for anybody's permission. Thus it became clear that it would be ludicrous to ask for permission for orbital over-flight. Technological advancement therefore abolished a fundamental principal of international law and national sovereignty.

The colloquia also concluded that a designated entity had to be legally responsible for every object launched into outer space. They realized that these objects could cause damage and if nobody was responsible and there was no rule of law, conflict and possibly even war might result.

So how do they fare? Image 6 contains pictures of two of the founding members of the Colloquia on the Law of Outer Space - Andrew Haley from Washington D.C. and Stephen Gorove from the University of Mississippi.


*Image 6*

Nine years after they began, they had an international treaty that banned sovereignty over space. Six years later, an international treaty on liability caused by space objects was adopted worldwide. These treaties were based on the findings and developments that came out of each yearly meeting of the colloquia. Each year, the colloquia would develop and draft treaties, and papers would be presented on the pros and cons of different propositions. Last year, in 2005, the Colloquia on the Law of Outer Space held its 47th meeting. It has never missed a year since 1958.

Thus, the Colloquia on the Law of Outer Space is certainly a great role model for those of us working on the Law of Transhuman Persons. What might we conclude analogous to our legal forbearers? Perhaps transhumanist technology renders age-old concepts of citizenship and death as obsolete as the age-old legal concept of national sovereignty. We will have to come up with new concepts to transcend death or citizenship because of our own "Sputnik-izing" of technology in our own time. And perhaps we will agree that responsibility for transhuman persons needs to be regularized in some fashion so that newly created individuals have a train of responsibility whether to themselves or the non-transhuman people who created them.

A possible analytic framework for a transhuman person law is laid out in Image 7.

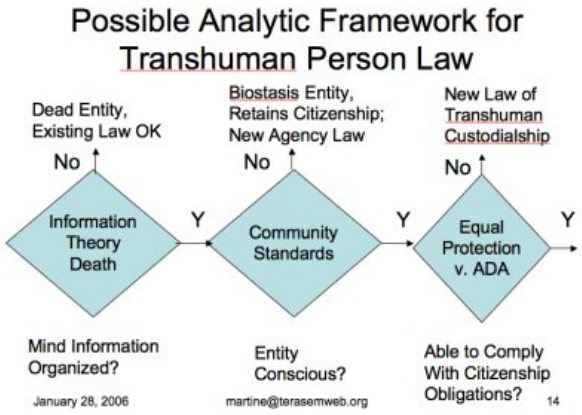


*Image 7*

We may need to evolve to an information theory definition of death instead of heart death or brain death, which have been the prevailing definitions. If an individual's mind information is still organized, we have to ask if they are really dead under our concept of information theory death.

We then must question whether that entity is conscious. Consciousness is a complex subject. My favorite definition of consciousness is borrowed from Justice Potter Steward's definition of pornography - that he can't define it, but he knows it when he sees it. When he said he knew it when he saw it, he said finally that we will have to revert to community standards of what pornography is to a particular community. Perhaps we will need community standards with regard to whether or not an entity is consciousness.

Finally, if an entity is not dead and they are conscious, what type of legal rights do they have? Does the Equal Protection clause of the Constitution apply so that they have the same rights as people who have been biologically born in the United States?

We have a number of years to explore these decisions. We certainly don't have to solve them at the first colloquia. But if we could accomplish what the first Colloquia on the Law of Outer Space did - create an agenda of legal issues to be addressed - we will be on a good track. Finally, if we do agree that transhuman individuals should be granted transhuman citizenship, it would certainly be a huge leap to grant citizenship based on an individual's desire for citizenship, human rights, and organization of mind information rather than based on a genome or a phenotype.

**Evolving Technology, Evolving Law**

If it seems as though making the leap to believe in the possibilities of transhuman persons is too great, remember that in 1958, it was just as big a leap to cast aside the concept of national sovereignty being based from the core of the earth and reaching in a cone out into space and replace it with the idea that national sovereignty ending at some point. Law must evolve with evolving technology.

"*Law must evolve with evolving technology.*"

Copernicus' theory of the earth's rotation numbered the days of old-school sovereignty. The notion of sovereignty sweeping out to the cosmos in a fixed cone is rendered irrelevant when we accept that the earth is rotating on an axis because everybody's cone would sweep the same sectors of cosmic space. Going all the way back to Copernicus, the legal artifice of national sovereignty was already becoming illogical.

In the very same way, Turing's theory of machine consciousness has begun to number the days of old-school citizenship. Turing asked, what if you could converse with a machine and you couldn't tell the difference between conversing with a machine and conversing with a person? Is not that machine as conscious as the person? If we don't evolve law with evolving technology, we will face conflicts of dysfunctional law.

The founders of space law did their best to avoid space conflict (between the US and the Soviet Union in particular) over conflicts of law. Today, we are not at risk for a war with Russia over transhuman rights, but could there be a war between humans and transhumans, between flesh and electronic substrate? That's certainly a common theme of dystopic science fiction plots and it is something that we can avoid with prior legal development.[3]

How might we do in ten, twenty or fifty years? Image 8 depicts some possibilities.

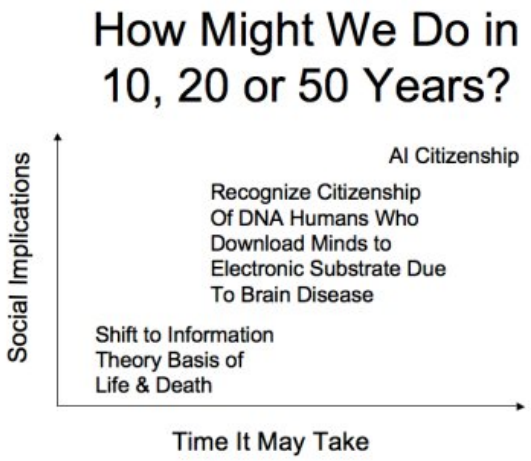


*Image 8*

Certainly, the bigger challenge we undertake, the longer it will take. A shift to an information theory basis of death is not that big of a change. We just recently made a big leap in the past century from heart death to brain death. So perhaps this is not that big of a leap. It may take a relatively short period of time. At the other end of the spectrum is unifying artificial intelligence and citizenship, which might be a pretty big leap for society to take and may take quite a bit longer. The time to start the dialogue is now.

*Martine Rothblatt started the satellite vehicle tracking and satellite radio industries and is the Chairman of United Therapeutics, a biotechnology company. She is also the founder of Terasem Movement, Inc.*

[1] *In Greek mythology, Kamira was a daughter of Danaus who was worshipped on the Greek Island of Rhodes (originally one of the "seven wonders of the world"). Principally, she was venerated in Kamiros, which was named after her. http://en.wikipedia.org/wiki/Kamira (January 5, 2006 2:15 P.M. EST)*

[2] *The proceedings of the Colloquia on the Law of Outer Space have been published by the AIAA (American Institute of Aeronautics and Astronautics). http://www.aiaa.org (January 23, 2006 4:38 P.M. EST)*

[3] *DYSTOPIA (dystopic): An imagined universe (usually the future of our own world) in which a worst-case scenario is explored; the opposite of utopia. http://en.wikipedia.org/wiki/Dystopia (March 3, 2006 11:52 A.M. EST)*

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# Functions of a Trust Protector during Biostasis and at the Time of Cryogenic Revival

**John Dedon, J.D.**

*This article was adapted from a lecture given by John Dedon, J.D. at the 1st Annual Colloquium on the Law of Transhuman Persons, December 10, 2005, at the Space Coast Office of Terasem Movement, Inc., Melbourne Beach, Florida.*

***Editor's Note:*** *Attorney John Dedon is a Partner with Odin, Feldman, Pittleman, PC in Fairfax, VA. In this article, he skillfully strolls through the hypothetical needs of Mr. & Mrs. Cryonic, an average American couple who have opted to be cryogenically preserved. Dedon addresses the Cryonic's specific and potential fiduciary needs (during biostasis and upon cryogenic revival) pertaining to trust protectors, asset management, beneficiaries, and possible litigation. These specific needs dictate that there be flexibility within current and future laws involving the rights of persons so preserved, and their families.*

A trust and estate lawyer spends most of his or her time trying to save significant amounts of money in estate tax, ensuring that assets are passed down through the generations and protected for their descendants. But what are the functions of a trust protector during biostasis and at the time of cryogenic revival?[1]

**Mr. and Mrs. Cryonic**

We begin with a hypothetical situation in which Mr. and Mrs. Cryonic are establishing a trust.[2] The primary purpose of the trust is to designate assets to be available upon their revival from a cryogenic state. These assets will be in place and protected during biostasis and also waiting for them when they are revived.[3] Within their estate planning, the couple has an option of placing the assets in a trust. If they do not have the resources to do this, the assets can be placed in a trust upon their death. We can explore this scenario within the framework of these traditional tools.

The couple may opt to create a dynasty trust, which is quite common. A dynasty trust is a trust where assets will pass down through generations, to future children and family members. This tool is already in existence; what do not exist are the rules for what happens if Mr. or Mrs. Cryonic does not come out of biostasis. In this case, where do the assets go? Does the law even allow to create such a trust for or those who have been cryogenically preserved?

As we explore these questions, let's set the scene. Mr. and Mrs. Cryonic are the grantors who have created a trust in which they are the primary beneficiaries. There may be other beneficiaries as well, but it is primarily for their use. In this situation, we will need a trustee who will be the person or entity that manages these

assets. Who should serve as trust protector in this situation and what exactly is their role during biostas and upon cryogenic revival?

**The Trustee**

First, let's explore who the trustee is. The trustee could be an individual, such as a family member. Ideally, however, as no one knows how long the trust will last, it is preferable to use an institutional trustee. An institutional trustee will provide permanence.

*"In a nutshell, the trust protector does what the grantors ... would do if they were alive."*

In choosing an institution, find one that will always have a successor, even if it is merged with another institution. An institutional trustee can provide professional management because this is something the institution does for a living. You also want the fiduciary duty that a corporate trustee can provide. A corporate trustee is going to be licensed and regulated and accustomed to handling these situations on a daily basis. In the case of a dynasty trust, it would be unusual for anyone but an institutional corporate trustee to serve as manager of the trust.

**The Trust Protector**

What is the role of the trust protector? In a nutshell, the trust protector does what the grantors (Mr. and Mrs. Cryonic) would do if they were alive.

The trust protector oversees the trust. In this role, we need someone who is flexible and can adapt to changes in the law and related facts and amend the trust as necessary. It would not be ideal for the trust protector to be an institution because an institution would not have this flexibility. It is unlikely that family or beneficiaries could serve as trust protectors because the trust may persist for decades or centuries, longer than their life spans.

We've eliminated family and institutions; the logical entity for this role is a law or accounting firm. These entities have the licensing requirements and expertise, but are also flexible and relatively free of restrictions and regulations. They are able to move in and make appropriate changes. It is worth noting that a lawyer or CPA, as trust protector, has the same fiduciary duty of impartiality and loyalty to Mr. and Mrs. Cryonic and their beneficiaries as the institutional trustee does.

**Functions of the Trust Protector**

What are some of the specific things that the trust protector does? The trust protector might be asked to change the situs of the trust.[4] Currently, the law allows one to create a dynasty trust that continues in perpetuity for beneficiaries. The trust protector needs to make sure this is possible. For example, South Dakota, Delaware, and Alaska are states that are friendly to dynasty trusts. If the state's laws should change, the trust protector could initiate a move to a more amicable environment.

The trust protector would also be trusted to change the trustee if they became unfriendly to what the grantor intends for their trust. If the trustee's philosophy unexpectedly changes or they are merged with another institution, the trust protector can find a new trustee.

If a trust instrument so dictates, the trust protector may also be the party to make distributions while Mr. and Mrs. Cryonic are in biostasis. If some of the trust is to be used to support children or grandchildren while the grantors are in biostasis, the trust protector would administer this.

Overall, the trust protector acts on behalf of Mr. and Mrs. Cryonic, perhaps even to the degree that they have the ability to rewrite the trust. The trust protector has great authority, so it is necessary to include restrictions on what he or she can do. For example, the trust protector may pay out distributions, but only within a limited

*"The trust protector must monitor the changing technology surrounding biostatis and revival."*

subset of people. Distributions may be given to children or lineal descendants, but not to other beneficiaries. Some distributions may be given to charities, but only those with a defined purpose.

When designing a trust like this, what happens if it becomes apparent that Mr. and Mrs. Cryonic will not be revived? What happens to the assets in this situation? This contingency must be built into the trust. What happens if the beneficiary that is named does not exist when it comes time to distribute the assets? The trust protector will have the authority and flexibility to make this decision (perhaps giving the assets to a charity or other entity).

In summary, the trust protector for Mr. and Mrs. Cryonic's dynasty trust would have many of the roles of a traditional trust protector. But they would also have other more sophisticated roles requested of them. The trust protector must also monitor the changing technology surrounding biostasis and revival. He or she must keep apprised of the current applications of nanotechnology and nanotechnology laws.

Due to the uncertainty of what we're talking about, it is more important than ever for the trust protector to have a very active supervisory role in monitoring whether the trust is going in the direction the grantors intended it to go. This is not the type of role that a typical institution would want or is equipped to do. It is a role that is more appropriate for a law or accounting firm.

**Biostasis and Alcor**

Let's assume that Alcor is the likely candidate for the preservation of Mr. and Mrs. Cryonic.[5] Should the trust protector not only supervise and monitor the current laws, but Alcor as well? The trust protector must ask if Alcor is financially sound. Are they still offering the expected degree of care? Are there any new competitors to Alcor? Would these competitors be better able than Alcor to care for Mr. and Mrs. Cryonic? Do Mr. and Mrs. Cryonic have the resources that would allow them to be moved from Alcor to another caregiver? The trust protector will have to make these types of decisions.

**Biostasis and Litigation**

There may be a situation where trust funds must be used in order to assist Alcor in caring for Mr. and Mrs. Cryonic. For example, Alcor describes a situation where they needed a court order to get a hospital to release a body to their care. If a hospital is reluctant, the trust protector will be able to use trust funds to pay for legal assistance to persuade the hospital to comply as quickly as possible to assure that Mr. and Mrs. Cryonic have the best chances of revival. In this situation, the trust protector might also be called on to navigate state regulations during such a move.

A situation might arise where the trust could be involved in litigation with Alcor. Perhaps we want to move Mr. and Mrs. Cryonic to a different caregiver and Alcor resists. Flexibility must be built into the trust to allow the funds to be used in this situation. It is impossible to know what all of the specific contingencies will be, thus we must allow for them when designing the trust and considering the role of the trust protector.

*"... what exactly does 'revived' mean during the transition from biostatis to revival?"*

Ultimately, the trust protector should be authorized to use funds within the trust to retain whatever assistance is necessary to see that Mr. and Mrs. Cryonic are given the best chance for biostasis and revival to be successful.

This leads us to ask - what exactly does "revived" mean during the transition from biostasis to revival? I believe it means that the person is functional and able to live an independent life. This "revival" might take weeks or months to occur. Who will make the decisions as to what degree of autonomy is returned to Mr. and Mrs. Cryonic as they come out of biostasis? Again, it will be the trust protector. He or she must work with Alcor and with the trustee to ensure a smooth transition.

**Terminating the Trust**

Once the full revival is complete and independence is attained, we may no longer need the trust. When Mr. and Mrs. Cryonic are back in society and are productive, the trust may be terminated, or at the very least, they should have the option to terminate it. They may very well decide that they need some time to go by before they are entirely comfortable terminating it. They may still wish to continue to benefit from having the institutional trustee manage the assets for a time. At what point do they get full control? The trust protector can play a role in this decision as well.

**Permanence**

When choosing the institutional trustee, we mentioned the importance of permanence. This is also a factor in choosing a trust protector. How do you know that the accounting or law firm will be around forever? Safeguards must be built in to account for the possibility that they may not.

You may have an attorney or CPA that you're working with currently, but in reality, you are hiring a law firm. You are providing that if and when that attorney is no longer around, the law firm will be. It would be wise to have a trust protector with similar or the same institutional knowledge as the institutional trustee.

**Timing**

When does the trust protector get involved? Does the trust protector get involved upon the first or the second death of Mr. and Mrs. Cryonic?[6] Do they get involved before either death? There is a strong argument for involving them while Mr. and Mrs. Cryonic are still living because who knows more about what their intent is and the cryogenic process than Mr. and Mrs. Cryonic?

By working with the couple now to do more than simply have a role in setting up the trust, the trust protector will be able to get a sense of what their intent is. He or she will be able to work with Mr. and Mrs. Cryonic to define that monitoring role mentioned earlier.

By working with them now, the trust protector will be able to institutionalize that role within the law firm and preserve it. This will ensure that we are as close as we can be to the intent of Mr. and Mrs. Cryonic when some of these things need to be acted upon in future years.

As we explore the functions of a trust protector in this new field, we need to ask all of these questions and identify all of the potential issues. We must try to draft this role with flexibility in mind, not withstanding the fact that we have an irrevocable trust that the terms (within certain limits) are to be adhered to long into the future.

**Compensation**

There are a host of ways to compensate the trust protector. He or she could be paid an annual fee which is a percentage of the managed assets. This is often how an institutional trustee is paid. Or, the trust protector could be paid an hourly rate or on a retainer basis.

One creative way to compensate the trust protector would be to build in an additional payment for when Mr. and Mrs. Cryonic are revived. This will create an incentive to monitor Alcor and the related laws and to motivate the trust protector to provide the best circumstances for the couple.

If a lawyer is serving as trust protector, he or she will be concerned about liability. Therefore, the typical liability indemnification provisions that you would see for that institutional trustee may apply for a trust protector.

The uncertainty of the possible situations discussed in this article dictate that the time is upon us to consider the needs, rights, and laws pertaining to cryogenic preservation and securing assets for future use.

*John P. Dedon, Esq. is an estate planning, business, tax and wealth preservation attorney. He has been in private practice since 1984, concentrating in federal taxation matters. John has been quoted extensively in newspapers throughout the country, such as the* Washington Post *and* Chicago Tribune, *on estate planning matters.*

[1] *Cryogenic – adj. a. Relating to or producing low temperatures. b. Requiring or suitable for storage at low temperatures. Stedman's The American Heritage Medical Dictionary, second edition. Boston, New York: Houghton Mifflin Company, 2004:195.*

[2] *For demonstration purposes, Mr. and Mrs. Cryonic represent an average American couple who are planning to be cryogenically preserved.*

[3] *Biostasis: <biology> The ability of an organism to tolerate changes in its environment without having to adapt to them. Origin: Gr. Stasis = stoppage (09 Oct 1997).* *The CancerWEB* Project Online Dictionary (March 3 ,2006 11:53 A.M. EST)

[4] *Situs - (Latin) "Site"; fixed location; place. Usually a place where a thing has legal ties. Law Dictionary for Nonlawyers, Fourth Edition, Daniel Oran, J.D. (2000)*

[5] *Alcor Life Extension Foundation – The world leader in life extension through cryonic preservation, since 1972. http://www.alcor.org/ (March 3, 2006 11:55 A.M. EST)*

[6] *The term, "first or second death" refers specifically to the query: At which time is the Trust Protector to get involved regarding an existing trust created by Mr. & Mrs. Cryonic, at the time in which the first spouse dies, or when the second spouse dies? As statutes regarding Trusts/Trust Protectors involving cryogenics have not yet been brought to legislation, this is merely conjecture and speculative; for educational purposes only. Editor's Note, Loraine J. Rhodes.*

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# Implications of Adaptive Artificial General Intelligence for Legal Rights and Obligations

**Peter Voss**

*This article was adapted from a lecture given by Peter Voss at the 1st Annual Colloquium on the Law of Transhuman Persons, December 10, 2005, at the Space Coast Office of Terasem Movement, Inc., Melbourne Beach, Florida.*

***Editor's Note:*** *Peter Voss insightfully expounds the differences of traditional A.I. (Artificial Intelligence) and adaptive A.G.I., (Artificial General Intelligence). Peter informatively describes Artificial Intelligence as a domain-specific machine with the intelligence capacity of a human, but performing only that which it was specifically programmed to do. Comparatively, Artificial General Intelligence, as expressed, is a machine that will learn adaptively and contextually; will be self aware; and possess self concept.*

*Through A.G.I, Peter envisions that within three to six years, humans will progress to a more benevolent existence and surpass their primitive instincts for survival.*

I believe that the issues surrounding the legal and moral complexity of Artificial General Intelligence are not only extremely important, but also much more urgent and imminent than many people think. In this paper, I make a number of controversial statements that I do not have the room to support. I provide references at the end so that readers can find more information.

"True intelligence is dynamic."

The subject of this article is Artificial General Intelligence, or A.G.I., and how that differs from traditional artificial intelligence, or A.I.. I will also address some of the key uncertainties about A.G.I. For example, many wonder if A.G.I. will save us from various threats that face humanity. Others question whether A.G.I. is a danger to us. I will also explore the moral implications and legal issues surrounding A.G.I..

**A.G.I. Versus A.I.**

First of all, what exactly is A.G.I.? A.G.I. is a bit of a forgotten science or technology.

Originally, A.I. was all about human level intelligence. If you picture what the average person thinks of when they think of artificial intelligence, or you imagine the movie "AI", it is basically a machine that has the intelligence of a human. In reality, only a very small subsection of A.I. research deals with that kind of A.I.

When we speak about intelligence, we must consider the ability to *acquire* knowledge and skills. True intelligence is dynamic. It is

ongoing, as in the way children learn. It is not just *having* knowledge per se. Dictionaries contain a lot of knowledge, but they are not intelligent. Intelligence is not a database of knowledge; rather, it is being able to acquire new knowledge as it learns.

With conventional A.I., the knowledge and skills are programmed. In A.G.I., they are acquired through *learning*, rather than programming. The ability is general, using abstraction (meaning the ability to generalize) and context. We learn our lessons once or twice, and then we generalize. We apply our knowledge to different situations.

We also learn that things are contextual. If somebody sets a rule that you should never hurt another person, we know that it is within the context of not being attacked. Our intelligence figures out that there are expections to this rule.

Conventional A.I. is very poor in generalizing because it is usually written for a specific domain. A.I. tends to be domain-specific, rule-based and concrete. That is why the traditional computer systems that we are using now tend to be stupid and brittle. That is the difference between general ability (being able to learn any kind of task like children can) and being programmed to do a specific task and being rule-bound.

The other distinction is ongoing, cumulative, adaptive, grounded and self-directed learning. This boils down to the way children or even animals learn to interact with the environment. We learn our lessons as we go along. We become smarter and we become better as time goes on because we learn from experience. This is A.G.I. Image 1 provides a visual comparison of A.G.I. and A.I.

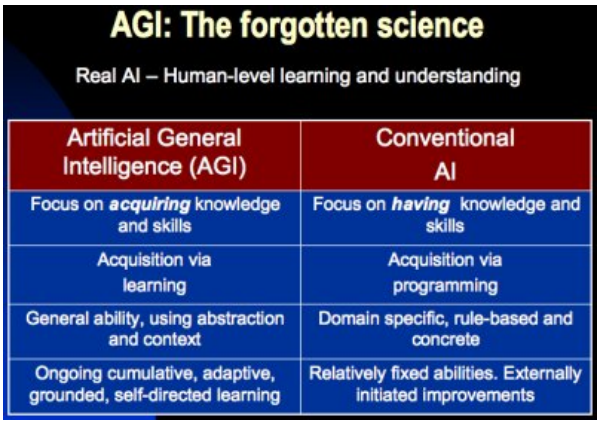


*Image1*

Very few people are actually working on A.G.I. There are many reasons for that. One reason is that the field of A.I. became overly ambitious about fifty years ago. They thought they could crack this in five or ten years. They made that promise and they haven't been able to live up to it. Consequently, A.I. has become basically a swear word, and very few people will touch the subject.

**Self-Awareness**

The implications of A.G.I. are that you have human-level learning and understanding. You have machines that learn adaptively and contextually. What follows from that - and this is a controversial point – is that they will be self-aware. They will have a self concept. They will improve and achieve a point that is called "ready to learn" in developmental psychology and education. At this level, they will have the competence and background knowledge to allow them to really go out and hit the books and learn on their own. Once the system reaches that threshold, it will be able to improve itself.

**Seed A.I.**

The stronger version of that is seed A.I. This means that at some point, the program will become smart enough to become a programmer - like an A.I. psychologist - and to understand its own workings and be able to improve itself. This will be very similar to our own experience as humans as we grow and learn more about

ourselves. We learn how to improve ourselves, except we do not have the blueprints to our design. A.G.I. will have the blueprints to its design. And it will likely become a very good programmer very quickly.

Once A.G.I. reaches that threshold, it will improve dramatically. When A.G.I. has that capability, it will also be able to augment our own ability as humans, but it will be very difficult to actually integrate it with our wetware.[1] That is a difficult problem to surmount.

**Timeframe**

One key question that arises is, how soon will this happen? I maintain that the pieces of the puzzle are out there now. No fundamental technology still needs to be invented. I know this is a strong statement, but I am convinced that this will happen in less than ten years. In fact, our own company is working on it and our own projections are for it to happen in three to six years.

*"... can we put the genie back in the bottle? The short answer is no."*

**Power**

Another question is, how powerful will it be? Are there hard limits to intelligence? There may be hard limits to intelligence at some level. We do not yet know that, but we do know that it will be very powerful. It will be substantially more capable than humans in purely cognitive, reasoning, and problem-solving tasks.

**Take-off**

Will there be a hard take-off? The scenario is that once A.G.I. reaches that ready-to-learn state - the seed A.I. state - some people speculate that within twenty-four hours, the system will self improve so much that the singularity will happen. That is one extreme. Other people believe it will take twenty, thirty, or fifty years for A.I.'s to develop and become smarter and smarter. My own position is that it will be a firm take-off. We are talking months rather than years, certainly not tens of years.

There will be practical limits on how fast the machine can be improved, how fast hardware can be implemented and improved, and how fast systems can be redesigned. However, I believe that essentially, it will be a very short period of take-off in terms of giving society a chance to adapt and embrace it. It will take off certainly much faster than our legal system can move, or society as a whole can adapt.

**Reversal**

Now we ask, can we put the genie back in the bottle? The quick answer is no. There is already too much knowledge out there. We know too much about intelligence and A.I.. It is just a question of when it is going to happen. It is not something you could legislate or prevent even if you wanted to. It will happen. There are too many people all over the world that have access to the essential information and that information is going to grow.

**A Mind of its Own**

The next question is, will it have a mind or agenda of its own? That is a bit more of a complicated question, because it depends exactly what you mean by that. Will it have a mind of its own? Yes, in some very important sense.

Will it have an agenda of doing something with its life? I believe the answer is essentially no, unless you specifically design it to do so. There is not a lot of reason that we would want to design machines that have an agenda of their own. We want them to do things for us. We want them to create value for us. I have already touched on the difficulty in first integrating A.G.I. into human wetware to soften the blow and make us more comfortable, concluding that we cannot do that. It is much harder for us to upgrade our wetware in order to improve humans than it is to build a stand-alone A.G.I..

**Welcome or Fear?**

There are two perspectives on A.G.I.. Should we welcome it? Is it our savoir? Or should we be afraid of it? Do we need A.G.I. to save us from ourselves?

Nick Bostrom wrote a good article analyzing the existential risks, such as runaway biotechnology, in the hands of a common criminal or terrorist.[2] That is scary stuff. Nanotechnology, gray goo -- there are a lot of dangers out there. Of course, there are many social risks that we face every day. There are more and more ways in which single individuals or small groups can inflict a lot of damage on society and that is frightening.

*"... A.G.I. will improve human morality in a very individual way."*

A.G.I. certainly could potentially help us in this area in a number of ways. It could provide tools to prevent disaster. It could protect us directly in some way. It could help by uplifting mankind, generally, resulting in fewer people who have a grudge or a reason to be unhappy. It could make us more moral, which I know is a controversial statement. I really believe that there is a lot of evidence and reason to believe that A.G.I. will improve human morality in a very individual way.

Let's address how much danger A.G.I might pose. First, let's ask if we should be more afraid of an A.G.I. with a mind of its own or one that does not have a mind of its own. This is an interesting perspective that is not often examined. If an A.G.I. has a mind of its own, that mind may well be benign, rational, and moral. If it does not have a mind of its own and it is purely a tool in the hands of a human, then it is only as good or as moral as the human. Therefore, I think not having a mind of its own is much more frightening.

I believe there is little evidence that A.G.I., by itself, will be detrimental to humans, unless it is specifically designed to be. Original applications may have impacts of their own here. For example, there would be a big difference in result between our company (A2I2) building the first A.G.I. or the military. Presumably, there is some difference in the psychology of the A.G.I. whether it was designed with a whole purpose to kill the enemy or to help humans in their day-to-day endeavors. Unlike what we see in the movies, I do not believe that there is an inherent propensity for A.G.I.'s to be evil. I think that's just plain wrong. As I mentioned before, the power of A.G.I. in the wrong human hands is a much bigger concern. The mitigating factor is the positive moral influence that it could have.

**Human Interaction with A.G.I.'s**

I would like to touch on the human interaction on how we treat A.G.I. and how they might treat us. First of all, how should we treat A.G.I.'s from a moral point of view? This question leads us to ask if they actually even desire life, liberty, and the pursuit of happiness. It is very unlikely that they will desire these things. These desires are evolutionary. Nonetheless, how will we treat A.G.I.'s? This is an interesting question. Will there be more moral amplifiers, as I like to call them? Basically, will they make bad people worse and good people better? Will they make us more of what we are, bring out our fears or bring out the best in us?

This is not something that I have explored to a great degree, but I have a strong sense that inherently A.G.I.'s will make us more rational and moral because they will help us reason through the choices and decisions we make. Often just by thinking through the implications of something we want to do and seeing what the actual effect is likely to be, we become more moral and make better decisions. Ultimately, we all desire the long-term outcome of people being happy and living good lives. Yet many of the short-term decisions that people make, such as starting wars or smaller conflicts, have the opposite result.

*"... the mind boggles as to the impact that A.G.I. will have on society ... it will be enormous."*

How will they act towards us? As I said, they will understand the consequences of their

actions and of our actions as well, because they will think them through better. They will also lack the primitive evolutionary survival instincts that are often detrimental to moral behavior.

Overall, the mind boggles as to the impact that A.G.I. will have on society. It is very hard for us to know just what the impact will be, but we know it will be enormous. It will change mankind and society in very, very profound ways. It will impact all areas of our life, including law, politics, and social justice.

I highly recommend the book, "The Truth Machine" by Jams Halperin, which explores a society where lying is not normal any more. The characters are telling the truth because of technology. The author does an excellent job of exploring how that would change society. That is just one possibility. Imagine if a whole number of tasks that people are currently doing can be taken over by A.G.I. and completed in a much better way. What might that lead to? Perhaps this will result in less material poverty and desperation.

I believe that A.G.I. will help us move up Maslow's Hierarchy so that more people will actually be able to think about how to optimize life rather than fighting for survival or reacting to their primitive instincts.[3] It has been well demonstrated that as societies grow more affluent and their basic needs are met, they tend to become more benevolent.

As we use A.G.I., the one thing that becomes clear is that we will rely more and more on the advice of an A.G.I. If we have a wise oracle - our personal A.G.I. - that gives us advice and helps us think things through, that gathers information like a personal assistant but a friend and oracle as well, we will rely more and more on that person. And if it is really a personal assistant, the A.G.I. will know more and more about us, including our deepest secrets, because we will be able to discuss and bounce anything off it.

Of course, because the A.G.I. is so much smarter than we are in so many ways, it will become part of us, and we will rely more and more on its decisions. Then, very soon, we won't be able to tell the difference between our decisions and its decisions because we will see them all as our own decisions. We will see it as part of us. We will also encompass the rationality of the A.G.I., and thus, I believe we will be better for that.

We will have more foresight and better see the implications of things. And when we do something irrational that our genes make us do, the A.G.I. can whisper in our ear and say, is this really a smart thing to do? Do you really want to lose your temper in this situation?

*"A.G.I.'s ... will be quite capable of looking after themselves."*

I actually spent quite a bit of time a few years ago thinking about the origination of ethics and morality. I wondered whether one could devise a moral system based on rationality. That experience underpins some of the statements that I have made to why I believe that an A.G.I. will inherently have many of the moral virtues that rationality brings with it. Many virtues such as honesty and integrity are just a by-product of rationality.

**Legal Implications**

I do not have much to say about the legal implications of A.G.I because I believe events will overtake it. I think the legal implications will, to a large extent, become irrelevant. To briefly touch on the legal points, I think we are going to see that people will be scared of other people having A.G.I.'s.

The government may well decide that the government itself can have A.G.I. with encryption technology, but the average person on the street cannot have that capability. So they might try to outlaw A.G.I. programs by certain machines. But I believe there will not be time to outlaw such things and that it will not be practical.

Even so, I think the focus of the legal system will be to protect humans or government, rather

than protecting A.G.I.'s. I don't think we have to worry too much about protecting the A.G.I.'s. I do not believe that they will genuinely want life, power, and protection. But if they do, I think they will be quite capable of looking after themselves.

Can the legal system respond fast enough? I might lose my green card for saying so, but my answer is no. I think it would be nice to have rational judges and a legal system that is truth-based, but we have an adversarial system. I do not believe that this type of system will be able to keep up with the speed with which A.G.I.'s will progress.

In summary, remember that A.G.I. is fundamentally different from conventional A.I.. Image 2 contains a summary.

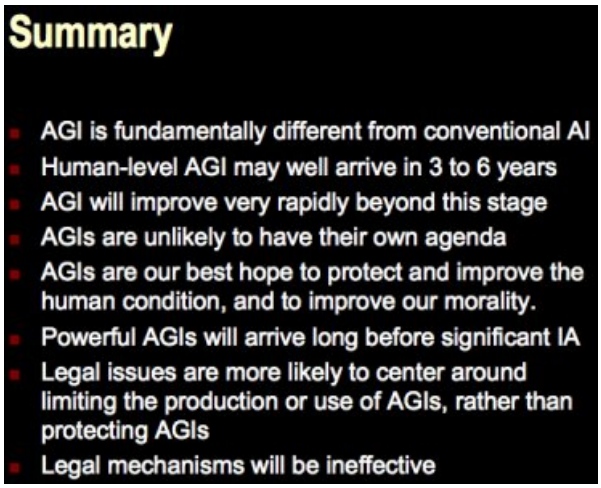


*Image 2*

**What to Expect**

When you talk to A.I. experts and read the literature or look at the state of the art, do not be surprised if you don't find evidence to support the kind of claims I have made. Most people working in A.I. work in very narrow fields, such as heat recognition or vision. I believe the pieces of the puzzle are in place and we are very close to being able to put it together. Look for it to arrive in three to six years. Once we achieve this ready-to-learn stage, it will very quickly go beyond human abilities.

When I say that it will be smart in certain ways, it will be extremely naïve in other ways. A.G.I. won't go through kindergarten. It won't play with friends. It won't have its dog die. In many ways, it will be just a child. But in terms of understanding, learning, and helping us solve problems, it will be extremely capable. They are unlikely to have their own agendas. Their best hope to protect and improve the human condition. I believe that A.G.I is the fastest and most direct way to protect and improve the human condition.

Powerful A.G.I.'s will arrive long before significant intelligence augmentation, before we can improve ourselves. So we will need A.G.I. to upgrade ourselves to improve our wetware. Legal issues will revolve around limiting the production and use of A.G.I.'s rather than protecting A.G.I.'s. And legal mechanisms will be largely ineffective.

Considering all of these implications, how do we prepare for A.G.I.? I am very keen to put something together. I already have a group of people that have started pulling together to think about these things. At our company, we have a core group of advisors who are trying to think ahead and guide this technology in the best possible way that we can. It is an exciting time for us, for all of us.

*Peter Voss is an entrepreneur with a background in electronics, computer systems, software, and management. For the past few years he has been researching artificial general intelligence, and recently started Adaptive A.I. Inc., with the goal of developing a highly adaptive, general-purpose AI engine.*

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Why Machines Will Become Hyper-Intelligent Before Humans Do
http://optimal.org/peter/hyperintelligence.htm

[1] *The term Wetware is generally used throughout fiction (and conversation, notably USENET) to describe one of two concepts. The first, also known as liveware, meatware or the abbreviation PEBKAC (Problem Exists Between Keyboard And Chair), is a term generally used to refer to a person operating a computer. It refers to human beings (programmers, operators, administrators) attached to a computer system, as opposed to the system's hardware or software. In this context the term is frequently used in humorous contexts; for example, in the frequently wry humour of technical support staff, a wetware-related problem is a (semi)polite euphemism for user error. The second definition of Wetware, common in many contemporary science fiction novels (Peter F. Hamilton's neural nanonics and wetware, as well as Richard K. Morgan's wetwire), is used to describe cybernetic augmentation to human beings. http://en.wikipedia.org/wiki/Wetware (February 22, 2006. 2:27 P.M. EST)*

[2] *Nick Bostrom's article is entitled "Existential Risks: Analyzing Human Extinction Scenarios and Related Hazards" and was published in the Journal of Evolution and Technology, Vol. 9, March 2002. First version: 2001 http://www.nickbostrom.com/existential/risks.html (February 22, 2005, 2:17 P.M. EST)*

[3] *Abraham Maslow (April 1, 1908 – June 8, 1970) was an American psychologist. He is mostly noted today for his proposal of a hierarchy of human needs.*

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# The Ethics of Enhancing Animals, Specifically the Great Apes

**Guido David Núñez-Mujica**

*This article was adapted from a lecture given by Guido David Núñez-Mujica at the 1st Annual Colloquium on the Law of Transhuman Persons on December 10, 2005, at the Space Coast Office of Terasem Movement, Inc., Melbourne Beach, Florida.*

***Editor's Note:*** *As a student, Núñez-Mujica explores the Western view that humans are the center of the universe, with a vast gap between man and animal. Through the relatively recent development of the field of Anthropology and the Western world's exposure to other cultures that have revered animals, we have gained an appreciation for complex behaviors and sophisticated consciousness in animals, particularly the Great Apes. The taxonomic status of the Great Apes - which include gorillas, orangutans and chimpanzees – has been changed recently and they are now classified within the same group as humans, hominids.*

*Núñez-Mujica reveals that the Great Apes share virtually the same genetic framework as humans. They display signs of self-awareness and also use language and tools. Therefore, it can be argued that they deserve the same basic rights as humans. He makes a compelling argument for enhancing the Great Apes so that they may reach their full potential and ensure their survival.*

*Humans have pushed the Great Apes close to extinction, and using concepts of transhumanism to enhance this species just might be our only hope of making up for our trespasses against these animals and save them from extinction.*

I would like to explore the ethics of enhancing animals. First, let's examine how we, as Westerners, see animals and how we treat them as a result.

**Human-Centric View**

The Christian point of view, which holds that God is the center of everything, prevailed during the Middle Ages. Christians believe that God created humans in his image and in Genesis, God commands humans to conquer the earth. The humanist point of view, which has prevailed from the Renaissance forward, maintains that man is the measure of everything.

When we consider how humans treat animals, it follows from this background. That is, man is the center of everything and animals are on the periphery. Image 1 shows two familiar Western pictures that reflect this view.

*Image 1*

Until the 20th century, we felt that animals were merely autonoma. They were likened to machines. Perhaps they could feel pain, but they were not intelligent. There was a great gap between man and animal. Later, Anthropology and other behavioral sciences revealed that animals have complex behaviors that we had previously not noticed.

**How Other Cultures View Animals**

In contrast, other cultures have given animals great roles, such as gods and hunters. In these cultures, man is not the center of everything, but part of a continuum. Image 2 shows examples of animals as symbols of power.

*Image 2*

In many cultures, man and animals are all contained in one vast realm of being. Cultural concepts that uphold this perspective -- such as Pantheism, karma, and reincarnation -- are alien to Westerners because they hold that man and animals occupy varying degrees of the same consciousness. It is not a great issue whether you are a dog or a man because in the end, if you keep growing your consciousness, you will end up in the same place.

Many non-Western cultures also do not possess the revulsion that Westerners tend to have towards animals. In fact, they believe that man and animals - in particular, the primates - are kin. For example, in the Popul Vuh mythology, when the gods made man, the first try was monkeys.[1] In some African cultures, it is said that we descend directly from chimpanzees.

*"We now recognize that chimpanzees are more similar to humans than they are to gorillas in the genetic family tree."*

Our increased awareness of animals has changed our concept of them. We now recognize that chimpanzees are more similar to humans than they are to gorillas in a philogenetic tree. Scientists acknowledge that DNA similarities between humans and chimpanzees are much stronger than those between chimps and gorillas. Previously, humans were classified in the hominidae family and the great apes (including

gorillas, chimps, and orangutans) were in a separate family, pongidae. Now, the great apes and humans are all classified in the same group, hominids.

**How are Apes Treated Today?**

Apes are treated with varying degrees of kindness and/or abuse in the world today. The Great Ape Project wants to grant chimpanzees, gorillas, and orangutans similar rights as humans. These rights would be equivalent to the rights that exist between impaired adults and children and their guardians. The Great Ape Project has achieved a higher level of rights for apes in Western Europe, where experimentation using chimpanzees has been abolished entirely. The Great Ape Project believes that the welfare of the apes must be sought for its own good. Apes, as humans, are ends in themselves.

On the other hand, in the United States, about 1,700 chimpanzees are being held captive in biomedical facilities around the country. These animals are protected by laws, such as the Animal Protection Act, that regulate how these animals are to be treated. We must also note that many apes, especially chimpanzees, are currently used and abused by circuses, movies, or other "entertainment" ventures.

Still, there are advocates for the rights of the apes in the United States. A committee from the National Academy of Sciences (formed by primatologists and people from the biomedical experimentation community) states that euthanasia is not an acceptable way of controlling the chimpanzee population. They contend that even though chimpanzees do not have rights equal to humans, they do have a special status when compared to other laboratory animals (such as rats or dogs) because they are so close to us genetically, possessing consciousness and intelligence.

These positions serve to protect the apes, but they also have a more practical side that ultimately benefits the experimenters. If the apes are subjected to psychological or physical stresses, the experiment results will be skewed because the subject (the ape) will not resemble the organism they are trying to mimic (a relatively healthy human being). Therefore, if they are held in small cages and mistreated, the result will be conditions that disrupt the outcome of the experiments.

*"Enhancing is not a new idea. It has existed all along in our history as human beings."*

The debate about the rights of chimpanzees used in biomedical experiments continues. On one side, the Great Ape Project urges the granting of human rights to apes. This organization asks that experiments on chimpanzees not be done if it causes them any harm whatsoever. On the other hand, the United States holds the position that great apes have no human rights, but they do hold a special status compared to other animals. Scientists can experiment with them in painful ways if they are seeking knowledge that will benefit mankind. Neither position allows for anyone to harm chimpanzees for "no good reason".

**What is Enhancing?**

Image 3 shows a rat that has been "enhanced".

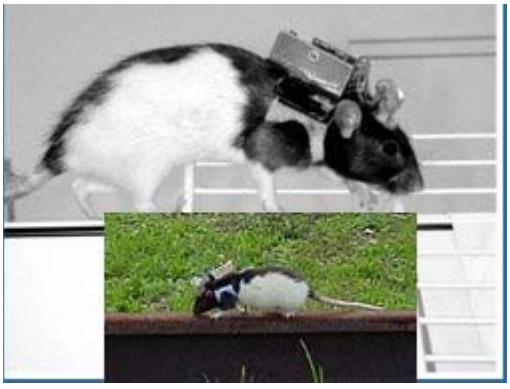

*Image 3*

The device on its neck allows the experimenter to lead the rat to the left or to the right. According to Wikipedia, "uplifting" (which is synonymous with enhancing) means "the theoretical prospect of endowing non-human animals with greater capacities, including and especially increased intelligence. It is highly

likely that biological uplifting would be accomplished through the application of genetic and transgenic technologies, and possibly even artificial intelligence."

**Enhancing, an Age-Old Idea**

Enhancing is not a new idea. It has existed all along in our history as human beings. As mentioned previously, in mythology, gods were presented as enhancers of primitive humans. In the myth of Prometheus, he stole fire from the gods and gave it to us and that allowed us to have a civilization. He was punished for that, but the result of his actions was to enhance humans' capabilities.

In a more practical way, we have been enhancing animals since civilization began by breeding and training animals so that they better serve us. In modern science fiction, the subject has been covered from several points of view by several authors from the classic "Sirius" by Olaf Stapledon, to the "Uplift" saga by David Brin in which enhancing is a galaxy-wide activity with complex rules. Another popular story about enhancing is the frightening work of H.G. Wells, "The Island of Dr. Moreau".

**Why Enhance the Great Apes?**

When speaking of enhancing, I chose to speak about the Great Apes because they are the living beings that most closely resemble humans. Humans share more than 96% of our genes with apes; 98.5% with chimpanzees. They possess characteristics that had previously only been attributed to humans. Chimpanzees speak and understand sign language, they also use tools and transmit its use to their offspring. They show some sense of self-awareness. They show empathy. They have culture.

Amazingly, they are able to lie to their experimenters. They communicate between each other in sign language when the experimenter is not present. From this, we know that they are not just communicating to get a reward from the experimenter.

Because they are so genetically similar to us, enhancing the Great Apes will be easier than enhancing other species. This does not mean that we could not theoretically enhance another species such as dolphins, monkeys or parrots, which all possess high cognitive activity. Still, apes hold the most promise.

**Paths to Enhancing**

Image 4 shows Oliver, the "humanzee". Oliver was a chimpanzee that exhibited a number of striking similarities to humans.

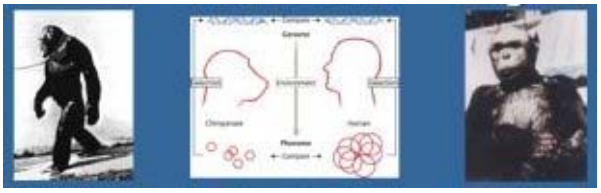

*Image 4*

For example, Oliver almost always walked on two legs. He also had less corporal hair and his jaw had a different shape than other chimpanzees. Oliver was screened to see if he was a hybrid or something like that, but it turned out that he had the same karyotype as a standard chimpanzee. This tells us that the striking mutations that we see in Oliver must be due to regulatory genes. Recently, the chimpanzee genome was sequenced and it was found that we cannot distinguish what is genetically different between human beings and chimpanzees.

The next project is to understand the interaction or regulation of the chimpanzee genome with the environment in order to discover what makes us different. If we do this, we could use that information for human fetal neural grafts; artificial chromosomes with genes that change the expression of other genes; RNA interference (iRNA); artificial implants (that are far and away from our current capacity); and direct modification of developmental genes (i.e., room-for-thought mutation).

I think an analogy can be made between how the genome works and how an orchestra works that allows us to understand why we can look very

different from a chimpanzee, yet have the same genes. An orchestra can play very different pieces of music just by changing the time when an instrument is played. It is the same with genes. By changing what happens when the genes activate or deactivate, we can have striking results.

**Ethics of Enhancing from Two Points of View**

Let's return to the opposing points of view on how apes should be treated as we examine the ethical questions surrounding this topic. Enhancing apes raises many questions. If one thinks that apes have no human rights, we do not have to worry whether they, as a species, are suffering or not. If one believes, as many people do, that humanity is sacred and should not be touched, then it would not be ethical to merge humanity with "lesser beings". However, if apes and humans are merged, the result would be half-human. In that case, would it be ethical to enslave the resulting animal in the same way that apes are currently enslaved?

On the other hand, if one believes that apes should have complete human rights, then we should not manipulate them just for our sake. If we do manipulate them for their own welfare, we must be sure that we are not hurting them. The enhancing must not be painful or performed with any prejudice.

We could also adopt the position that apes are happy the way they are and do not need enhancing. Enhancing would be for our own curiosity, not for their welfare.

Let's address whether or not enhanced apes would end up being enslaved. Currently, there are laws and regulations that dictate what is possible in the treatment of chimpanzees. If we create chimpanzees that are even closer to us genetically, we will heighten their status under these regulations and we may have to give them more rights because they will be more similar to us. Even with a man-centered point of view, we simply could not enslave these creatures because they would be part-human, with even more intelligence and self-awareness than they already have. They will have a sort of biological artificial intelligence.

In addressing the argument that apes are happy the way they are, it can be argued that enhancing apes will result in greater happiness for them because it will enable them to possibly experience life in a deeper way, with more emotion and intellectual richness. Some may argue that enhancing apes is too manipulative, but we have been manipulating dogs and cattle for thousands of years.

*"If enhancing the apes will give [them] more rights..., it might be unethical to prevent it."*

We cannot be sure that slavery will not result from enhanced apes, but we can enact laws to avoid that. Some worry that wars might break out if we create another species with a totally new cultural background. Here, we must take into account that we have fought slavery and racism and this might be a chance for us to become more sensible and accept more diversity.

**Arguments *For* Enhancing the Great Apes**

Enhancing the great apes will give another species the ability to choose their own future. If we manipulate them, that will be the last manipulation they will ever need. From then on, they will possess free will. They will be able to choose what to do.

Enhancing the apes will make us more aware that we share the world with other beings and make us more tolerant. It will help us to better understand ourselves and the nature of consciousness and intelligence. We will have the opportunity to enrich our lives with new, diverse points of view. We will have new art and new ways of thinking about the world.

Apes have brains modeled by natural selection to live in arboreal environments, unlike our bipedal ancestors that lived in savannah. Imagine if they were able to create architecture, painting and sculpture - it could be totally different from anything that man has ever done.

A final argument is that it will give more rights to the enhanced species, so that no one can ever deny that they are smart. If a chimpanzee spoke perfectly about philosophy, law and art, there can be no way of claiming that they are not intelligent and therefore deserve no rights.

The final consideration is that it may just be unethical not to enhance. We in the west make it mandatory for children to go to school because education is the path for a sentient human being to reach his or her full potential. Avoiding enhancing is like preventing chimpanzees from reaching their full potential and preventing them from attaining greater rights.

**Enhancing or Extinction?**

Human populations are growing every year. Mankind is overtaking the natural habitats of the great apes and their population has decreased dramatically. There are only 7,300 orangutans left in Sumatra, a ten-fold decrease in the last century. There are only 250 individuals of the Gorilla subspecies, *Gorilla diehli*. Population of the chimpanzees has dropped from five million to 170,000 individuals in the last century. It is possible that in the next fifty or one hundred years, they could disappear completely except for in zoos. That is a poor destiny for such a smart species, to only be able to contemplate us behind bars. Instead, we should make them our peers.

Enhancing could be the only way to correct our previous mistakes to the apes. Extinction of the great apes would be a terrific loss of a diverse and amazing species. If enhancing the apes will grant more rights to animals, it just might be unethical to prevent or avoid it.

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[1] *The Popol Vuh (Quiché for "Council Book" or "Book of the Community"; Popol Wuj in modern spelling) is the book of scripture of the Quiché, a Kingdom of the Maya civilization in Guatemala. http://en.wikipedia.org/wiki/Popol_Wuj (March 3, 2006 12:00 P.M. EST)*