

“Is Cryonics an Ethical Means of Life Extension?”

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"We all know we must die.

But that, say the immortalists, is no longer true...

*Science has progressed so far that we are morally bound to seek solutions,
just as we would be morally bound to prevent a real tsunami
if we knew how"*

- **Bryan Appleyard**¹

*"The moral argument for cryonics is that it's wrong
to discontinue care of an unconscious person when they can still be rescued.
This is why people who fall unconscious are taken to hospital by ambulance,
why they will be maintained for weeks in intensive care if necessary,
and why they will still be cared for even if they don't fully awaken after that.*

*It is a moral imperative to care for unconscious people
as long as there remains reasonable hope for recovery."*

- **ALCOR**²

"How many cryonicists does it take to screw in a light bulb?

*...None – they just sit in the dark and wait for the technology to improve"*³

- **Sterling Blake**

¹ Appleyard 2008. Page 22-23

² Alcor.org: 'Frequently Asked Questions' 2014

³ Blake 1996. Page 72

Introduction

Biologists have known for some time that certain organisms can survive for sustained time periods in what is essentially a death-like state. The North American Wood Frog, for example, shuts down its entire body system in winter; its heart stops beating and its whole body is frozen, until summer returns; at which point it thaws and ‘comes back to life’⁴. What is now becoming clear is that there is a technology available for humans that imitates this process. What if we, like the frog, could be ‘frozen’ until a period of time in which developing technology could cure our ailments, prolong our lives, and possibly allow us to live forever?

Arguably, the motivation which lies behind the cryonics movement is the human desire for life extension. As the transhumanist Nick Bostrom claims, we all have an intrinsic desire to stay alive and healthy; “when presented with a real-world choice, most would choose the path of prolonged life, health, and youthful vigour over the default route of aging, disease, and death”⁵. Cryonics epitomises this desire for life extension, with steps already being taken for the possibility of future revival; over 200 people have already been preserved at the ALCOR cryonics centre in Arizona.⁶

The possibility of life extension leads us to question our current definition of ‘death’; whether death should cease to be the moment at which the human heart stops beating, or the brain stops functioning. In section 2 I will discuss the definition of the term ‘death’, and how the prospect of cryonic revival affects this definition. If we were to redefine ‘death’, this would have implications for how we treat the dead. If there is even a miniscule possibility for revival, burying our dead could be seen as tantamount to murder.

Other ‘immortalist’ technologies which seek to extend life include mind uploading (scanning the contents of one’s brain onto a computer)⁷, and gene therapy (preventing ageing by stopping the decay of genes)⁸. This essay focuses on cryonics for the primary reason that other life extension technologies have been extensively discussed. As the title of this dissertation suggests, I will be discussing several ethical and moral issues which arise from the cryonics movement. Within each section, I will ask how that problem impacts on how we should think about cryonics by considering whether cryonics is morally permissible and/or morally obligatory. I will conclude that cryonics is a morally permissible but not morally obligatory means of life extension.

I will firstly define the project of cryonics, and trace its historical development. Secondly, I consider how the principles of beneficence and justice entail a consideration of economic resource allocation. Thirdly, I consider how changing the definition of death affects the moral status of the dead and cryonically suspended. Subsequently, I will look at bodily ownership, considering specifically the legalities of cryonics, in which patients ‘donate their bodies as anatomical gifts for research’. Next, I will assess how cryonics may lead to an increased risk of suicide, as well as asking whether the practice can be improved by allowing assisted suicide to become legal practice. The next two sections will focus on the social effects of cryonics, both within a family environment, and subsequently within wider society, in which I will look at issues of identity. In the final section I will

⁴ Roach 2007

⁵ Bostrom 2008. Page 7

⁶ Alcor.org: ‘121st Patient’ 2014

⁷ Agar 2011. Page 1

⁸ NewsRx.com 2012.

consider, arguably, the most pertinent argument *for* cryonics by considering utility, weighing up the possible benefits and costs to society, and considering cryonic suspension within the framework of a wager.

What is Cryonics?

Firstly, it is important to distinguish ‘cryogenics’, ‘cryobiology’, ‘cryonics’, ‘cryonic suspension’ and ‘cryopreservation’. These are often used interchangeably in cryonics papers, but each term refers to very different things. Firstly, ‘cryogenics’ refers to the process of cooling things in general. This is often used in parallel with scientific studies of how substances such as metals behave at sub-zero temperatures; “low temperature engineering including applied superconductivity, cryoelectronics and cryophysics”⁹ Secondly, cryobiology refers to the cryopreservation of living things, and the study of biology at sub-zero temperatures; “in practice, this field comprises the study of any biological material or system (e.g., proteins, cells, tissues...) subjected to any temperature below their normal range”¹⁰ The topic for this essay is cryonics; the cryogenic preservation of humans. Cryosuspension/preservation is the practice behind this; the process of taking a person and suspending them in the hope that one day, revival, cure, and life extension will become possible. Dr. Sandberg, and indeed many cryonicists reject the term ‘freezing’ here, (although this is what many of us think of when picturing the process) as this term suggests the formation of ice crystals, which does not occur in the cryonics process.

In the preface to what is the cornerstone of the cryonics movement, Gruman describes cryonics thus;

“If a man dies today it no longer is appropriate to bury or cremate the body. For there is hope that by keeping it at very low temperatures, physicians of the future may be able to revive him and cure him. And if someone has an "incurable" disease, it is not good practice any more to let him succumb; it is preferable to put the patient into low-temperature storage until better medical facilities become available, or until a cure is discovered.”¹¹

Taken from Ettinger’s text, ‘The Prospect of Immortality’, the argument for cryonics is laid out. This argument is based upon *fact*: that bodies can be preserved upon death, with no deterioration, almost indefinitely; and *assumption*: that medical science may one day be able to cure and revive cryonically preserved individuals.¹² In this way, Ettinger promises, “you and I, *right now*, have the chance to avoid permanent death”¹³, claiming that illnesses which would kill a person today we may one day have cures for, and that the process of death can be reversed. In this way, we should not bury the body of the deceased. We should attempt to save as many lives as possible through cryonic preservation.

The process of cryonics ideally begins within the first two minutes after the heart stops beating, and preferably within 15 minutes of death to prevent bodily damage. This allows the

⁹ ‘Cryogenics’ 2014

¹⁰ Society for Cryobiology 2013

¹¹ Ettinger 2005. Page xii-xiii

¹² Ibid, page 1

¹³ Ibid, page 2

preservation team to control blood circulation and preserve the brain for future revival. ALCOR encourages people to move to hospices near the cryonics centre before death, so that a team can be put on 'standby' for life support procedures upon death. The patient is first placed in a bath full of ice, and breathing and blood circulation are restored. The patients are given drugs to prevent brain damage, and anaesthetic to protect the brain while oxygen consumption decreases. Blood is circulated into a machine which takes on the function of the heart and lungs. The blood is then drained from the body, and replaced with a preservation solution similar to anti-freeze, which supports life at low temperatures. The concentration of this solution is gradually increased until the body is completely preserved. Throughout the process the body, brain, and internal organs are monitored to prevent damage. The solution prevents ice from forming within the body. Finally, the patient is cooled in liquid nitrogen at a temperature of -125° as quickly as possible to prevent ice crystals forming, and then the temperature decreases further until it reaches -196° over two weeks.¹⁴

Scientific experiments involving cryonic suspension and revival have been widely explored. Lovelock in the 1950's was able to revive a rat which had been preserved at 0° using microwave techniques.¹⁵ In 2005, scientists at the University of Pittsburgh cryogenically preserved dogs by draining the blood from the body and replacing it with preservation fluid. The dogs remained in this state for three hours and, when the blood was replaced and an electric shock administered to the heart, the dogs were restored to life with no apparent brain damage.¹⁶ In 2006, a similar procedure was carried out by the Massachusetts General Hospital with pigs. They reported a 90% success rate in 200 tests.¹⁷

Many cryonicists hold out hope that nanotechnology¹⁸ – little machines placed inside the body which can repair bodily functions – will provide the answer to sustained cryonic revival, and the treatment of current illnesses and disease.¹⁹ ALCOR states; “Eventually a time will come when human suspended animation will be perfected. In other words, it will be possible to routinely turn people "off" and "on" for medical time travel, space travel and other purposes.”²⁰ If revival becomes possible, this affects our definitions of 'death' and 'incurable'. In fact, cryonicists see the dead as “temporary incurables”, and propose that cemeteries be replaced by dormitories²¹. It is, in this way, an “ambulance into the future”²².

The first person to have undergone cryonic preservation is Dr. James Bedford, in January 1967²³. Since then, according to membership figures as of January 9th 2014, ALCOR currently holds 121 'patients'²⁴, with 1179 members altogether.²⁵

Much has changed since Ettinger's book was released. Since then, details of cooling procedures, possibilities for revival (nanotechnologies), and legalities of when preservation can occur

¹⁴ Alcor.org: 'Procedures'

¹⁵ Andjus & Lovelock 1955. Pages 541-546.

¹⁶ Mihm 2005

¹⁷ Sydney Morning Herald 2006.

¹⁸ Drexler 1996.

¹⁹ Alcor.org: 'Frequently Asked Questions'

²⁰ Ibid.

²¹ Ettinger 2005. Page viii-ix

²² Cryonics UK, 2012

²³ Darwin 1991

²⁴ Alcor.org: '121st Patient' 2014

²⁵ Alcor.org: Membership statistics.

have changed. Nonetheless, for the purpose of this essay, Ettinger's original definition of cryonics still applies.

This is the topic of examination for this dissertation. The practicalities of the movement will not be discussed in detail here, although many ethical problems in cryonics arise if and when cryonic *revival* is possible (e.g. problems of identity). Indeed, such problems are pointless to consider if cryonics will never be a viable option for life extension. Nonetheless, it is important to consider the ethical implications of cryonics prior to the possibility of it being successfully realised. Many of the examples above highlight the possibility that revival may be possible one day and if it is, we need to have considered the wider ethical and moral implications which follow from it.

Ethical and Moral Issues

Firstly, I would like to distinguish and define 'ethical' and 'moral'. These terms are often used interchangeably in philosophy. However, for this essay I take 'moral' to be a narrow and personal account of human relationships, including questions such as 'what duties do we have to each other?'. This concerns what we *ought* to do in particular situations. 'Ethical', on the other hand, is associated with a broader sense of our place in society. This term would include questions such as 'what is a good life?' This essay will discuss both ethical and moral problems associated with cryonics. Sections 1–4 will consider primarily the moral issues; Sections 5–8 will focus on the ethical.

1. Cryonics and Bioethics: Justice and Accessibility

In order to assess the moral status of cryonics patients prior, during, and after suspension, I will now refer to the four principles of biomedical ethics set out by Beauchamp and Childress in 'Principles of Biomedical Ethics'²⁶, and consider how bioethical frameworks for moral guidance shape our views of cryonics. In 'Cryonic-Hibernation in Light of the Bioethical Principles of Beauchamp and Childress', Charles Tandy considers these four bioethical factors which can be applied to cryonic suspension;

Respect for Autonomy: In 'Cryonics: Public debate gone cold?', Hunting asserts that to prohibit cryonic preservation is to offend a patient's autonomy. He writes, "Any person frozen should be able to determine under what conditions they will be revived, and how they will be treated whilst frozen. The biologically dead patient is not legally dead and so...should be afforded a certain amount of rights and care"²⁷ Respect for autonomy can be achieved "by providing a legal environment that protects a patient's ability to make an informed choice"²⁸. Tandy connects this first principle to cryonic preservation by claiming "If the terminally ill or clinically dead patient was competent and freely chose to undergo the biomedical procedure of cryonic-hibernation...autonomy produces a prima facie obligation for cryonic-hibernation (and against burial or cremation) of the cryonics patient"²⁹.

²⁶ Beauchamp and Childress 2009.

²⁷ Hunting 2008

²⁸ Ibid.

²⁹ Tandy 1995

Non-maleficence: Although the effects of revival (and the possibility at all) are unknown, the process nonetheless “inflicts less damage than the alternative (e.g. burial/cremation). Accordingly ... non-maleficence...produces a prima facie obligation for cryonic-hibernation (and against burial or cremation) of the cryonics patient”³⁰.

Beneficence: For the patient, cryonics is a beneficial procedure to the alternatives of burial/cremation. Tandy claims that “in terms of utilitarian concerns, cryonic-hibernation results in no significant population-resources-environmental problems...beneficence, then, produces a prima facie obligation for cryonic-hibernation (and against burial or cremation) of the cryonics patient”³¹.

Justice: There should be equal and fair access to cryonics. If a person freely chooses the treatment, and can afford it, then this produces a prima facie obligation for cryonics. Tandy notes that “American society has a "just" obligation to make available, as appropriate to its citizens, the biomedical procedure of cryonic-hibernation as part of the "free" system of...health services”³².

Considering these principles, Tandy concludes that “biomedical professionals have a strong (not weak) and actual (not prima facie, but binding) obligation to help insure cryonic-hibernation of the cryonics patient”³³. His conclusion suggests that cryonics is not only morally permissible but a morally *obligatory* means of life extension. In other words, doctors are morally obliged to ‘save’ patients from certain death by preserving their body if no other treatment is possible. The person is not harmed in the process, and would have faced certain death otherwise. Nonetheless, I will now consider several problems with Tandy’s position.

Some of Tandy’s conclusions seem reasonable here. As Elvin notes in ‘Vi Veri Universum Vivus Vici’, if cryonics is a viable means of life extension and cure, then it allows people to continue a fulfilling life. In accordance with utilitarianism, therefore, we are morally obliged to perform cryonics.³⁴ However, the principles of beneficence and justice can be questioned. In terms of beneficence, it could be argued that it is *better* to be dead than to be cryonically preserved; it *can* cause harm. In terms of justice, which concerns the bigger social picture, the economic effects of cryonics must be taken into account.

Tandy’s conclusion for beneficence is that cryonics is better than certain death (burial/cremation). However, I do not think that cryonics *is* necessarily better than death. As I will discuss in section 6, cryonics leaves a space for the possibility of reawakening into a society in which you do not belong any more. Furthermore, Tandy’s argument concerning Justice is that everyone should have free and equal access to cryonics, going so far as to argue that life-saving treatments could be put onto a health care system such as the NHS. However, the enormous cost and allocation of resources to cryonics would be completely unfeasible. Indeed, it would deprive other people of treatments which have a much higher success rate than the doubtful outcome of cryonic revival.

³⁰ Ibid.

³¹ Ibid.

³² Tandy 1995.

³³ Ibid.

³⁴ Elvin 2009.

Economically, money could be relocated to better and more certain means of saving the lives of people already living.

Tandy's proposal is taken by many to be an example of egotistical selfishness. It makes sense to disregard any suggestion of moral obligation here, and instead pool our resources into a more ethical alternative – such as treating the millions of people who die from malaria every year. This objection concerns charitable giving, and how wealth should be distributed. While Tandy argues that the utilitarian argument supports moral obligation for cryonics, Carl Schulman claims that from a utilitarian point of view, money could be better spent by donating to cost-effective charity.³⁵ As Kirkwood writes; “I disagree with life extensionists. I think it's entirely wrong... it's immoral to steer the discussion to the extension of life when we've got real old people in real difficulty”³⁶.

The point being made here is that while cryonics may be an understanding personal choice, and so is morally permissible, it is not morally obligatory, as it would be better to spend the money on funding current research into illnesses. In other words, instead of signing up for cryonics, using up resources and money, why not save the lives of others instead?

Cryonicists such as Tandy would respond to this criticism by saying that in investing in cryonics, you *are* saving lives; you are investing into a field in which current human lives on the planet could be saved. This is the view that Hanson takes in ‘Cryonics as Charity’, in which he claims that paying for cryonics in itself is a cost-effective charitable expenditure.³⁷ Hanson argues that cryonics cannot be described as selfish, as it has large-scale effects which benefit society, and so can be considered a charity in its own right. Hanson gives the chances of cryonic revival a small success rate of 5%. However, he bases this on the fact that people are socially opposed to its success. He proposes that if more people got on board with cryonics, advocating it as a means of survival, the cost of storage would decrease and more people could be saved. He claims, “while many dislike cryonics because they see it as especially selfish, in fact cryonics has such huge scale effects that buying cryonics seems to me a pretty good charity in its own right”³⁸

I do not think this overcomes the objection. Allocating more resources to cryonics could not help as much as charitable donations. Hanson's argument is based on the idea that as demand for cryonics increases, costs will go down and so be widely available. Nonetheless, the current cost of full body suspension is roughly \$200,000, while charities such as ‘stopTB’ save lives at a cost of \$1000 each. Furthermore, Shulman “equate(s) the value of 40 years of life of the typical prospective cryonics sign-up with \$50,000 worth of cost-effective developing world aid”³⁹. This indicates that buying cryonics is less cost-effective than developing world aid. From the point of view of social welfare, donating to charity is more cost-effective than paying for cryopreservation. Tandy's claims of beneficence and justice, therefore, do *not* indicate that “in terms of utilitarian concerns, cryonic-hibernation results in no significant population-resources-environmental problems”⁴⁰. While it may be morally permissible to allow people to cryonically preserve themselves, it does not entail moral obligation.

³⁵ Multifoliatrose 2010

³⁶ Appleyard 2008. Page 54

³⁷ Multifoliatrose 2010

³⁸ Hanson 2010

³⁹ Multifoliatrose 2010

⁴⁰ Tandy 1995

There are two further problems with Tandy's conjecture that there should be free and equal access to cryonics. Following the principle of Justice, Tandy claims that if a person freely chooses the treatment, and can afford it, this produces a *prima facie* obligation for cryonics. However, this raises issues concerning availability and the expense of cryonics. Firstly, only the rich can afford treatment. Secondly, this raises the question of whether we *should* allow equal access to cryonics; whether we should instead choose which people are preserved and which are not.

In terms of the first issue (only the rich can afford treatment), Tandy's view is not practical. It takes large amounts of money to cryopreserve people, and, as I have just discussed, the price of preservation is unlikely to go down unless a majority of earth's population sign up. Even so, a recent article published by ALCOR has revealed that prices have in fact *increased* since the practice first began in the 1960's from \$60,000 to over \$200,000 which, even with inflation, is dramatic.⁴¹ Thus the procedure does not allow for poor people to take part in cryonics, and this is unfair. As one sceptic of the movement writes; "poor people can't afford cryonics and the poor make up the vast majority of the world's population. Therefore, there will eventually be only a few people (preserved) and they will all be rich. They may even keep refrigerators full of spare parts taken from the poor."⁴²

ALCOR's response to this is to draw attention to their 'life insurance policy', which, as Dr. Sandberg pointed out to me, is the same price as buying gym membership.⁴³ This procedure enables you to deposit small amounts of money each month into a central fund, which then covers the cost of preservation upon death. For example, if a 30 year old man decides to purchase a \$500,000 life policy, this entails a payment of \$230 a month. Even though he only needs \$200,000 for his own preservation, this policy takes into account the income which would be lost to his family upon his death. Furthermore, this includes a fee of \$100,000 which goes into ALCOR's 'Patient care trust', deliberately set up for those who cannot afford treatment.⁴⁴

However, this still does not mean that equal and free access to cryonics is ethical or viable. Indeed, as I will discuss in section 4, such procedures alienate the patient from their friends and family financially, by taking up considerable funds which would otherwise be given to the people left behind upon their death, even with such insurance policies. As Hanson notes; "Wouldn't any reasonable person — one worthy of revival — dedicate a lifetime's accumulated resources to helping their children...instead of splurging it all on a chancy, self-important gamble for personal immortality?"⁴⁵ Furthermore, even though it is required that patient donate to the 'Patient Care Trust', the donation does not fund a whole person's preservation. Thus the ratio of rich to poor would be great, and the criteria for who would be poor enough to qualify is not made clear. If more poor people wanted to sign up for cryonics, this depends on the number of rich people signing up, and so the system can never be truly equal.

Hanson's comment of someone being 'worthy of revival' raises a further issue of *who* should be cryopreserved. Stephen Hawking, for example, would be an interesting contender. His work on astrophysics and the nature of the universe is highly influential in the field of physics. Nonetheless, he suffers from Motor Neurone Disease, and is undeniably deteriorating. With the cryonic hope not

⁴¹ Alcor.org: 'Cryopreservation Funding and Inflation: The Need for Action' 2011

⁴² Carroll 2002

⁴³ Dr. Sandberg interview

⁴⁴ Hoffman 2012.

⁴⁵ Hanson 2012

only of revival, but *cure*, Hawkins is a subject who could benefit from the process, and benefit society as a whole. On the other hand, it could be argued that we should not allow cryonics to those who are detrimental to society, such as (arguably), the mentally unwell or criminals. What would be the criteria for making such judgements? Who has the right to make such judgements at all, given that this entails placing different values on human lives? If, as the cryonicists argue, failing to preserve is tantamount to murder, it is necessary to determine which justifications, if any, we can have for failing to preserve a person.

Some may argue that we *should* be able to choose, at least initially, who to preserve in order to improve future society. For example, in the film ‘When Worlds Collide’, a star is discovered which is on course to collide with the earth within 6 months. Despite widespread disbelief, Stanton – a wheelchair bound man – offers a group of scientists the money needed to build a spaceship to take a number of people to Zyra, a planet orbiting the star, which may or may not be habitable. In return, Stanton insists he be able to choose the ship’s cargo and crew. He is denied such control, and is instead given a place on the passenger list, despite the limited number of seats. The rest of the passengers are decided by random. Many such as Randall, an airline pilot, decide to stay behind on earth, due to his limited skill sets which would be of no use to anyone on the ship, nor a future society. On the day of launch, Stanton is refused a seat on the craft, on the grounds that he killed another man, and is useless to a future society.⁴⁶

This film bears striking resemblance to cryonics. The main consideration here draws on the choices made by the crew about who should board the craft; only those who benefit a future planet, or those selected at random? Those convicted of crimes or the innocent? Furthermore, giving a seat to a murderer would deny an innocent person a seat (or in the case of cryonics, a chance at life). The characters conclude that only those who benefit a future society should be allowed to board the aircraft, just as we should choose who to cryonically preserve in order to benefit future society. Indeed, if a future society were to revive the cryonically suspended at all, they are likely to revive the scientists and artists of our day, not the mentally ill or convicted criminals.

However, allowing some people and not others to be preserved raises the issue of *who* should be allowed to make such decisions. The answer would conceivably be to set up committees of medical experts and philosophers to decide the matter, just as HFEA committees provide codes of practice on issues such as human fertilisation and embryology.⁴⁷ Nonetheless, such decisions from a cryonicist’s point of view would concern the line between life and death, and it is difficult to see how people could agree on which people would be chosen for the committee to begin with, or how they could make a decision. Either a general code of practice must be put into place, in which case there would be problem cases (e.g. a ‘genius’ of our time may succumb to Alzheimer’s), or each case would have to be assessed individually, which would not be practical.

I began this section by assessing Tandy’s application of bioethical principles to cryonics. I went on to question his assumption that “biomedical professionals have a[n]...obligation to help insure cryonic-hibernation of the cryonics patient”⁴⁸ I argued that in terms of beneficence, there are cases where it is *better* to be dead than to be cryonically preserved (changes in social/personal

⁴⁶ IMDB.

⁴⁷ HFEA 2012

⁴⁸ Tandy 1995

identity, which will be discussed later in this paper). In terms of justice, I presented an argument concerning charitable giving and the economic effects of cryonics, concluding that the allocation of resources could be better spent elsewhere. Therefore, while cryonics is morally permissible (we should allow people to spend money on it if they want), it is not, as Tandy argues, morally obligatory to ensure the cryonic preservation of humans. Finally, I considered whether cryonics should be available to all. My conclusion to this is that while future society may only decide to revive those who benefit them, in our current time it is simply not viable to decide which people should be allowed access to cryonics and which should not. There would be widespread disagreement if such decisions were to be enforced, and so the practical option is to allow access to all.

2. The Definition of Death

In this section, I will discuss how cryonics may affect our definitions of ‘death’, whether changing the definition of death affects the moral status of the dead and cryonically suspended, and whether this entails moral obligation to cryonics.

There are two questions to be asked here; what is death? And how can we determine its occurrence? The first question is an ontological one, which prompts a definition.⁴⁹ There are several different definitions of death. A patient is ‘clinically dead’ upon the cessation of heartbeat and breathing. ‘Biological death’ has a different meaning; resuscitation is impossible by any known means *currently*. ‘Cellular death’ is the degeneration of bodily cells.⁵⁰ However, the second question is an epistemological one. As Ettinger notes, biological death is the only one accepted by biologists and if this is so, we cannot truly call a cryonics patient dead. For “if we use extreme freezing to prevent deterioration, sooner or later ‘currently known means’ will be adequate, and the body will no longer be regarded as dead”⁵¹ The cryonics patient is thus dead by today’s criteria, but has the potential to be alive again, much as “a drowning victim... may be helped by a respirator”⁵²

Furthermore, a patient can be pronounced ‘legally dead’ by doctors and medical practitioners when their heart stops beating, or when there is a complete lack of brain function. But according to an ethical debate published in ‘Critical Care’, “few if any patients pronounced dead by today’s physicians are in fact truly dead by any scientifically rigorous criteria”⁵³. Indeed Donaldson, a leading figure of the cryonics movement, argues that legal death is a social construct, designed with the intention of justifying the termination of care of dying patients. He goes on to say in this way, the health care system fails the sick and the dying; it is simply a form of euthanasia whereby those most in need are abandoned.⁵⁴ This suggests that we have a moral obligation *not* to bury our dead. For the

⁴⁹ DeGrazia 2011.

⁵⁰ Ettinger 2005. Page 3

⁵¹ Ibid. Page 93

⁵² Ibid.

⁵³ Pages 538-542)

⁵⁴ Donaldson 1990.

cryonicists would argue that if there is the potential of restoring life then we cannot abandon people to certain death, just as doctors would attempt to revive someone who had had a cardiac arrest. As Merkle has remarked, burying someone when future technology could revive them is tantamount to murder. He writes; “A common misconception is that cryonics freezes the dead. As the definition of ‘death’ is ‘a permanent cessation of all vital functions’ the *future* ability to revive a patient preserved with *today’s* technology implies the patient wasn’t dead...present medical practice has erred in declaring a patient ‘dead’ ”. He goes on to emphasise this point; “A second opinion from a future physician – one with access to a fundamentally better medical technology based on a mature nanotechnology – lets us avoid the unpleasant risk that we might bury someone alive.”⁵⁵

Is this definition of death accurate? And does it entail moral obligation? I would argue that although this may cause some to change their *perspective* of the term, the definition itself does not change. Because of this, cryonics is not morally obligatory.

The first question here is whether this changing definition of death is accurate. The answer to this question, I think, is relatively straightforward; the definition of death can and will change *if and when* revival is successful. ALCOR themselves state;

“Cryonics suspension patients are legally dead. Not alive, not in-between, but DEAD. How we as cryonicists think of our patients has absolutely no influence on this label...it is *merely* a label, and labels can be changed. But until we can prove that cryonic suspension patients have a high likelihood of being revivable, we have to play the game”⁵⁶

This would suggest that although people can be preserved if they wish, it is not morally obligatory to do so. Although some may want to spend their money betting on the small chance of revival, it does not entail that we have a moral obligation to cryonics. This obligation only comes into play the day someone is successfully reanimated.

The only possible response by some cryonicists would be that the potential of revival is enough to entail moral obligation. Indeed, this is the reason why the families of those in comas have campaigned for life machines to stay on, even though that patient may be in a vegetative state. ‘Surely’, they would say, ‘if there is any chance of survival, we have to keep the life support on’. As I discuss in the final section of this paper, the idea of a wager or bet on cryonics is possibly the strongest for the movement. Nonetheless, this does not entail *obligation*. If you want to keep your husband, wife or child suspended in the hope of revival and cure one day, you should be free to do so. But society has no good reason to impose that all people should be cryopreserved, instead of buried or cremated.

3. Ownership: Bodies as ‘Anatomical Gifts for Research’

ALCOR acknowledges that having to accept the label of ‘death’ for their patients creates problems for cryopreservation, leading them to place legal clauses within the contract which states that cryonics

⁵⁵ Merkle

⁵⁶ Bridge 1994.

patients “donate their bodies as anatomical gifts for research”⁵⁷. In this section, I will discuss how this is morally problematic for the cryonics patient.

The Ancient Greeks believed that in order to live a good life, and achieve ‘Eudaimonia’ (‘flourishing’), we should be able to control the means and method by which we die. Suffering should not gain power over you. To continue living against your will, in an unhappy existence, would disrupt this balance of Eudaimonia, and so would lead to an unfulfilled life. As Plato writes, patients unable to live a normal life due to suffering should not receive treatment for the prolongation of life.⁵⁸ This is why *control* is an issue to consider when discussing the ethical problems surrounding cryonics. I will illustrate this through an example.

Let us assume that you and your entire family have agreed to be cryonically suspended upon death. You believe that you can therefore die, safe in the knowledge that you will be reunited with your family upon resuscitation, and if resuscitation is not possible, then you have lost nothing. 1000 years later, a new technology has been developed to allow you to regain consciousness, and your life to be prolonged. However, on awakening you are told that there has been a power outage at the cryonics centre since your suspension; you are the sole survivor. (The importance of personal relationships is discussed in section 5). On reflection, you decide that your life is no longer worth living; everyone you knew and loved has gone, and there is nothing left for you anymore. But you are told by the doctors that as the only living patient, you must be kept alive, against your will, in order to be studied, tested and experimented upon, in order to discover the key to life.

This scenario is entirely possible, considering the fact that the cryonically suspended are required to ‘*donate* their bodies as anatomical *gifts* for research’⁵⁹ *Donating* suggests that which is given away freely, but which is nonetheless given away, and we have no right for it to be returned to us. This necessary requirement has further been observed by Hunting, who writes that upon the resuscitation of the body, “the revived person would regain legal status as a person, but lack ownership to their body”⁶⁰. Why, therefore, is this the case for cryonic suspension? Those who wish to preserve their bodies have a different purpose in mind; life extension, and, possibly, the ‘Prospect of Immortality’. So why, if you want to be cryonically preserved, is the ‘donation’ of your body required? And what is the motivation behind it?

ALCOR argues that this clause is beneficial for cryonics patients. Using the label ‘dead’ for cryonics patients allows them to obtain the legal custody needed of the patient’s body upon their death. In ‘The Legal Status of Cryonics patients’, Bridge argues that “Individuals...donate their bodies to ALCOR for ‘medical research.’ When accomplished by a written pre-mortem declaration, this donation effectively removes the ability of family members to “dispose” of the individual in some other way.”⁶¹

However, in the long-run this raises a serious problem, as the patient would no longer have ownership to his/ her body. And as Tierney notes in ‘Perspectives on Embodiment’, it is the ownership of our bodies which shapes our behaviour and gives us the rights to do with our bodies as

⁵⁷ Hunting 2008. Page 26-27

⁵⁸ Papadimitriou, Skiadas, Mavrantonis, Polimeropoulos, Papadimitriou, and Kyriaki J Papacostas 2007. Pages 25-28.

⁵⁹ Hunting 2008. Page 26-27

⁶⁰ Ibid. Page 27

⁶¹ Bridge 1994

we choose.⁶² Thus lacking ownership to our bodies, both during deanimation and upon reanimation, may cause us to lose our autonomy. Furthermore, if a patient does not have ownership to their body while it is suspended, there is nothing to stop the owner destroying that body during cryopreservation, instead of choosing to reanimate it.

In my interview with Dr. Sandberg, we agreed that the clause of transferral of ownership would be problematic for the revived patient. However, Dr. Sandberg pointed out that the problem is avoided if ownership of your body is returned to you immediately upon revival.⁶³ As I have previously explained, the necessity of such a condition is due to the legalities which ALCOR needs to have put into force in order to preserve the body to begin with. If the return of ownership to your body upon re-animation was to be legally endorsed, and such a move was certainly and unproblematically carried through, then ownership of your body *during* suspension is relatively unproblematic.

Nonetheless, there is no reason to suppose that the legalities put into force upon death and subsequent suspension will be carried through to reanimation at all. Indeed, it is very possible to imagine situations in which society experiences great economic problems, and instead of using the money a patient has donated for their suspension, may use this money in other ways, and destroy the cryonics patient. Furthermore, we may lose interest in developing revival technologies, or new social forces may arise which make cryonics reprehensible.⁶⁴ There is no guarantee that a future society would revive the cryonics patient at all, and even less chance of ownership being returned to that patient. Furthermore, this issue becomes even more problematic when we consider the fact that a revived patient with no ownership to his or her body would be a slave, or even a torture object for a future society. This objection gives further weight to my central argument that cryonics is not a morally obligatory means of life extension. If someone wants to take this risk (lacking bodily ownership, and possibly becoming a slave or torture object) then that is an individual decision. But we should not make cryonics obligatory for all persons who die.

The main response to this would be that just as slavery and torture have been largely abolished in western society, there is no reason to suppose that they will be brought back. In fact, if the person has been revived at all, it is unlikely that they will be revived solely for the purpose of being a slave or as an object for torture. Furthermore, it is likely that if a future society capable of resuscitating cryonics patients was in need of cheap labour, it would almost certainly have cheaper sources of it.⁶⁵ But this is a necessary risk that all cryonics patients take, as we simply cannot know what a future society will be like. Since there is no guarantee of the return of bodily ownership, therefore, cryonics is not a morally obligatory means of life extension. As one cryonics blogger puts it; “the assumption that the future society you wake up in is at all desirable for you is a far-fetched one. It ignores the possibility of waking up as a slave with no opportunity for suicide”⁶⁶

4. Cryonics, Suicide and Euthanasia

⁶² Tierney 2003. Page 233.

⁶³ Dr. Sandberg Interview

⁶⁴ Blake 1996. Page 73.

⁶⁵ ‘Timwi’ 2011.

⁶⁶ Ibid.

The prospect of bodily ownership leads into a consideration of suicide and euthanasia. As I mentioned in the previous section, it has been argued (particularly by the ancient Greeks) that to live a good life you must be able to control the means and method by which you die. Indeed, it is clear that cryonic preservation works better when the conditions of death are controlled. So why not deliberately kill someone prematurely (or preserve them while they are still alive) in order to do so properly? Under this condition, cryonic suspension could be carried out *before* natural death, leading to a heightened chance of preserving all the necessary neural and bodily information for revival. In fact, some people may want to begin cryopreservation before any illness takes hold, especially with mental illnesses such as dementia, where repair is likely to be difficult in the future.⁶⁷ Currently, cryonics centres can only preserve those who are already 'legally dead', as to do otherwise would be to carry out assisted suicide. Perhaps, then, it is necessary that assisted suicide be made legal practice in order for cryonics to be completely successful.

For some, such definitions are of paramount importance. In Santa Clara High Technology Law Journal, John LaBouff presents the following example to demonstrate this point⁶⁸; Dr. Donaldson needs to commit suicide before his brain tumour kills him. His desire to die does not stem from mental illness or depression, but from his belief in cryonics. He wants to end his life because he believes he has the chance to live again without the tumour. However, time is against him. He risks dying before he can take his own life and so needs to cryopreserve himself soon, because any chance of reanimation depends upon minimising the amount of damage to his brain by the tumour. Furthermore, he relies upon the staff at ALCOR to assist him, who would be breaking the law. In fact, they are likely to be charged with murder, or assisted suicide.⁶⁹ And in any case of suicide, the law states that an autopsy must be performed (which would destroy any prospect of successful cryonic suspension)⁷⁰

These matters have caused real problems for cryonics. In one ALCOR case, the company was accused of beginning the process of cryopreservation before the patient was declared legally dead. This resulted in a public legal case in which the coroner sought to perform an autopsy on her remains, and several made accusations of murder.⁷¹ Although ALCOR was eventually cleared of all wrongdoing, and no autopsy performed, this shows how it may be necessary to change the law in order for cryonics to be completely successful.

In some ways, a desire to die in the hope that a future society may be able to cure your current ailments can be seen as an act of suicide. Suicide is an intentional act of killing yourself, and as I have previously discussed in section 2, the cryopreserved patient is 'dead' until a time in which revival becomes possible (although if revival becomes possible the definition of death may change and this would not be considered an act of suicide at all). However, Dr. Donaldson's case differs in many ways from most Euthanasia or suicide cases today: he intends to live again; it is active killing instead of passive letting die (turning off a life support machine); and our attitudes towards deliberately killing

⁶⁷ Shaw 2009. Page 519.

⁶⁸ LaBouff 1992. Page 469.

⁶⁹ Ibid. Page 469 - 470

⁷⁰ Perry 2012.

⁷¹ LaBouff 1992. Page 471

someone who is at present healthy (although this would worsen as his tumour develops) are very different from letting a terminally ill and pain-ridden patient end their life.⁷²

Many cryonicists would support the notion that we should improve the conditions of cryonics through euthanasia, specifically in cases such as Dr. Donaldson's. His case was built around right-to-die cases in which the courts recognised a patient's right to have life-sustaining medical treatment withdrawn. His lawyers argued that Dr. Donaldson's right to privacy and self-determination was of greater importance than any state interest in maintaining life.⁷³ Although his case was rejected, ALCOR claims that "considering the contradictory state and the individual interests balances in the right-to-die cases...premortem cryonic suspension could be permitted under certain circumstances"⁷⁴ Thus it seems clear that they would support the legalisation of assisted suicide and euthanasia in certain cases which would 'save' that person from certain death.

Dr. Donaldson's case is an extreme one. There is some argument here for positing that completely healthy persons should commit suicide, before any hint of illness or disease arises. The problem with this would be that premature suicide may prevent the patient from living a good and fulfilling life *now*, in the current life they have with their family and friends. Indeed, it seems strange to suggest that killing yourself early would be beneficial – the chances for cryonics are small, and may even be impossible, in which case you will have wasted years of your life for nothing. Furthermore, as I will discuss in the subsequent section, there is no guarantee that a future life would be better than the one you are currently living, as a person may not fit better into a future society than the one they are living in now.

Additionally, the notion of premature suicide in healthy people would distort the meaning of cryonics. Cryonics does not only concern literal time-travel and extension of life, but the possibility of *cure* in that future life. The idea is that if technology has improved enough to restore life in cryopreserved patients, it will have also be able to cure illnesses which people had previously died from, and if it had not yet done so the patient would remain preserved until a cure was discovered. Thus the patient would have lost nothing. But Dr. Donaldson's case is particularly poignant, as it involves the deterioration and decay of the structure of the brain; something which technology may *never* be able to improve.

I will not go into detail here about the pros and cons of euthanasia and assisted suicide. In brief, the main arguments for legalising euthanasia and assisted suicide would be: that a civilised society should allow people to die with dignity and without prolonged pain, and allow others to help that person if they cannot manage it on their own; that our bodies belong to us, we should be able to do with them what we will and because of this, it is immoral to make people live longer than they want to; "making people go on living when they don't want to violates their personal freedom and human rights. It's immoral...to force people to continue living in suffering and pain."⁷⁵ On the other hand, religious arguments would claim that only God has the right to decide when and how we die, as He was the one who gave us life. Additionally, those who reject the legalisation of euthanasia claim that changing the law would lead to a slippery slope, in which people who did not really want to die were forced to do so.

⁷² Ibid. Page 472-473

⁷³ Ibid.

⁷⁴ Alcor.org: 'The Thomas Donaldson Case' 1993. Pages 589-603.

⁷⁵ BBC 2014

I would be inclined to say that Dr. Donaldson's case should be accepted; that in this individual case, he has a moral right to the premature suspension of his body. Nonetheless, this would depend upon the legalisation of euthanasia and assisted suicide, even if only in this case. I cannot go into developed argument about the legalisation of euthanasia in this essay. But either way, Dr. Donaldson's case does not support the notion of moral obligation for cryonics patients. Again, it is matter of personal choice, and so cryonics is morally permissible, but not morally obligatory.

5. Alienation from friends and family

In 'The Wives of the Cryogenically Frozen', Vanhemert puts forward the following consideration:

"To spend a family fortune in the quest to defeat cancer is not taken, in the American context, to be an act of selfishness. But to plan to be rocketed into the future – a future your family either has no interest in seeing, or believes we'll never see anyway – is to begin to plot a life in which your current relationships have little meaning. Those who seek immortality are plotting an act of leaving, an act...of betrayal and abandonment."⁷⁶

This quote highlights an important criticism of the cryonics movement; that in going ahead with cryonic preservation, we *devalue* the meaning of our current relationships. Nick Bostrom, in his paper "Why I want to be Posthuman when I grow up" claims that in enhancing our human capacities we will experience lives "wonderful beyond imagination"⁷⁷. 'Posthuman' here refers to a human who has greatly enhanced human capacities – physically, mentally and emotionally. This would be similar to the revived cryonics patient. Bostrom claims that in this posthuman society "music...is to Mozart what Mozart is to bad Muzak"⁷⁸. However, this neglects one fundamental point; that Mozart's music may be intrinsically good, in and of itself, regardless of how good posthuman music may be. In a similar way, no matter how good our future relationships may be, to leave our loved ones behind is to neglect the fact that our current relationships have intrinsic value.

In 'Is This What Love Is? The Hostile Wife Phenomenon in Cryonics', Darwin, de Wolf and de Wolf introduce a movement born out of hostility to cryonics.⁷⁹ The claim is that in preventing their husbands from signing up to cryonic preservation, the wives of cryonicists are signing a 'literal death sentence' for their husbands. In such cases, cryonicists resort to hiding their activities from their wives, or have to choose between their current relationships and their hopes for life extension.

⁷⁶ Vanhemert 2010

⁷⁷ Bostrom 2008. Page 5-6

⁷⁸ Ibid. Page 5.

⁷⁹ Darwin, de Wolf and de Wolf.

The paper notes that cryonics should be a matter of personal choice, even if it neglects the relationships the patient currently holds; this is worth overcoming for the possibility of life extension, and even immortality. Even Ettinger, the first true proponent of cryonics, noted;

“This is not a hobby or a conservation piece: it is the principal activity of this phase of our lives; it is the struggle for survival.... ***Divorce your wife if she will not cooperate***....The universe has no malice, but neither has it mercy, and a miss is as good as a mile”⁸⁰

Darwin lists several cases in which interference from wives/ girlfriends/ partners have prevented or hindered their spouses signing up for cryonics, noting in one case that “prospective patients did not inquire because they knew the wife’s hostility/ objections...would cause loss of support, emotional turmoil, or make signing up *futile*”⁸¹ (my italics). What is interesting here is the use of the word ‘futile’ – it indicates that there is at least some concern that life without your partner/ spouse would lack meaning. Two questions need to be asked here. The first is *why* partners of cryonics proponents are hostile to its technology, the second is a normative question; whether they *should* be. After all, what are we if not social, relationship-forming creatures?

In answer to the first question, Darwin, de Wolf and de Wolf give two reasons; economic and “separation in the afterlife”⁸². The first case, economic reasons, concerns the distribution of the estate of the cryonics patient. As discussed in section 1, a prominent ethical problem with the cryonics movement is that it is very expensive, (upwards of \$200,000⁸³). The objection here is that money which would normally go to the patient’s family would be re-distributed to the cryonics company. Thus there may be financial reasons for wanting to prevent your partner being preserved. The argument for ‘social injustice’ is also cited; that the family left behind “feel guilt and shame that their families’ money is being spent on trivial, useless, and above all, selfish action when so many people who could be saved are dying of poverty and hunger now”⁸⁴

However, the main reason, I think, why partners may be hostile to cryonics is due to what the writers refer to as ‘separation in the afterlife’. If cryonic revival and life extension become possible, then our relationships could last vastly longer than currently. When exchanging marriage vows, couples promise to love and honour their spouses ‘until death do us part’. In our current lives, this generally means a maximum of 75 years; the remainder of their lifetimes. However, being cryonically preserved together would mean a lot more than this; to promise to be married for possibly thousands of years. And this could lead to a ‘post-reanimation jealousy’. This concept suggests that if reanimation becomes possible, the husband will not only continue living, but “he can be reasonably expected to form romantic attachments to other women, engage in purely sexual relationships or... marry another woman (or women), father children with them and start a family”⁸⁵. And this, is could be objected, is unjust. As La Rochefoucauld claimed; “Jealousy is always born with love, but does not always die with it”⁸⁶

⁸⁰ Ibid.

⁸¹ Ibid.

⁸² Darwin, de Wolf and de Wolf.

⁸³ Alcor.org: ‘Frequently asked questions’

⁸⁴ Darwin, de Wolf and de Wolf.

⁸⁵ Ibid.

⁸⁶ Ibid.

The second and more pertinent question which needs to be addressed here is whether those who are left behind are *rightly* concerned with these possibilities. This is a substantial moral concern. The patient, in signing up for cryonics, with the full knowledge that his family and/or friends have no interest in doing so, would effectively be saying that his own preservation means more to him than the relationships he currently holds. Such cases would have serious impacts both on the life you are currently living (possibly leading to divorce and the abandonment of your friends/ family), but also, as I will discuss in the subsequent section, the possibility of not being able to form new social relationships in a future society. As one blogger writes; “I value the relationships I currently have with my family and friends, and signing up for cryonics would jeopardize many of these relationships....I do not want to lose these relationships, as they are currently an important part of my life; I would consider my life to be significantly worse than it is now if I had to sever a lot of these emotional ties.”⁸⁷ Furthermore, the husband or wife left behind can justifiably feel as though marriage, a contractual agreement into which two people enter into, is a union which is meant to last for the duration of their lives together. A cryonic decision is contrary to this, and indeed could be seen as a deliberate act of infidelity. The possibility, therefore, of the stress, emotional trauma and damage to your social relationships which may be endured through signing up for cryonics shows that we have no moral obligation to force people to sign up. Indeed, although we may be able to form new relationships in the future, what is neglected here is that our relationships we have *now* have intrinsic value. This is overlooked by the prospective cryonicist.

In conclusion, the paper ‘Is That What Love is?’ concludes by suggesting that it is only reasonable to trade-off cryonics with other values for the chance of life-extension. They suggest that “you can get another wife, but you can’t get another life”⁸⁸. I am not so sure. The possibility of conflict not only *after* reanimation but also *before* it could substantially impact upon the quality of life for the cryonics patient. While some may want to risk the pain of divorce and strained relationships in the off-chance that cryonics works, I think that it is clear that there is no moral obligation for *making* anyone partake in the cryonics movement.

6. Alienation from Society – The problem of Identity in Cryonic Revival

There is a second question of alienation: if cryonic revival does become possible, then there is the chance that when you ‘wake up’, not only do you awaken into a life in which your friends, family, and everyone you once knew and loved are gone, but the society in which you are living is substantially different to the one you left. Perhaps this futuristic society would be so uncharacteristically different that you would experience some kind of ‘identity shift’, in which life is no longer worth living. This would suggest that we do not have a moral obligation to cryonics; it may lead to a life not worth living, and substantially impact upon the quality of that life.

This issue of identity lies outside the cryonicist’s control; by the time the person is revived, society may have changed to such an extent that the patient feels like an alien in their own world. Indeed, many older people of our current generation are already experiencing some kind of identity crisis. With rapid developments in technology, many older people already feel that the world they are

⁸⁷ Lesswrong.com: ‘Social Cost of Cryonics?’ 2011

⁸⁸ Darwin, de Wolf and de Wolf.

living in is substantially different to the one they grew up in. Multiply this by the possible thousands of years for which someone may stay cryonically suspended, and this objection certainly seems problematic. If this is already being seen today, why is there any reason to suppose that a person will fit into a future society hundreds, or possibly thousands of years into the future? As Dr. John Baust, a cryobiologist, has claimed; "The individual who freezes himself or herself to come back in the future makes the assumption he will be a contributor to that society and that they would want him"⁸⁹, when in fact, this may not be the case.

ALCOR's response to this problem is that all humans, regardless of age, sex or disability, have intrinsic value in any society;

"To suggest that human beings have no intrinsic value, but only have value based on whether they "contribute to society" or whether others "want" them, is ethically questionable. If someone made this suggestion regarding care of the handicapped, the elderly, or indeed any medical patient, people would be shocked."⁹⁰

I agree with ALCOR here that an individual *should* be treated exactly the same, and *should* belong to any society they live in. All persons have intrinsic value, whether or not they contribute to future society. Nonetheless, the problem of identity runs deeper than this. Firstly, it is likely that the revived person would not be treated this way; what need would that society have for someone who did not understand their ways and customs? Indeed the reanimated person has a high chance of experiencing changes in the structure of society, language and social norms of behaviour, the inability to finance themselves or find a suitable job in a society which has greatly advanced, the loss of their friends/ family/ acquaintances... This is likely to cause substantial psychological problems, and suggests that there is no moral obligation to cryopreservation. Even though I agree with ALCOR to the extent that people have intrinsic value, this is no guarantee that a patient will fit back into future society.

In 'Cryonics: The Issues' Ben Best downplays this problem, claiming that the patient should be willing to take the chance of identity shift for the prospect of living in a "world of wealth and advanced technology... (where) people will have more time to pursue their dreams and be less constrained by the requirements of work"⁹¹ In fact, he finds this whole objection puzzling, as technological advances are put into place to make the world *better and easier* for people to live in, not worse. Such developed technologies, he claims, would include complex re-integration strategies and "high-tech training technologies and technical means of enhancing mental and physical powers"⁹², which would re-integrate the patient back into society. This would be developed through person-specific data and extensive background knowledge.

Although Best remains optimistic about the prospect of cryonic revival, his solution to the problem of re-integration remains problematic. Firstly, Best's certainty about a life 'wonderful beyond imagination'⁹³ following cryonic revival seems no more certain than a life *worse* than the one lived now; one in which, as I have argued before, you may lack ownership

⁸⁹ www.alcor.org/notablequotes

⁹⁰ www.alcor.org/notablequotes

⁹¹ Best.

⁹² Ibid.

⁹³ Bostrom 2008. Page 5-6.

to your own body, or be used as a slave. More importantly, Best's solution to the problem – reintegration through developed technology and cognitive enhancement – is likely to be even worse than the alienation experienced in the first place. For with cognitive enhancement comes the very real possibility that the identity of that person will be lost completely, as their mind is changed to adapt to the customs of the future society. Much of our identity is grounded in how we fit into the world we are living. To deliberately change this may be to change the very essence of who we are. The enhanced person, in being changed to fit the customs of others, is likely to lose their personal identity entirely.

Connected to the problem of reintegration is deintegration; where the patient fears their isolation from friends, family, possessions, and not having a 'place'. The claim here is that someone may be instinctively drawn to cryonic preservation, but that they should not proceed with such a technology, as in doing so, "he will be torn away from everything he loved... what would the future be worth without his wife, his children, his friends?"⁹⁴. This would suggest that we should not cryonically preserve ourselves at all, because our friends and family may not be able to do the same.

There are several possible responses to this objection; firstly, it assumes that your friends and family will not opt for cryonics. If they do then you will at least have some of your social circle with you in the future. Secondly, you may prefer a friendless existence to none at all. Thirdly, there is nothing to prevent you making new friends in that future society. Indeed, when I put this argument to a panel of Transhumanist's⁹⁵, the responses seemed clear. We come into this world without relationships. Many of us feel we are so embedded in our present habits, associations and friendships, that to be separated from them would be a fate worse than death. But to lose such relationships does not always impact on survival. Such separations are often experienced by immigrants, who do what they must to survive. In a similar fashion, Transhumanist's would respond, *we must do what we can to survive*. We must throw off our emotional attachments in order to achieve longevity. As Dr. Sandberg summed up, "this is not an argument against cryonics; it is rather an argument for getting your family members to sign up"⁹⁶.

Secondly, Natasha Vita-Moore responded that our relationships constantly change over time. The relationships we have as children are not the same as the relationships we have as adults, and, "endemically, it's part of our nature to seek out other people, and with the new technologies... I don't think that family will be considered just biological in the coming years... we will start seeing our extended family as being as valuable as our biological families"⁹⁷. Indeed, we can, and should seek out new relationships, both in a world *without* cryonic preservation, and in a world in which cryonic revival does become possible. Therefore, this is not an argument against cryonics, but an argument to get our friends/ family to join in the process. As Garret Smith, the first man in the UK to sign up for cryonic preservation, objected; "you're saving their lives, for heavens sake"⁹⁸

⁹⁴ Blake 1996. Page 76

⁹⁵ www.youtube.com/watch?v=mPwnjg4N2c8&feature=youtu.be

⁹⁶ www.youtube.com/watch?v=mPwnjg4N2c8&feature=youtu.be

⁹⁷ Ibid.

⁹⁸ Ibid.

The conclusion here is that it may be possible to reintegrate personal relationships and friendships within a future society. The only other possible suggestion to the problem of disintegration from family and friends would be to suggest that we should cryopreserve everyone; this would entail moral obligation, as it would prevent the problem of reintegration and disintegration, as well as ‘literally saving people’s lives’, as Smith asserts. Nonetheless, the suggestion of cryopreservation for everyone, simply on the grounds of avoiding the problem of reintegration, is weak. Although it may be possible to reintegrate into a future society (just as a refugee in a foreign land), we simply cannot know if this will be possible. Furthermore, future technology designed to improve re-integration strategies may cause us to lose our identity entirely. Thus there is no moral obligation to cryopreservation.

7. Utility, Wagers, and Gambles

In a preface to ‘The Prospect of Immortality’, Rostand writes; “we have nothing to lose and, possibly, everything to gain by pressing the search. It is, in a sense, a Pascal’s wager based on faith in science”⁹⁹. In a letter to ALCOR, Sir Arthur Clarke, inventor of the communications satellite writes; “Although no one can quantify the probability of cryonics working, I estimate it is at least 90% -- and certainly *nobody* can say it is zero.”¹⁰⁰ And, in ‘A Door to the future’, Dr. Drexler, developer of nanotechnology claims; “This gamble involves the value of life, the cost of (cryonics), the odds that the technology will work (which seem excellent), and the odds that humanity will survive, develop the technology, and revive people.”¹⁰¹ All of these points suggest thinking about cryonics from the perspective of utility. The question which should be asked here is whether the benefits of cryonic suspension outweigh the costs to society.

An interlocutor, interjecting to this essay at this point may point out this objection; ‘What have we got to lose?’. To many of the issues I have raised in this paper the response may come; ‘So what? Surely life is better than no life? Surely the only alternative is death?’ Indeed, as Hunting claims; “a cost benefit analysis does demonstrate that the economic, social, and individual benefits outweigh the limited costs of cryonic suspension.”¹⁰² And, as Dr. Sandberg noted, if a future society does not want to revive us, we have lost nothing in the attempt to preserve our lives¹⁰³. This is often seen as the strongest argument *for* the cryonics movement; there is nothing to lose in trying.

Thus in many ways, it is useful to consider cryonic suspension within the context of Pascal’s wager. Pascal’s wager was an argument developed by Blaise Pascal in an attempt to show that the potential benefits for believing in God are so great as to justify theism. Pascal argues that we cannot know for certain whether God exists, but we have to ‘wager’ one way or another. Given the possible

⁹⁹ Ettinger 2005. Page ix

¹⁰⁰ www.alcor.org/notablequotes

¹⁰¹ www.alcor.org/notablequotes

¹⁰² Hunting 2008.

¹⁰³ Dr. Sandberg Interview.

gain which we would benefit from if God exists, it is pragmatic to believe instead of not. Pascal's 'super dominance model' is displayed as a matrix which can be written;

	God exists	God does not exist
Wager for God	Infinite happiness	Finite loss
Wager against God	Infinite loss	Finite gain

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If, therefore, you wager for God and he does exist, then you have infinite gain (eternal happiness). If you wager against God and he exists, you have infinite loss (eternal damnation). If God does not exist and you wager for God, then all you have lost is possibly the restrictions you have put on your life through believing. If you wager against God and he does not exist, then you have a finite gain (leading an indulgent life). Wagering for the existence of God dominates wagering against. Infinite gain trumps finite gain and therefore it is better to wager for God than against.¹⁰⁵ Therefore, Pascal concludes that it is pragmatic and rational to believe in God.

Translating this into a wager for cryonic suspension would look something like this;

	Cryonic revival possible	Cryonic revival fails
Wager for cryonics (preserve body)	Immense gain	Neutral
Wager against cryonics (die)	Immense loss	Neutral

Also known as the 'Cryonics Payoff Matrix'¹⁰⁶, the argument is that we potentially gain everything from cryonic suspension (extended life) and we lose little (if unsuccessful, we would have died anyway). As Shaw writes, although Pascal's Wager may be questionable and problematic for theism, it is beneficial for considering cryonics; "successful cryonics would be a form of life-support that delays, rather than returns the user from death...this positive argument is so very strong, both practically and ethically, that it trumps all the self-interested arguments against cryonics, and the ethical objections are not strong enough to prohibit the practice. At worst, cryonics offers a slim chance of living for a few more years. At best, it offers a slim chance of living forever. Ultimately, the Cryonic Wager is overwhelmingly attractive for the rational humanist, even without the prospect of eternal life"¹⁰⁷

In 'A roll of the ice' Blake offers a similar approach to considering how we should think quantitatively about future possibilities regarding cryonics. Considering the metaphysical, social and practical aspects, he claims that we have roughly a 70% chance of cryonics working. His conclusions are based on probabilities. For the metaphysical aspects, his probabilities weigh up the possibility that materialism is true (that the brain carries the mind), and that the body will survive extreme cooling. He sets the metaphysical probability at 90%. Secondly, Blake considers the social aspects which

¹⁰⁴ Hájek 2012.

¹⁰⁵ Hájek 2012.

¹⁰⁶ Merkle.

¹⁰⁷ Cook 2009.

contribute to the possibility of cryonic revival. These are based on whether the preserved patients will remain frozen, avoiding accident, until reanimation is possible; whether society as a whole will survive until reanimation becomes realisable; and whether the funds people pay to be cryonically preserved will cover costs in the long term. This includes “the chances that society will turn irrational, break down (war, economic depression), or take a fervent dislike to cryonics”¹⁰⁸. Given the fact that cryonics centres may not stand the test of time, or that corporate directors could embezzle funds, he puts the social factors at a 33% chance of success. Thirdly, he considers the practical possibilities of cryonic revival, taking into account the probability of nanotechnology working; “self-replicating machines of molecular size that have been programmed with orders to repair freezing damage, bind up torn membranes, and generally knit together the sundered house of a frozen brain”¹⁰⁹. He puts this probability at 90%. Finally, Blake considers the unknowable factor of human choice, claiming that there may be a ruler who bans the practice, loses interest in the prospect, or be overtaken by a more viable means of life extension. All together, the practical considerations of cryonics weigh up to 20%.

Taking all of this into consideration, Blake claims that we have a 70% chance of cryonics working. He concedes that this number is not completely accurate, but helps to place various cryonics issues in perspective. However, the main point Blake is making here is that even if there is a miniscule chance of success (1%, say), you may as well invest in cryonic preservation. Even if, he argues, the technology becomes possible but the social factors remain problematic, the benefits still outweigh the costs. Blake concludes by claiming that gambling is entirely natural to us, but that we cannot envisage the prospect of the future without getting caught up in our own present culture and values. We must place our views in the wider context of time, in order to see that cryonic preservation has overwhelming odds.

Initially, these look like attractive arguments for cryonic preservation; there is nothing to lose in the process, and possibly everything to gain. However, I do not think it is clear what Shaw means by ‘ethical objections are not strong enough to prohibit the practice’. He does not specify *which* objections, and *why* they fail. Indeed, I have shown in this essay that many ethical arguments against cryonics *do* outweigh the possible benefits. In terms of utilitarian concerns, there are more ethical ways for the patient to use their money, and the enormous costs could help improve and sustain hundreds of other lives. Furthermore, changes in social and personal identity may lead to a life which is not worth living, as the patient may become alienated from their friends, family, and society. And if this is the case, then there is no reason to suppose that suicide would be possible; there is no guarantee that ownership of your body would be restored to you upon revival. Finally, signing up for cryonics may devalue the relationships the patient had built up in his lifetime; detaching themselves from their family and friends and giving the impression that they care only for their own survival, thus leading to an unhappy life even before their preservation. Many of these examples show that death would be preferable to cryonics. As Tandy notes; “cost-benefit analysis does not tell us which decision is ethically preferable; it is simply one tool among other ethical tools -- as we attempt to do good”¹¹⁰

Therefore, although cryonicists argue that the Cryonics Wager is the strongest argument *for* cryonics (there is nothing to lose in the process), I have shown throughout this essay that this is not

¹⁰⁸ Blake 1996. Page 72.

¹⁰⁹ Ibid. Page 72-73

¹¹⁰ Tandy 1995.

the case – the wider economic and societal implications show that we can and may have a lot to lose from the prospect of cryonic revival, and that death may be a desirable alternative.

Conclusions

The aim of this dissertation was to establish whether cryonics is a morally permissible and/or morally obligatory means of life extension. I have discussed the ethical and moral implications of the prospect of cryonic suspension. I believe that these issues are important, if solely for the reason that the moral status of cryonics is inextricably linked to its practicality. Considering these issues leads us to question whether cryonics is an ethical means of life extension, and whether to continue with its endorsement in the future.

Firstly, I considered the moral status of cryonics patients by referring to the four principles of biomedical ethics outlined by Beauchamp and Childress in reference to cryonic preservation, and how the principles of beneficence and justice entail a consideration of economic resource allocation. I went on to discuss availability, concluding that free and equal access to cryonics is neither ethical nor viable, and that there are no clear grounds for choosing *who* should be able to sign up for cryonics; it must be made available to all. In section 2, I went on to discuss whether a changing definition of death affects the moral status of the dead and cryonically preserved, concluding that the definition of death will change *if and when* revival is successful. In section 3 I considered the problem of bodily ownership in cryonics, claiming that because ownership is not guaranteed to be returned to you, this raises the possibility of slavery and torture. In section 4 I considered cryonics in the light of suicide and euthanasia, claiming that premature suicide in *healthy* people defeated the object of cryonics, but in some extreme cases, assisted suicide would need to become legal practice for cryonics to be completely successful. Section 5 considered alienation from friends and family, in which I asserted that cryonics leads us to devalue the current relationships we hold, neglecting the fact that our relationships have intrinsic value, and leading to difficulties pre and post animation. In section 6 I considered the problem of social identity, concluding that while some re-integration may be possible, technologies designed to improve this re-integration may cause us to lose our identity entirely. Finally, I considered cryonics from the perspective of a wager or gamble, concluding that while some see this as the strongest argument for cryonics, my previous objections have shown that many ethical arguments *do* outweigh the possible benefits.

I have argued in this paper that cryonics is a morally permissible means of life extension, but that we are not, as Appleyard writes, ‘morally bound’ to comply with cryogenic technologies¹¹¹. Although cryonicists argue that we are morally obliged to comply with cryonics on the grounds that not doing so would be tantamount to murder, I have shown that many of these arguments do not stand up to scrutiny. We should not prohibit the process, but neither enforce the technology; in this sense, cryonics is a morally permissible, but not morally obligatory means of life extension. This is why, as Hunting writes, “Public discussion is urgently needed, before an unchecked technology enters society without sufficient consideration for the ethical or practical issues”¹¹²

¹¹¹ Appleyard 2008. Page 22-23

¹¹² Hunting 2008.

Acknowledgements

Many thanks to Professor Michael Hauskeller, who supervised and commented on several drafts of this dissertation. To Dr Anders Sandberg, who provided me with in-depth information and a first-hand account of cryonics. To Dr Joel Krueger, for his helpful insights on identity. And to my father, Dr Nicholas Cron, with whom I discussed the final draft of this dissertation.

Word count: 12,518

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Dr. Sandberg Interview

Interview conducted with Dr. Anders Sandberg on 5th February 2014 at the Future of Humanity Institute, Oxford.