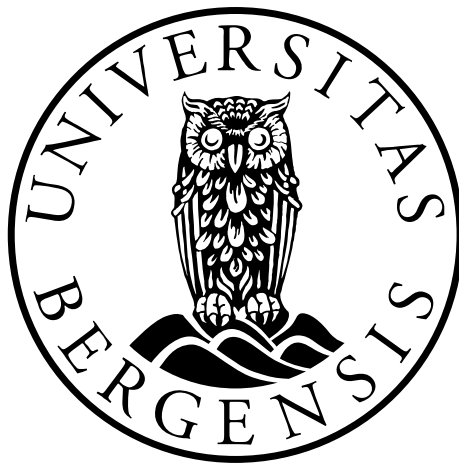


Managing chosen life(spans) – Cryopreservation in Europe



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Abstract

This thesis explores how technoscience is used to extend life and control death through human cryopreservation (cryonics). It is based on multi-sited ethnographic fieldwork conducted in Berlin, Germany, the United Kingdom, and Switzerland, in addition to video-interviews with people interested in human cryopreservation (cryonicists) from across Europe. Where previous anthropological studies of cryonics and cryonicists, conducted in the United States and Russia, have linked cryonicists to transhumanism and described cryonics as an immortality project, I have found transhumanism and immortality to be disputed and of little use among the European cryonicists. I argue that my interlocutors work in the boundaries between pseudoscience and religious-like speculations, and the field of biomedical science. In Europe cryonicists are, as this thesis will show, mainstreaming the idea of cryonics to a much greater degree than their American and Russian counterparts. As death is framed as a process which definition has been changing with secularisation and emergence of new medical technology, death is seen as a problem which can be solved through new advancements in medical technology. I have found a group of people concerned with harnessing the possible potential of human life and managing their own lifetime; death being one such problem in need of a technoscientific fix. In human cryopreservation's technoscientific secularised and medicalised managing with life and death, cryonicists find a potential to preserve their brain-located personhood for a future of their own choosing; A future where life spans are chosen.

Preface

My introduction to cryonics came in a Norwegian pop song shown to me in the small industrial kitchen of Kvarteret, the student culture house in Bergen where I spend much of my formative student years. It was my first year of studying Social Anthropology and a fellow Anthropology student, a few years ahead of me, wanted to show me a song he really liked. “Evig Ung” (forever young) by TØFL tells the story of a young man who with his recent discovery of cryonics at the world wide web has gotten rid of his anxiety for dying and not getting everything in life done; he discovered he could be young forever. Three years later I began on the Master’s program in Social Anthropology at UiB and needed to decide the topic for my Master’s project. I looked around at the departments on-going research project and found the research project *Human Futures: A study of technoscientific immortality (Technoscientific Immortality)*, where one of the mentioned fields of study was cryonics. The project seeks to question what new technologies will do with the understanding of the human being, and how conceptions of death may change in the future. Together with the leader of *Technoscientific Immortality* and my supervisor for this thesis, Annelin Eriksen, I developed my research project of cryopreservation (cryonics) in Europe, and through Eriksen I was introduced to the cryopreservation company Tomorrow Biostasis in Berlin, which would become my main site of fieldwork. Also part of the *Technoscientific Immortality* was the Anthropology student (now PhD candidate) who had introduced me to the concept of cryonics three years prior, Fartein Hauan Nilsen. When postdoc William Dawley joined the *Technoscientific Immortality* team to study cryonics in the United States, I got someone to discuss cryonics with in depth, and compare notes with. Through the *Technoscientific Immortality* project I have gotten to work with a bigger research group, take part in seminars and reading groups, and take part in discussions with anthropologist affiliated with the projects, such as Anya Bernstein, Jenny Huberman, and Abou Farman. Being part of this bigger research group has been invaluable for me in the planning, doing, and writing up of my Master’s project. Thank you so much to everyone involved in and affiliated with the *Technoscientific Immortality* project for great discussions, showing me the insights in anthropological research, and support through my master’s project.

Thank you also to the *Technoscientific Immortality* project and the Meltzer Foundation for the fieldwork scholarships which helped me greatly in conducting a multi-sited fieldwork across north-central Europe.

Thank you again to my supervisor, Annelin Eriksen, for your always encouraging guidance and help, from your introductions which opened up the field site for me, and for clarifying arguments in my thesis when they were all muddled up in my head.

I also want to express my gratitude to all my interlocutors for opening up for me and answering all my questions. Thank you to Tomorrow Biostasis in Berlin, and EBF in Switzerland, for opening your doors to me. Thank you to all the those who participated in interviews for sharing your insights with me. Thank you to Cryonics UK for letting me take part in your training days.

Thank you to my fellow Master's students for the long lunch breaks, shared highs and lows of the research process, and academic and non-academic discussions.

Lastly, thank you to my wonderful parents for always believing in me and giving me all your support.

Setting the scene: the cryopreservation

The ambulance has been stationed outside the hospice for the last 48 hours. Ice has been bought from the supermarket down the road, syringes of medication, anticoagulants and anaesthesia, are being prepared in the back of the ambulance. The three-person cryopreservation standby team has just been informed their patients' death has been pronounced, and now their work begins. They wheel out the ice-bath from the back of the ambulance. A box placed on top of a stretcher on wheels, to hold the patient in ice-water, currently empty and ready for the patient. They wheel the ice bath into the hospice, through the quiet hallways. Outside the patient's room they pass family members, teary eyed after having said a final farewell to their loved one, one of them thanking the standby team as they pass by, for it was an important wish for their loved one to be cryopreserved. Inside the room a nurse is detaching tubes for medication and monitor equipment from the patient. When the patient is ready the team lifts the patient by the bedsheet carefully, one at the head of the patient, one at the feet and one in the middle, and place them into the ice bath. Then they are on their way out again, walking through the hallways and back into the ambulance. As the doors to the ambulance shut the pace quickens. Ice and water are quickly being added to the ice bath, extra ice is being placed around the head of the patient. One of the team gets out the heart thumper, a device which gives heart compressions, attaching it around the patient's chest. As the thumper is being switched on its repeating low-pitched sound fills the ambulance and the patient's chest is being compressed and decompressed. At the same time another team member is intubating the patient by sticking a tube down the throat carefully making sure to hit the windpipe and not the oesophagus. A bag is attached to the tube and manual ventilation begin. The heart compressions and ventilation are used to circulate oxygenated blood through the body preventing decay and cooling the body down as quick as possible. The third person on the team has got the big bone needle ready. It is injected into the upper arm (or the sternum) and contains medication to prevent blood clots. Anaesthesia to prevent the (very low) potential of the patient waking up again is also administered. As the heart thumper and ventilation is keeping oxygenated blood flowing through the patient's body it also distributes the medication in the body. Now the stabilisation, the first part of the cryopreservation procedure, is done. The team now has to wait for the body temperature of the patient to reach 12 degrees Celsius or lower. Ice is being refilled into the ice bath to keep the temperature low.

After a few hours the patient's body temperature is nearing 12 degrees. This is a field preservation and the team gets ready to do the perfusion operation inside the ambulance. Cryoprotectant liquid are being hung up at hooks above the ice bath. Two of the team prepare themselves for surgery, one in charge of the operating and the other assisting. The heart compressions and ventilation of the patient is stopped. The bone saw is brought out and the patient's chest is cut open. As the heart is reached, incisions are made at the artery, carrying blood from the heart, and the vein, carrying blood to the heart. Small tubes are attached to the incisions. The tubes are attached to the bags of cryoprotectant, a type of antifreeze, which runs through a pump, and then into the patient. The small pump situated right behind the ice bath is switched on, its wheezing sound filling the ambulance. The third team member is in charge of the pump and keeping its pressure at a constant level. Cryoprotectant flush through the tubes and into the patient's artery. After a few seconds red liquid comes out of the tube attached to the vein. As the cryoprotectant is being pumped into the patient's body, blood and other liquid is being pumped out. When the liquid runs clear out of the patient, the bags of cryoprotectant running nearly empty, the perfusion is done. Now all the liquids in the patient's body have been exchanged for cryoprotectant and the perfusion part of the cryopreservation is done. The incisions made in the patient are closed up and the patient is ready for transportation to cryopreservation storage facility.

Once at the cryopreservation storage facility the patient is placed into a cool-down box, bringing the body temperature even further down at a slow and steady pace. Reaching the storage temperature of -196 degrees Celsius takes up to five days. Once the patient has reached storage temperature, they are hoisted carefully, via a small crane-system, headfirst into the liquid nitrogen filled dewar. The two-meter-tall metal container holds four patients. At this point, the cryopreservation procedure is complete. The patient has entered the state of cryonic suspension, on pause, not quite dead, nor alive, a potential continuation of life; waiting in the future.



Figure 1: Tomorrow Biostasis ambulance, inside and outside.

Chapter 1: Introduction

When I tell people I have studied cryopreservation three questions always come up; Who are these people? Why are they doing it? How does it all work? In the opening vignette I have answered part of the last question by showing what an “ideal” cryopreservation case would be like. It is based on the several cases presented at the cryopreservation training sessions I attended during my fieldwork and accounts of the cryopreservation procedure as they were told to me by interlocutors. Attending these trainings I was struck by an overall feeling of tightness; being on a tight time schedule, in the tight space of the ambulance, working on the tight distinction between life and death, the tight logic in their arguments, and the potential tightknit relation between the preserver and preserved, as the cryopreservation community is a small one. However, in conversation with cryonicists I was struck by their openness; to speak of death, to share their worldviews, to embrace new technology, their openness to the possibility of failure as well as success, and, above all, the search of an open-ended life with a chosen life span. Trying to answer the questions of who, why and how, I invite you to take part in an ethnographic exploration of cryopreservation in Europe.

Anthropological views on technoscience and death

There are two concepts which will be frequently used in this thesis. The first is technoscience. Technoscience is about technology and science in a specific framework. Let me explain: Technology is in social sciences often broadly defined as any tool or technique humans use to extend their capabilities (Pfaffenberger 1988, 237). In social anthropology the social and cultural aspects of technology, which is often thought of only in material terms, are included in definitions of the concept. Anthropologists have argued for the study of technology as total social systems, concerned with production and consumption of cultural materiality in different societies, and as embodied in use of tools and in skills in everyday life (Brunn 2022). Latour (1987) developed the term technoscience to explore the ways in which science and technology stand in relations to people and societies. Instead of black boxing science and technology by just seeing the objects they produce we must study the process of science and technology and their social influence, says Latour. The anthropological study of technoscience is a study of how science and technology shape our understanding of the world and the relations between nature and culture, humans and society (Eriksen, 2023).

Technoscience is not just an isolated informer for the social world, it is part of a “co-production” (Jasanoff, 2004). It is an integral part of a specific culture. People do not move in and out of technoscience. Technoscience is not only *a* specific context, it is part of any context. Scientists are also daughters and sons, citizens, friends, political activists etc. Eriksen (2023) has argued that in order to understand the values and goals that drive science and technology, it is particularly useful to identify the ideas that emerge on the borders between what is perceived as proper science and what is perceived as popular science, science fiction, or popular culture. It is in this space we find the people of my study. For my interlocutors technoscience is a term they also use themselves, when referring to the field in which they work, the material which constitutes and explains the world around them, the realm in which valid reasonings are made, and that which will bring them into the future. I thus distinguish here between two levels of the concept technoscience: the analytic concept as it has been developed in anthropology and Science and Technology Studies (STS) and more, from Latour and others, and the concept as it is used and developed in the cryopreservation-technology field itself. The latter is more concerned with what is, the former with why it is perceived the way it is.

The second concept central in this thesis is death. According to Engelke (2019) in his review of the social anthropology of death, there have been two main questions in the study of death in anthropology. First, how life persists in funeral and mourning rituals, as a social continuum of the deceased opening for a return to life in forms of reincarnation, rebirth, and/or eternal life. The second is the material of death, the matter of the body and its symbolic meanings. This thesis is a study of the first; how life persists as technoscience keeps death at an arm’s length. The individual’s death gain meaning as it is encompassed in collective rites of passage from life to *after*life and take on cultural and social meaning in different cultural contexts, says Engelke. However, Weber’s (2009) argument of the disenchantment of the world, which comes from Leo Tolstoy’s statement of how death is meaningless to the “civilized man”, can be useful to think with when dealing with the medicalised views of death in the contemporary Western part of the world. Eriksen (2023) asks if death in our corner of the world is losing its social and cultural meaning and whether cryopreservation or other “technoscientific immortality”- projects is seeking to fill the gap. For my interlocutor’s death is seen as unnecessary. In a secularised (Farman 2020) and medically defined (Lock, 2002) context death becomes a problem to be dealt with and for my interlocutors death as stands in the way of life; a problem which can be solved through the means of their technoscience.

How my interlocutors understand the concept of death as a process of informational loss which can be stopped and rewound will be explored in depth in chapter 2.

Introduction to cryonics and transhumanism

The cryopreservation of humans (cryonics) has its beginnings in the transhumanist idea of using technology and science to transcend the human, make the human better, and evolve human intelligence. The first use of the concept of the transhuman is often contributed to Julian Huxley's 1957 paper "Transhumanism". In the paper Huxley describes how, through science and technology, the human species can transcend itself. The human will remain human but will transcend into another state; a new stage of evolution, realising the full potential for human nature and advance towards a better human (Huxley 1968[1957]). Transhumanism is described by anthropologist Jenny Huberman (2021) as a movement not just using science and technology to bring a new culture and society but to bring forth a new posthuman species. Dissatisfied with humans' current condition and biology, keeping human beings from reaching their potential, transhumanists seek technoscience as ways of activating that potential, argues Huberman. This potential is linked to convergence of the biological human with technoscience, such as a fully or partially synthetic body or uploading of the brain and consciousness to computers to be digital and online; or as transhumanist calls it, humans being substrate-independent.

In Russia the ideas of the transhumanist movement date back to the mid-1900 and philosopher Nikolai Fedorov's idea of the "Common Cause" (obshshee delo), according to Bernstein (2015). "The Common Cause" is a project of waking up the dead to transform and evolve humanity to a higher moral and corporal state of immortality. Bernstein identifies two groups of immortalists in Russia today, both stemming from Fedorov's Common Cause. One secular group, the transhumanists, are interested in various themes like artificial intelligence, biotechnology, and cryonics. The other group, Christian Orthodox Fedorovians, see human intervention and use of science and technology as a tool in the common task of the resurrection of Jesus Christ. Both the transhumanist and the Fedorovians believe in using a combination of old archival technologies, libraries and museums, and new technologies, like genomics and informational technology, to fulfil the Common Cause, according to Bernstein.

In the United States, as described by Huberman (2021), the organised and self-identified transhumanist movement began in southern California in the late 1980s and early

1990s with the technology boom. Huberman argues that the development of transhumanism at this time can be seen as a response to the Cold War apocalyptic ethos and a period of “cultural distortion”. To respond to the doomsday visions of the future the Cold War brought, early transhumanist in the late 1980s argued optimistically for more science and technology, and free enterprise, to ensure the transcendence of human beings from their biological limitations to gaining godlike powers and eternal life. According to Huberman the early transhumanists in the United States were; “[...] predominately white, affluent, highly educated males who were confident in their abilities to leave an indelible mark on the future of humanity.” (Huberman, 2021, 31).

In 1998 the Transhumanist Declaration¹ was written by several leading figures in the transhumanist movement at the time, including former CEO of the cryonics organisation Alcor Max More, current director of the transhumanist organisation *Humanity Plus* (H+) Natasha Vita-More, and Swedish philosophers and founders of the *Future of Humanity Institute* at Oxford University Nick Boström and Anders Sandberg. The declarations eight paragraphs set the frames of transhuman ideology, and the work transhumanism is set out to do. The biggest transhumanist organisation today is H+ with its 6000 members. However, in spite of being small in number of members, Eriksen (2023) has argued that transhumanist ideas have a wide reach and must be understood as part of a greater cultural development, influencing understandings and society-wide visions of technology and science (which I will return to in chapter 3). The transhumanist movement is engaged in an array of practices from artificial intelligence (AI), anti-ageing and longevity, biohacking, mind-transferring and mind-uploading, to cryonics. Some of these practices, such as longevity and cryopreservation can be seen as immortality practices where the goal is to overcome one of humanities biggest problems according to transhumanists, death. In my work I have focused on one specific technology which has grown out of this movement; the practice of human cryopreservation (cryonics).

Cryonics is the practice of cooling down the body of a recently clinically dead person to a state of suspension where all the metabolism in the body stops, in theory pausing the body and its functions, but still retaining the brains information. The body and brain are preserved in liquid nitrogen after pronouncement of legal death. Farman (2020) says cryonics is one of the oldest means of continuing life indefinitely but is today mostly seen as, by

¹ The transhumanist declaration; <https://www.humanityplus.org/the-transhumanist-declaration> [11.05.23]

people working for and with cryopreservation, as a backup solution while they are waiting on the advancement of longevity and anti-aging technologies. According to Farman (2020), one of the few anthropologists who have studied cryonicists in the United States, the people choosing cryopreservation do so on two common premises. First: cryonicists do not see death as an inevitable fact of existence, just a biological fact which can be defeated. Secondly, they have an informational as well as neurocentric view of the human person where the structures of the atoms in the brain constitutes all of the self, its abilities and memories (Farman, 2020, 2-3). American Robert Ettinger is often cited as the first cryonicist with his book *The Prospects of Immortality* (1965) presenting the idea of cryonics. Ettinger became the public figure of cryonics in the United States after the publication of his first book, writing several more and most importantly founding one of the two lasting American cryonics organizations, the Cryonics Institute (CI) (Farman, 2020, 94). Ettinger was himself cryopreserved at CI in 2011. CI was founded in 1976 and is one of the two currently operating cryonics organisations in the United States. Today CI has 240 suspended patients and 1940 members to be cryopreserved upon their death². The other, Alcor, was founded in 1972 and currently have 210 patients suspended in liquid nitrogen, and 1417 members³. The Russian cryonics organisation, KrioRus, began its operations in 2006, offering cryopreservation to Russians and internationally. KrioRus states on their website they have 91 people cryopreserved and over 600 members⁴.

There are to date only three ethnographically based anthropological studies of human cryopreservation, to my knowledge. One of KrioRus by Anya Bernstein (2019), and two of Alcor and CI by Tiffany Romain (2010a and 2010b) and Abou Farman (2020). This thesis represents the first anthropological and ethnographically based study of cryopreservation of humans in Europe. My thesis will also show that although the practice of human cryopreservation emerges from the ideology of transhumanism and its ultimate goal: immortality, what I have found in my ethnography is different from what one might expect. Whereas the American and Russian versions have explicitly transhumanist ideals, and the goal of immortality is explicitly articulated, my European interlocutors, working on and with cryonics, did not speak about transhumanism nor immortality. In other words, the ethnography of human cryopreservation in Europe is in many ways extremely surprising. It shows how cryonics, as it is developed in Europe, cuts, or at least partly disassembles, the

² Number found at <https://cryonics.org/member-statistics/> [02.05.2023]

³ Numbers found at <https://www.alcor.org/about/> [02.05.2023]

⁴ Numbers found at <https://kriorus.ru/en/about-us> [02.05.2023]

links to the movement that it is most associated with; transhumanists and immortalists. In Europe they are, as this thesis will show, mainstreaming the idea of cryonics to a much greater degree than their American and Russian counterparts. Eriksen (2023) has called it “second generation cryonics”, thus pointing to not only a difference in *where* these new groups and initiatives (of cryonics) emerge but also to *who and what* drives them. These are young people, and they are appealing to a much younger audience.

A note on the words “cryonics”, “cryopreservation”, and “biostasis”

Cryonics, cryopreservation, and biostasis all refer to the practice of preserving biological matter for future use. Cryonics is the specific practice of vitrifying humans in liquid nitrogen. Cryopreservation is a term used in biomedicine about vitrifying biological material in liquid nitrogen, from single cells to organs to whole humans. Biostasis is a term for preservation of biological matter, pausing the biological processes in the matter. Biostasis can be done by cryopreservation and by other preserving methods, for example using chemicals, such as aldehydes, to fixate (stop) biological processes. Romain (2010b, 176) refers to biostasis as an old term for cryonics. However, it seems to be back in use after Emil Kendziorra made it part of the names of the two cryopreservation organisations he founded in 2019, Tomorrow Biostasis and EBF. He has said he prefers the term as it is not confined to the technic of using cold temperature to preserve and is open to include other technics for preserving humans. Cryopreservation comes from cryo-biology and biomedicine and it seems to have become a preferred term to use, instead of cryonics, by the younger people I have met. Again, I suspect Kendziorra and Tomorrow Biostasis using cryopreservation instead of cryonics, have had an influence. Cryopreservation does also come from the biomedical field which Tomorrow Biostasis wants to be associated with. They want to distance themselves from what they see as the pseudoscience connotations of cryonics. My interlocutors used a mix of cryonics and cryopreservation in their conversations with me, but since cryopreservation was the most preferred term, it is the term I have chosen to use when describing and analysing my own ethnography. However, when I refer to previous studies where cryonics is used, I will use the original word. Both cryopreservation and cryonics refers to the vitrification of whole human bodies in liquid nitrogen, unless something else is stated.

Mapping the field - cryopreservation in Europe

The cryopreservation community is not big. It is spread out across the world and there are few in-person meeting places. Thus, much of the interaction between cryonicists happens online. There are local groups of cryonicists, who also meet and perform standby operations, in a few European cities, such as London, Amsterdam, Stockholm, Paris, and Berlin, but at the time I was planning my fieldwork in the autumn of 2021 these local groups were still almost only meeting online due to the covid-19 pandemic.⁵ Part of my fieldwork was thus online as it was necessary to meet the cryonicists where they meet each other, online. I followed the activity of European cryonicists on social media and joined two online forums for cryonics discussions on the online platform Discord. Discord is an online site for semi-public discussion boards. You need an invite to join a server (discussion board), but many share the server links openly online, such as Tomorrow Biostasis. It initially started as a place for friends to communicate when playing online games together but has grown to be used to discuss many different topics. Today Discord is both used by private friend groups and by public figures and companies to interact with fans and customers.

However, I was also able to do participant observation fieldwork among three active groups of cryonicists in Europe. My fieldwork consisted of one longer stay in Berlin, of about three months, following the daily work of cryopreservation company Tomorrow Biostasis, two shorter visits to the UK attending the organisation Cryonics UK's training events, and also a long-weekend at the European Biostasis Foundation's cryopreservation facility in Switzerland attending the 2023 European Biostasis Conference. Let me now introduce you to the three organisations I studied throughout my fieldwork.

Tomorrow Biostasis, referred to as just Tomorrow by its employees and customers, is a German biotech company which was founded by Emil Kendziorra and Fernando Azevedo Pinheiro in 2019. Kendziorra is the CEO and front figure of the company. Tomorrow offers the services of cryopreservation. This includes; guidance throughout the sign-up and insurance and funding process, full cryopreservation procedure, and storing with their partner EBF in Switzerland. Previously, Europeans wanting to be cryopreserved had to be members of one of the American organisations or the Russian KrioRus. They also depended on local, volunteer groups to do the first steps of cryopreservation upon their death and transport their

⁵ In the spring of 2022 most of the activity in the cryonics community in Europe is still happening online, with only a small increase in in-person meet ups.

body to the United States or Russia. Currently Tomorrow have around 300 members, i.e. customers, who have signed contracts with them (I will explain the process in chapter 3), across 27 European countries.



Figure 2: Map of location of Tomorrow Biostasis members. Screenshot from www.tomorrow.bio/about-us [25.04.23]

The offices of Tomorrow are located in the centre of Berlin. At the time I was there the office consisted of 5 full-time employees and 14 interns coming and going, around 10 at any time. Marketing, engineering, and product management were the three main activities at the office, in addition there was medical doctor, Dev, CEO Kendziorra and CCO Pinheiro.

Being perceived as a professional and medical company is a main goal for Tomorrow. Kendziorra explained to me how important it is for him to bring state of the art knowledge from the field of research-medicine into to the field of cryopreservation. Bringing state of the

art knowledge, methods, technology to the field of cryopreservation implies making cryopreservation a state of the art research field, making it scientific. The current focus for Tomorrow is creating awareness about cryopreservation, making it more palatable, and spread information in factual and scientific terms. “I think that it is right and morally correct that you should if possible, if medically possible, give people the chance to live.” said Kendziorra, [...] you should give people the chance to live how long they want.”

Working in, and advocating, cryopreservation makes it possible for people to make this choice, said Kendziorra and several other employees at Tomorrow.

Tomorrow is as of October 2022 yet to perform their first official cryopreservation case. Their standby team, consisting of Kendziorra, medical professional Dev, and one of the other full-time employees, have done training cases on bodies of persons who donated their body to medical research, through the leader of the German cryonics volunteer group. They are also ready to help the German volunteer group doing standby procedures for members of Alcor and CI. That one of their own members have yet to be cryopreserved, and that their members are quite young, is a fact Kendziorra often points out. As I will show in this thesis, Tomorrow very much changes cryopreservation by bringing a new generation into the field.

The European Biostasis Foundation (EBF) was founded in 2019 and is a non-profit foundation which runs the facilities for storing the patients Tomorrow cryopreserves. Kendziorra is co-founder and board leader of the foundation. The EBF facility opened in October 2022 at the annual European Biostasis Conference. In addition to storing cryopreserved patients EBF is primarily fronted as a research foundation for basic and applied research on cryopreservation and cryobiology. Their mission is, according to their website, to develop: “[...] state-of-the-art technology and medical practice.” And they point out that their work is based “[...] on a shared mission of preserving life. Its primary goal is to advance research, protecting humans from harm and degradation.”⁶ EBF has for the last three years held an annual conference where researchers, both Europeans and Americans, in cryopreservation, cryobiology, longevity, anti-aging, and the rather wide field of futurism are invited to speak about the newest developments in the biostasis field. Members from European cryonics groups are also especially invited to attend. It is open to the public and at the 2022 conference I attended I met cryonicists from across Europe and North America.

⁶ Read at www.ebf.foundation [25.04.23]

Tomorrow is not the only cryo-organisation in Europe. They are the newest. The oldest, to my knowledge, is Cryonics UK. This is a non-profit organisation offering assistance to UK citizens who want to be cryopreserved. The organisation was set up by four young British cryonicists with Alan Sinclair in the lead in 1986. They were members of Alcor and saw the need for equipment in the UK to have on hand to secure fast and effective preservation of human bodies in the UK before being transported to the US. Today the organisation is led by Tim Gibson, a landlord and janitor by profession, who joined in 1992 and had by 2016 done 10 cases of cryopreservation.⁷ “We are the engineers not the scientists” said Gibson in an introduction to the work Cryonics UK does during my visit in September 2022. It is practical work they have learned and continue to learn from actually performing cryopreservations, adapting and changing procedures as they need, according to Gibson. He showed the custom-made adjustable ice bath made up of a frame of white plastic plumbing tubes and a heavy-duty thick blue tarp-like material which was made to accommodate patients of different body-sizes, as an example of their engineering.

I have attended two of Cryonics UK’s quarterly training days. At the first training I was met by a group of 10 volunteers, including Gibson who was leading the training, and 5 guest attendees. Four of the guests were film students making a VR-documentary about one of the volunteers. The last guest was a woman in her 70s who recently heard of cryopreservation and wanted to learn more about it. At the second training 16 people attended, 8 volunteers and 8 guests, including two journalists and a nurse.

Two main issues were brought up by the volunteers several times at the two trainings I attended. The first was the worry about the increasing age of their active volunteer group, and the lack of new and younger recruits. At the first training day all but three of the volunteers were retirees. At the second training day, where other volunteers attended, only three of the 8 volunteers attending were retirees. The lack of volunteers willing to join not only in the training sessions but also on the actual cases was becoming a serious problem for Cryonics UK. It was pointed out by one volunteer that being able to drop everything and spend potentially days on standby, waiting for a patient to die, is not compatible with most people’s daily life. One must be committed to the cause, and the (few) people I met at the training day

⁷Read at www.yorkshirepost.co.uk/news/why-im-going-have-my-brain-cryogenically-frozen-when-i-die-611616 [25.04.2023]

really were. “We are doing this for each other, because if we didn’t; how would we get to be cryopreserved?” said one of the long-time volunteers.

The second issue that was constantly brought up during my participation at the training days, was a desire to professionalise their service and have emergency medical technicians (EMTs) on the standby teams and at trainings. Gibson said they had tried to find an EMT willing to work with them, but it was difficult because the EMTs jobs made them unable to commit. They said they could not just drop everything and come at the moment the standby teams need them.

Thus; the two groups I spent most time with; the Berlin-based Tomorrow and Cryonics UK, are very different. They represent not only two different generations of cryonicists (see also Eriksen 2023) but also two different “philosophies”; the scientists in Berlin) and the engineers (as Gibson described themselves as, in UK), the professionals and the volunteers. Cryonics UK have existed for decades, have a rather aging volunteer group, and are not trained as medical professionals. The people at Tomorrow are the exact opposite. They are young, they are professional, and they are funded by investors.

Methodology and ethics

Gaining access to the cryopreservation community took a lot longer than expected. After a few months of unanswered emails, I finally, with the aid of my supervisor Annelin Eriksen, got in touch with the only full-service cryopreservation company in Europe, Tomorrow Biostasis. Eriksen had visited the company in February 2022, during a short fieldtrip, and agreed with CEO Emil Kendziorra that I could work as an intern and do participant observation. I was welcomed by the team and spent a few months at their Berlin office. When I arrived, I got assigned a desk space and a computer in the open-planned office space before I went on a round to introduce myself where I informed them about my research and ask for their consent in participating. After about two months at the office, during my last few weeks with them, I had sit-down semi-structured interviews with seven of the employees: two of the interns and the five full-time employees at the time. I also had two days when I joined the engineering team. With most of the employees being student interns, around the same age as me and also only staying at Tomorrow for a 3-6 months period, I quickly felt like I was seen as just one of the interns. At photo-day, where a new team-photo for the website was taken, I was encouraged to join in, but I politely declined as I felt it would conflict with my role as a

researcher. At times I did feel it was forgotten by Tomorrow employees that it was not just Tomorrow's customers which were participants in my research but also them, and felt part of the *covert-overt continuum* O'Reilly (2012) says is part of ethnography.

When I first arrived it was decided that I should work on a customer survey, for Tomorrow. This would benefit me, in my own research on who the people interested in cryonics were. I got access to previous data Tomorrow themselves had collected about their customer group, in the form of two surveys and a few interviews. The survey data were useful to gain insight on the demographics of the customer group and was anonymised, but I chose to not use data from the interviews because the interviewees did not know of me or had consented to take part in my research. Together with Tomorrow's product manager I made a new survey, gathering demographic data and asking questions about motivations for signing up for cryopreservation. At the end of the survey there was a request to take part in a longer interview. This was sent to all the current members of Tomorrow by email, and a month later also posted on Tomorrow's discord server. The survey had a brief introduction to me and my project at the beginning and a link to a longer information letter. I got 40 answers and I conducted 16 interviews with members from across Europe per online video. The survey answers were shared with Tomorrow, but the interviews were done by me independently and a short summary of the general trends of the interviews was shared with Tomorrow after my fieldwork was complete. All interviewees were informed about the purpose of the interview and research project and consented in participating.

The other places I did in-person fieldwork was at public events. Before attending the two training days with Cryonics UK I contacted the leader, Tim Gibson, per email. I declared my interest in attending the training as a researcher, attached the information letter I had made about my projects, and asked permission to join the training day, to which I got a short reply to please attend. At the training days I gave a brief introduction of myself and my research to the other attendees at the beginning of the day and gave more in depth explanations of my research as people approached me with questions. Since the European Biostasis Foundation's (EBF) conference I attended in Switzerland was a bigger event, I did not have the opportunity to inform all the attendees of my presence as a researcher, but the organizers, EBF and Tomorrow with Kendziorra in the lead, knew of me and my research. I told everyone I spoke with directly about my research, and word must have travelled because by the second day several people came up to me asking about my research. They all seemed pleased that I was

researching the cryopreservation community, expressing the need to know more about the people who decide to join.

I have chosen to name two of my interlocutors by full name, Emil Kendziorra and Tim Gibson, as they are publicly profiled people, often in media, and are spokespersons for the community. Other than those I have anonymised interlocutors giving only the descriptive features which I felt has been necessary in analysis.

Online ethnography is quite new to anthropology, and there have been discussions about how to be openly present as a researcher and anonymise in online ethnography. Boellstorff (2012) argues that ethical deliberations are much the same in online and offline ethnography, respecting privacy, and receiving informed consent, and, as with the more traditional forms of ethnography; to strive for as complete anonymisation as possible. At the online forums I have been part of at Discord, all new members of the forums introduce themselves when they enter. In my introductions I wrote I was doing research on cryopreservation and wanted to come into contact with cryonicists. I cannot, however, know if all people on the forum read my introductions. I have chosen to only paraphrase general themes which was written in the forums and not site anyone in particular. This is to make it harder to do searches and find the posts I am referencing and who wrote them.

Structure of the thesis

In the following 3 chapters we go on a “cryopreservation journey” in order to try to answer the who, why, and how of European cryopreservation. This journey from discovery to action, from unsure to secure, from dying to not dying, is the journey some of my interlocutors have already done and some of my interlocutors are on. In chapter 2 we discover how the ambiguities of death and secular understandings of human personhood as information opens up a possibility for not dying. Through rational thinking my interlocutors find the reasons to sign up for cryopreservation. In chapter 3 we turn to the practical aspects of setting up a cryopreservation contract and a cryopreservation business. It discusses the tech-optimistic context and investment and insurance logic it takes to plan for the long-term future. In chapter 4 the future is the focus. I look at the imaginations of my future-oriented interlocutors and the specific temporal aspects of the present which makes them seek out a possible different future life. As time is sped up and the near future is evacuated a need for control of time is expressed by cryonicists. After having ethnographically explored the who, why, and how of the

European cryonicists chapter 5 asks what type of phenomenon human cryopreservation is. The chapter discuss whether my ethnography can be seen as part of Anthropology of Religion or Anthropology of Medicine and how cryopreservation give the possibility to control life(time).

Chapter 2: The undefinable death – working boundaries and ambiguity

Death; the end of life, the last breath, the final moment. A violent end or a peaceful last breath, both very defining moments. These are perhaps the most common ways of perceiving death, in literature, in film, in general media. However, there are many ways to die, at least by definition. A person can die clinically, biologically, legally, socially, and according to some: informationally. Death can be imagined as a moment when a person's life stops instantaneously. Yet death can also be seen as a process of decay over time, i.e., aging, which can be influenced and changed.

Let us look at the definition of the most commonly used term of death: Clinical death occurs when the heart and respiration stop. Today, through the means of modern medical technologies, such as CPR, defibrillators, and heart-lung machines, clinical death is not equal to the end of life. With the technological advances of the last century, death has changed.

Brain death is now also a commonly used criteria of death. It occurs when the brain's functions stop, and heart and respiration are done by artificial life support and will stop without it. The person that once was beyond saving is not anymore with current medical knowledge. Brain death has been a disputed diagnosis in the medical community and across different cultures with different views of what constitutes a person, life, and death (Lock, 2002). Clinical death and brain death are medical diagnoses.

Legal death occurs when death is pronounced, and legal documents have been signed by the correct parties. If the circumstances of the death are suspicious, there is a legal obligation to alert authorities and the death will be investigated. Suspicious circumstances can be criminal involvement, accidents, or unattended deaths. Legal death is dependent on the laws of each country and typically involves a healthcare professional confirming physical signs of death. By German law, death can be confirmed when the first physical signs of death appear on the body. The first sign is the purple-blue colour appearing on the skin as the blood has stopped being pumped around by the heart and pools at the lowest part of the body. I was told by medical professionals at Tomorrow, that this can be seen by a medical professional 15 minutes after the last heartbeat and respiration and a few minutes more by lay people according to the German medical community. Only after the first sign shows, can death be pronounced, and legal documents signed. In the United Kingdom it is different. According to English law any competent adult can verify death, a medical doctor does not need to be

present to pronounce death. Anyone can, in theory, declare a person dead by checking the lack of vital signs, e.g., heartbeat, respiration, pupil reaction, however the deceased person's assigned doctor must sign the death certificate and have a clear understanding of the cause of death. With an uncertain cause of death an autopsy will be performed by a coroner.⁸ As most deaths happen in medical institutions where medical professionals are present, instances of a lay person declaring death are rare occurrences. By Norwegian law, a death can only be declared by a medical doctor which must see the body in person or over video. They then proceed to sign off the death certificate. The doctor must send in the cause of death to the national register of Causes of Death.⁹ The United State laws on declaration of death and legal death vary from state to state, but The Uniform Determination of Death Act which was written in 1981, to be revised this year, is a recommended legal statute of the declaration of death in the United States and is used in most states. The act is as follows;

“An individual who has sustained either (1) irreversible cessation of circulatory and respiratory functions, or (2) irreversible cessation of all functions of the entire brain, including the brain stem, is dead. A determination of death must be made in accordance with accepted medical standards.”

The suggested revision is to point (2) due to both experiences of lawsuits against deaths declared by brain death criteria and new scientific knowledge about the brain and its neurological functions. One of the suggestions is to have consent from the patient's next of kin before declaring death from neurological criteria (brain death) and organ support is stopped, but most doctors asked said they felt it was unnecessary (Lewis 2022). All the legal definitions of death presented here are based on a medical diagnosis of death which is confirmed by a medical professional and signed off on papers to be registered in government bureaucracy before the legal death is a fact.

Social death is also a concept to be considered in this context: it occurs when a member of a society is viewed as “as good as dead” without being physically dead (Králová, 2015). One can differentiate between self-perceived social death where a person views themselves as “as good as dead”, and other-perceived social death where others view a person as “as good as dead”. Social death can be used to describe the position of an individual or

⁸ British Medical Association on verification of death and death certificates
<https://www.bma.org.uk/media/2843/bma-verification-of-death-vod-july-2020.pdf> [Read 02.05.2023]

⁹Norwegian Health Department on declaration of death;
<https://www.helsedirektoratet.no/rundskriv/helsepersonelloven-med-kommentarer/meldeplikt/-36.melding-om-dodsfall> [Read 23.11.2022]

group given no place and human life value from their society, for example, a slave, an individual living in long-term institutions, or a paperless refugee. Clearly these forms of “social death” occurs on a scale and is contextually defined (a paperless clearly is not socially dead to the nearest, but to the state). Social death can occur with loss of social identity and becoming a “non-person” or “ex-person” as in the cases of long-term hospitalized patients in a psychiatric hospital, as described by Goffman. Loss of social connectedness can also contribute to social death, as in the case of a person with locked-in syndrome. Losses from body disintegration can also lead to social death where for example a dying body is treated similarly to a corpse because the existence of the person is reduced to the body (Králová 2015). Perceptions of what social death is, why it occurs and how, also varies culturally and socially, but in most places one will recognize a difference between socially dead (lack of or no social relations) and physical death. Thus: social death is not the same as social implications of the death of a person.

Informational death is used by cryonicists and others to explain death as a process, challenging the abruptness of legal death pronouncement, and explain why cryopreservation is theoretically possible. Informational death occurs when the information in the brain is unretrievable. Computer scientist and cryonicist Ralph Merkle suggested the information-theoretic criteria of death in his 1992 paper about the technical feasibility of cryonics. Merkle compares the brain to a computer’s hard drive and suggests all the information which constitutes a person lay in the atomic structure of the brain. Thus, complete informational death happens once the atoms of the brain are destroyed in such a way that they cannot be put back together, for example, if it is burnt up or completely disintegrated through rot. With an informational view of the human and its death, there is not only potential to survive clinical death, but also potential to live in other substrates than the human body such as a silicon body or digital machine. To live without your original human brain (and body) is however much debated by cryonicists; it is disputed whether or not this represents the continued life of the same person or just a new copy of the person. The different ways of defining death not only makes a difference in how the ends of life are considered, but also in what constitutes life. By changing what death is, what life is also changes.

When talking to interlocutors both in Germany and the UK about how cryopreservation changes perspectives on death, many of them pointed out the role of science, and especially advancements in medical science and technology in the last century. CPR, Cardiopulmonary resuscitation, was highlighted as technology which extends life and brings

someone back from a state that previously would be considered dead. Emil Kendziorra said he does not think there is a fundamental difference between how CPR revives a person and how cryopreservation will revive a person. “For a person of “the old-thinking”, before CPR, CPR revives a person”. Kendziorra continues; “Reviving a person from not having a heartbeat for a few minutes is not that visually different, I am not sure if it’s fundamentally something different. Well, yes it would be more graphic when we do it after 50 years”. This way of perceiving cryopreservation as the result of continuous development and advances in medical technology and science is shared among my interlocutors. They all emphasize that with the advancement in medicine the aim, above all else, is to save lives. Death is regarded to be a failure. When death occurs, medicine has failed. As my interlocutors explained; Cryopreservation is not seen as a direct solution to this failure, but as a safeguard, a place to wait out until the solution is found.

This chapter will look at the history of cold temperature preservation in western medicine building on Farman’s (2020) analyses of what he calls “the boundary work” being done to legitimise and delegitimise human cryopreservation as a medical science. Using ethnography from the EBF conference I attended I will look at how cryonicists do “boundary work”. I will then move on to Lock’s (2002) work on brain death and the ambiguity of death. Both boundary work and the ambiguity of death are evoked by cryonicists to explain the likelihood of the success of human cryopreservation. Some cryonicist have a pure informatic view of personhood, while other cryonicists have a bio-inclusive view but still see the brain as the most important part of the human. The core idea is: preservation will likely lead to continued life in the future. This perspective on death can be seen as rooted in a secular worldview where, according to Farman (2013; 2020), life without a soul renders death meaningless and the soul’s replacement with mind and matter is left in a tension between materialistic and rationalistic conceptions. I will analyse anthropologist Farman and religious scholar Modern’s (2022) theories of the secular’s impacts on perceptions of mortality and personhood. Finally, I will show how a group of young cryonicists use both materialistic and rationalistic concepts to explain their views of life, death, and personhood.

History of cold western medicine – building and maintaining boundaries

Cold temperature control has impacted human life in many ways, from food preservation and transportation to the start of life itself and might according to some change and end the end of life.

Farman (2020) traces back the principle of cold preservation of flesh to seventeenth-century philosopher and scientist Francis Bacon. Several seventeenth-century scientists were fascinated by how low temperatures seemed to have an effect on an organism's life and death and conducted experiments with frogs, fish, and produce. Quickly two problems with freezing were noted. One was the inability to produce and control low temperatures artificially. The other was damage after thawing on goods such as produce, organs, and organisms. The nineteenth-century invention of the refrigerator solved the first problem. Today cryopreserved patients are stored in dewars filled with liquid nitrogen holding a constant temperature of -196°C.

The first formal research on, and experiments with, cold temperatures' effect on biology began in the 1930s with Swiss scientist and Roman Catholic priest, Basil Luyet. Luyet wanted to study life and said he started with death since it is the destruction of life. With experiments Luyet managed to observe life being restored in some cases, introducing the concepts of "latent life" and "animation". The second problem for seventeenth-century scientists was still a problem for Luyet in his research. The cells were damaged because of ice formation during the cooling process. He never solved the problem but came up with several possible solutions; rapid cooling, dehydration, and the use of "protectants". It was the last which became the solution. During research on developing sperm preservation of fowl in 1947 in the UK, a bottle of mislabelled glycerol was used as a protectant instead of the usual fructose. The glycerol made the fowl sperm 50 % viable after thawing rather than the previous 5 % viability with the fructose. With the accidental discovery of glycerol as the first effective cryoprotectant the practice of storing and reviving cells was revolutionised (Farman 2020, 70-72). Today's cryopreservation's most advanced and least toxic cryoprotectant, M22, was developed by American cryo-research lab 21st Century Medicine, according to information I was given during fieldwork in Berlin. M22 is used in mainstream organ preservation and by Alcor, which supplies Cryonics UK. Tomorrow also works with 21st Century Medicine but has its own cryoprotectant recipe which remains undisclosed.

In the 1950s an experiment of freezing and reanimating small mammals, twenty hamsters, was conducted. They were cooled down to -5°C using glycerol as a protectant for fifty to seventy minutes before being rapidly thawed. Eight of the twenty hamsters went on to live normal life spans after the experiment. As the temperature was only -5°C and kept only for around an hour the hamsters were not frozen through and all the water in all of the cells of the hamster was not turned into ice. Experiments with lower temperatures and longer durations in frozen condition rarely led to recovered animals. It was concluded that “suspended animation”, meaning long-term storing and revival of animals, had no prospects (Farman, 2020, 73).

Since the 1950s the study of cold temperature preservation of organic matter diverges into two fields; cryobiology and cryonics. Cryobiology as a scientific field researches and develops cell and tissue preservation, for example in sperm and embryo preservation. The field of cryonics aims to preserve the whole human. The two fields had a warm relationship at first, together with the budding field of transplant surgery. However, by the 1970s cryobiology, with the Society for Cryobiology leading on, started to withdraw from collaborations and separated itself from cryonics. In 1982 the board of the Society for Cryobiology stated, “human cadaver freezing” as a practice is “devoid of scientific or social value and inconsistent with the ethical and scientific standards of the Society.” (Farman, 2020, 75). According to Farman, the cryobiologists wanted to assert their own place within science and take a stance against the non-science of cryonics with its faith, fraudulence, and death denial. Thus, cryonics is made a taboo science. Farman calls this separation of cryobiology from cryonics “boundary-maintenance” (Farman, 2020, 73-75). When I attended the European Biostasis Conference I saw some of this boundary work in operation;

Working boundaries at the EBF conference

In a quiet Swiss village, a few minutes from the Swiss-German border around 50 people were gathered at the European Biostasis Foundations (EBF) facility for cryopreservation storage and biostasis research. The annual EBF conference gathers cryopreservation experts, researchers, customers, and other interested, for a long weekend of cryopreservation discussions, workshops, and talks. The 2022 conference was held at the brand-new EBF facility, and the event marked the opening of the facility. A Tomorrow employee told me they

had spent the last few days setting up all the equipment at the facility and were not finished until late the night before.

As I entered the building by the main entrance on the first floor the smell of new a building and cleaning detergent hit me. On the left there was a big open room with glass walls on three sides, the ceiling height at least four meters. The room was filled with rows of white chairs with a screen consisting of four big tv-screens in front of the rows of chairs. The screen was filled with an image welcoming to the 2022 EBF conference. Two offices and a meeting room adjoined the big open room. Over the next hour, the room was filled up with people making introductions and catching up from their last encounter. Most of the attendees at the conference were invited speakers, EBF and Tomorrow investors, and representatives from local European cryonics/cryopreservation organisations. There were also a small number of customers of Tomorrow and a few American cryonicists (not eligible Tomorrow customers) attending. Around half of the attendees were from outside of Europe, most from North America. When most of the attendees had arrived Emil Kendziorra, chair of the EBF board (and CEO of Tomorrow), gathered people in the entryway to give a tour of the facility. He said, after giving it some thought, that he was happy for people to take photos of the facility and even post them on social media. I had previously experienced Kendziorra to take great care in what was been put out on media and social media about Tomorrow and EBF, being afraid of misuse and negative exposure, so he seemed more relaxed about it than previously.

First, we were shown the laboratory located on the first floor next to the offices. It had bench space on all walls and a big island in the middle of the room. There was a lot of new-looking lab equipment, fridges and freezers, and cabinetry on the walls. We were told the lab is going to be used to conduct research and quality control of the cryopreservations. Then we were shown down a flight of stairs. The first room we entered was a garage and workshop. This is where the ambulance will come in with the patients, Emil said. He went on to say it will also function as an engineering workshop. The workshop part was at the time confined to a workbench and some tool cabinets in a corner. Through a big blue sliding door, we were shown into the operating room equipped with a shiny steel operating table and a big white CT scanner. The room had a sharp smell of bleach. We were told this room is mostly meant to be used for research, as Tomorrow plan to do field cryopreservation in their ambulance, but it could also be a space used for the perfusion part of the cryopreservation. Through another big blue sliding door, we entered the final room of the facility, the storage room. It was a big room with a concrete floor, walls, and ceiling and even higher ceilings than the rooms

upstairs. This is to have enough space for the big metal dewars for storing the cryopreserved patients, we were told. In one corner of the room, the ceiling height was doubled and there was a crane system attached to the wall. This is where patients will be hoisted into the dewars, we were told. The room was mostly empty except for one dewar and a cool-down box. The cool-down box was designed and built by the engineering team at Tomorrow and will be used to cool patients down from a few degrees minus Celsius to the minus 196 degrees Celsius temperature of the liquid nitrogen in the storage dewars. There was a lot of excitement from the crowd about the cool-down box as it was a new version made from scratch by Tomorrow's engineering team. After Kendziorra had introduced the last room we all walked around in the three downstairs rooms inspecting it in detail. Throughout the tour, people had their smartphones and cameras out taking lots of photos and videos. There was an excited hum as people looked around in the storage room, talking about how great the new facility was. At one point, Kendziorra and Max Moore, former CEO of American cryonics provider Alcor, standing in front of the cool down box talking about its design, became a popular photo-motive. The interior for the dewars were laid out on the floor and a tall Dutch man, part of the Dutch cryonics' organisation, laid down on the floor next to it to check if he would fit. He just about fit, with his height of 2 meters, and said the dewars were "Dutch prove".



Figure 3 EBF facility. Front room set up for conference; The lab; A cryopreservation dewar; operation room.



Figure 4: The "Dutch prove" dewar interior; the cooldown box.

After having looked around in the downstairs rooms freely for about twenty minutes we were called back upstairs to start some workshop discussions. There were two workshop topics presented by Kendziorra who also invited people to take up other topics. The first was local standby collaboration in Europe. Tomorrow have initiated a suggested collaboration with existing local cryopreservation organisations across Europe, e.g., Sweden, Finland, Spain, France, and Italy. In these regions, there are, currently, no cryopreservation training or equipment to help train them and get equipment to do “cryopreservation first aid”. This “first aid” entails doing the first steps of the cryopreservation procedure, the stabilisation, on local patients, which are extremely important for a successful cryopreservation process. Training of local teams is therefore necessary as it will take some time for Tomorrow’s professional standby team to arrive. These local teams would also have local knowledge of and contact with legal and medical experts with necessary expertise on the local death procedures (as the legal and medical procedures around death varies from country to country). There seemed to be some interest from the local organisations from Sweden and Spain.

The second topic was brain-only preservation. Currently two versions of cryopreservation are done: whole body and neuro preservation (I will return to the difference later in the chapter). EBF and the new American research lab Biostasis Technologies presented a new research project on preservation of brains. Biostasis Technologies is led by Aschwin de Wolf, founder of several cryopreservation and biostasis organisation in the last decade and a leading figure in the current cryopreservation and biostasis research field. By researching the viability of preserving brains in a fixation of aldehyde, preserving with a chemical instead of cold temperatures, they hope to find a viable alternative to cryopreservation. The main reason for this, Kendziorra said, was the need for a low-cost alternative to current prices of cryopreservation as “cost is one of the main factors holding people back”. With a rough estimate of 9 500 euros for a brain preservation in chemical fixation against the 200 000 euros for a whole-body cryopreservation and 60 000 euros for a neuro cryopreservation, it would be a lot more affordable to many people said Kendziorra. Another positive thing about brain preservation according to Kendziorra is that it is already being done in medical research, pointing to a brain bank which stores brain tissue in Germany.¹⁰ Others in the audience agreed with Kendziorra, saying; as it is already an existing

¹⁰DZNE Brain Bank:<https://www.dzne.de/en/research/brain-bank/> [23.05.2023]

practice in medicine it would maybe be easier for outsiders to understand and see it as medical science with legitimacy. The brain-only preservation suggestion also started a discussion on personhood and identity and whether it all lies in the brain or if the rest of the body also is part of personhood and identity. Some called themselves “bio-inclusive”, the body had to be included in the preservation and revival, and it needed to be the same matter which was revived for it to be the same person being revived. Some said they did not see problems with neuro preservation and continuing life in a synthetic body. Kendziorra said he believes all other functions can be synthetically replicated except the brain’s function. The discussion ended with one prominent cryopreservation researcher stating they thought these “philosophical” matters were not for “us scientists” to discuss or focus on.

The second day of the conference was filled with talks. The speakers ranged from cryopreservation experts, leaders of cryopreservation organisations and communities talking about the newest developments, computer scientists working on AI-related to aging and cryopreservation, and biotechnology researchers specialised in aging. There were several cryobiologists giving talks about their research. Some of the cryobiologists were from labs that had been doing research in collaboration with, and funded by, cryopreservation organisations. One of the cryobiologists did not have such a link and did not mention the preservation of a whole human but of human organs. As new cryopreservation organisations, Tomorrow and its sister organisation EBF, are understanding and presenting themselves in medical and scientific terms. They are working towards a shift in the boundaries that have long divided cryobiology from cryonics and human cryopreservation. Using the words cryopreservation and biostasis instead of cryonics is one way they challenge this boundary. Inviting cryobiologists to their conference and collaborating on research with them is another way. The want and need to be taken seriously by the medical field and the general public. Manifesting cryopreservation as a legitimate medical and scientific endeavour was discussed by many at the EBF conference. Establishing themselves on “the right” side of the border between science and “pseudoscience” is of extreme importance for those working in the field of human cryopreservation. Acceptance as “scientific” is seen as key to gain recognition and more attention from the general public which again cryonicists think will give growth and a quicker development of the field. I will return to this later in the chapter.

On the last day of the conference, there was an open house event at the facility. The local community with representatives from the municipality and local journalists had been invited. After an article about the facility appeared in the local newspaper a few months

before, there had been increasing scepticism towards EBF and what would be going on at the facility. The open house day was meant to de-mystify the facility and practice of cryopreservation and be a place for the local community to meet with the cryopreservation community, said Kendziorra. On the first day of the conference when going through the program, Kendziorra told people “to tone it down” on the open house day to not scare away the locals. After spending two days at the conference hearing lengthy discussions of the technical aspects of the cryopreservation procedure, in plain and detailed language, death being openly joked about frequently, debates on where identity is located; the brain or body, and joking about how to lure loved ones into signing up for cryopreservation, I could understand Kendziorra felt the need to give them a disclaimer. I, unfortunately, had to leave the morning of the open house but was told by other attendees it seemed like a successful day with a good turnout of people and no loud debates.

Working on the boundaries, or rather: challenging the boundaries, between cryopreservation and the science and medical fields, is important for cryonicists in order to be seen by the general public as a legitimate scientific area. It is thus also important for cryonicists, to rid themselves of anything that can give associations to the speculative and the religious. Before we take a closer look at the boundary-work in relation to secular traditions, let us look closer at the key organ for many cryonicists: the brain. Let us see how the ambiguity of death, brain, and personhood create possibilities for changing perceptions of death.

Organ transplantation reworking death – the ambiguous brain dead

Farman (2020) compares cryopreservation to organ transplantation and points to how the field of cryonics needs to overcome many of the same scientific, medical, and cultural processes which the organ transplantation field has successfully achieved. These processes concern everything from the general redefinition of death to the specifics of cryopreservation and transportation of organs, says Farman. As Margaret Lock shows (2002) this process is long and needs to work with and overcome ambiguities around death as a medical diagnosis. According to Farman (2020, 132), modern medical institutions and technologies blur the boundaries between life and death because they tend to push life to its end and not accommodate death.

Lock (2002) writes about a specific case in point: the medical diagnoses of brain death and how it has developed and is being used in North America and Japan in relation to organ transplants. Lock explores the different assumptions about the end of human life and how they are associated with brain death to shed light on how societies approach social and moral issues associated with emerging biotechnologies. The technology and expertise are the same in both locations (North America and Japan) and derive from a shared history of recent medical innovation but play out differently in the respective cultures. Death is universal but its meaning is not. Death cannot be pinned down, it is ambiguous and uncontrollable, argues Lock (2002, 377).

In North America discussions about definitions of brain death have been limited to a small group of professionals; doctors, lawyers, and intellectuals. Organ transplants have mostly been written about in positive terms in the media in North America. Procurement of organs and assessment of brain death has rarely been discussed in mainstream North American media. In Japan, however, Lock found there have been public debate and public mistrust in medical professionals' procurement of organs through shortening a person's life with the use of brain death as a diagnosis.

It was not until the development of critical care medicine and new medical technologies such as the aforementioned CPR, artificial respiration-support machines, and organ transplant, a new uniform, objective, and effective definition of death was needed, argues Lock. She shows how in North America and most of Europe institutionalisation and legitimisation of brain death as the end of human life followed two lines of thought:

The first line of thought seeks to assign death to a verifiable and scientifically deducible moment, thus being indisputable in medicine and recognisable in law. Such a universal consensus does not exist, and criteria for pronouncing death differ in legal terms from country to country. As Tomorrow operate across European countries it was on several occasions brought up how they would have to deal with different legal definitions of death and how some were quicker and therefore better than others. Starting the cooling down-process of the patients as soon as possible is seen as crucial in cryopreservation. The German legal definition of death was talked about as "annoying" by Tomorrow's medical professionals. As I briefly mentioned in the introduction to this chapter, by German law death can only be pronounced when the first signs of death are visible on the body. A doctor can, by law, detect them after fifteen minutes of no respiration or heartbeat. At the Cryonics UK trainings I was told that since, in the UK, anyone can pronounce a person dead as long as the

doctor in charge of their care approves and signs the official papers, when no vital signs, i.e. pulse, breathing, and pupil function, are found, the cryopreservation procedure can commence right after the patient's heart stops.

The second line of thought comes from philosophers and bioethics. Lock explains how pronouncement of death can be made when, due to irreversible damage in the upper brain, there is no possibility for cognitive function in an individual and the person no longer have any individual interests. These patients are “good-as-dead” because they will never recover consciousness but will not be defined as brain dead by all medical professionals and do not have legal recognition as dead in North America (Lock, 2020, 7-8).

None of these lines of thought fit with the Japanese assumptions about the end of human life, according to Lock. As dying is understood as a process, both doctors and laypeople have rejected the attempt to isolate death to a moment. In Japan death represents not the end of an individual body but is foremost a familial and social occasion. Death, even in medical settings, only becomes final when the family has accepted it (Lock, 2020, 8). In the context of Japan, death is, to a greater degree, socially decided one might say. Death is here not a specific moment defined by the medical profession.

The cryonicists as well reject the idea of death as a momentary phenomenon. They emphasise that the fact that death is a process is exactly why cryopreservation patients can be revived with their personhood intact. Following an informatic view of death, many cryonicists have stated that the brain structure remains intact enough to preserve what constitutes personhood for many hours after the last respiration and heartbeat. According to a moderator at the biggest cryonic-related online forum, the Discord- server Cryosphere, which I met at the EBF conference, brain versus biology is one of the main debates among cryonicist. Some say the brain is key and all you need in order to revive a person in the future. Others say the rest of the body matters too, like the gut biome and sensory system. I have spoken to cryonicists with both views. However, they all point out that the brain is the most important to preserve well and with future technoscientific developments all the other functions of the body and biology of the human can with all likelihood be done synthetically. Several cryonicists say getting the whole body preserved is a way to have everything covered just in case something outside the brain does impact personhood. Hence, personhood is still being centred in the brain and its neural structures by cryonicists choosing whole-body preservation.

The death of information and personhood – locating the person in the brain

The information-theoretic criteria of death are as I stated in the beginning of the chapter the perception cryonicists have about death. Following this definition of death, a person is dead if all memories and personality have been destroyed in an information theoretical sense. That is a computer-based theory of information. One of the main proponents of the informatic view of death whom I briefly introduced above, Merkle (1992), compares unreplaceable damage in the brain to a computer. He talks about what would need to be done to the brain to do unreplaceable damage, if it is burned, also called cremated. His view of the human is materialistic, reducing the human and its brain to the atoms it consists of and the structure of the atoms. If the structure of the matter we consist of can be mapped, then it can also be replicated, argues Merkle. He continues to say that because it is extremely difficult to damage the atoms of the brain to something that cannot be set back into a healthy structure, and what is considered personality and memories are located in those structures, cryonics is possible. Using nanotechnology Merkle claims the brain's informational patterns can be mapped out and then repaired or replicated after cryopreservation (Merkle, 1992). The newly published book *Cryostasis Revival: The Recovery of Cryonics Patients through Nanomedicine* written by nanotechnologist Robert A. Freitas Jr. explores different restorative methods using medical nanobots to collect information in the cryopreserved tissue, compute how to fix damage tissue, and implement repairs (Freitas Jr., 2022). Farman (2020, 4) points out how the informational-theory view not only affects death but also the concept of what we are as humans. Humans become information-beings or informatic selves to be cultivated, preserved, extended, and edited.

Speaking with cryonicists and reading debates on online forums and blogs¹¹ between cryonicists I observed different views on the brain, personhood, and humans as informatic beings. Some say preserving just the brain and then either being uploaded to a machine in the future or getting a completely new synthetic body, the way it was described by Merkle, will not be a continuation of the person they are today. An uploaded mind will be a copy of them and not actually them. However, as previously mentioned the brain is still emphasised as the most important organ to preserve well. Most people I spoke with did not have a very detailed idea of how personhood is located in the brain, just that it probably is.

¹¹ From Discord, LessWrong.com, WaitButWhy.com, and Tomorrow.bio

This question also ties in with whether to choose to preserve just the brain, the brain and upper part of the spine (neuro preservation), or the whole body. During my fieldwork Tomorrow only offered whole-body preservation. When I first came to Tomorrow there were no talks about also offering neuro-preservation as American Alcor and CI does. Speaking to CEO Kendziorra about this, it was pointed out that neuro/brain preservation is something Tomorrow might start with if the methods of doing so, are researched more and seem promising. It is also interesting to note that the main reason given by Kendziorra for developing brain preservation methods was having a cheaper alternative to whole-body and neuro-preservation. This is to make cryopreservation more affordable for more people. The current price for whole body preservation at Tomorrow is 200 000 euros, and the American cryonics company Alcor currently charges around 80 000 dollars for neuro preservations. Six months after this conversation Kendziorra presented, at the EBF conference, the research initiative between EBF and American cryo-lab Biostasis Technologies into brain preservation using chemical fixation instead of cold temperature and cryoprotectants to preserve the brain. According to Kendziorra, when asked about price after presenting the research initiative, a brain-only preservation in chemical fixation (instead of cryopreservation in liquid nitrogen) could cost around 9 500 euros. As of March 2023 brain-only cryopreservation is an option at Tomorrow at the price of 60 000 euros. The next chapter will look further into the financial aspects of cryopreservation.

Cryonics UK do procedures both for the patients who are signed up for neuro and whole-body preservation, but the perfusion with cryoprotectants is done of the brain only and not the whole body in all cases. This is because they perfuse through the jugular veins in the neck, whereas Tomorrow currently plans to use a method of perfusing the whole body through the heart. Cryonics UK just perfuses the brain with cryoprotectants. Leader Gibson said that this comes down to practicalities and ease, what actually works when perfusing. During the trainings I attended with Cryonics UK there was not much discussion about brain/neuro versus whole-body preservation, but a few people said they had contracts for neuro-preservation. According to Gibson, they discuss the philosophy behind cryonics at meetings many years ago, but now they focus on practical training. Gibson seemed to have little interest in the “philosophy” as he called it and shrugged at my interest in finding out cryonicists’ motivations for getting cryopreserved.

Even though not all cryonicists agree that computer-like information in the brain is all that makeup personhood, they do agree on that the material of the body and the brain does

make up a human and its personhood (and not, for instance; a soul or a spirit). This materialistic view is needed to argue that cryopreserving will continue life. It is a simple logical conclusion for cryonicist that preserving the brain before it ceases to exist might make it possible for it to exist again. Cryonicists emphasise it is a logical conclusion and not a belief. Belief is for them something muddled with religion. Breaking through the border between cryobiology and human cryopreservation is extremely important for cryonicists because it will remove them from the realm of religion: from those other people and institutions who strive for indefinite life, and/or immortality.

A quick note on the I-word: Immortality. It is an iffy term to most cryonicists. It is full of religious associations, and thus not a word they like to use, as it gives associations to a realm they strive to be separated from. A well-known cryonicist told me he did not like immortality being used about cryopreservation as it is not really what they want to achieve. Cryopreservation and other longevity ventures is about having the freedom to live as long as you want, he told me. “Chosen lifespan is a better term for it.” Some cryonicists I spoke to envisioned indefinite life, but most said they just wanted to live longer, not necessarily forever. This will be discussed more in-dept in chapter 4.

Now let us take a closer look at the removal of religion in the emergence of secular traditions of the last centuries and how cryonicists are embedded in these secular traditions.

Death in the secular –from soul and spirit to mind and matter

None of my interlocutors call themselves religious, most said they are atheists, some agnostics. Distinguishing themselves from religion and the concept of belief is something all but a couple of cryonicist I have met have done. They say they follow science and technology, not the unproven and superstition religion preaches. They often call themselves secular, but what is the secular, and how does cryonicist draw on the secular perceptions of death?

Farman (2013; 2020) has described a secular tradition in which materialism and rationalism are invoked by different institutions to define the secular person, its life and death (and lack of an afterlife). As a student of Talal Asad, Farman builds his arguments about the secular and secularism on Asad’s work, who argues *The secular* is the underlying political doctrine of *secularism*. Asad advocates for the use of *secularism* as a concept of comparative analysis of human life and society across space and time. Using binaries such as belief and

knowledge, reason and imagination, and natural and supernatural, Asad discusses the shift in concepts which constitute the secular (Asad 2003). Farman differentiates between the *secular* and *secularism*, explaining the first as the separation of the church and the State, and the second a cosmology based on evidence-based science without the supernatural. Taking a different approach to secularism than it being in the shadow of religion, Farman, argues that the secular in the West is a distinct formation identifiable by specific traditions. The religious also influences the secular, but Farman says he is interested in how new selves, assumptions, problems, and dynamics are developed within the secular and can partly be examined on their own terms.

“Even without religion, the rules and problematics of a science, philosophy, or politics of mind would continue, though they took their shape in large part through a process of the secularization of the soul. Indeed, the problem of the mind is one of the key markers of the secular, which in the United States surfaces clearly around conflicts over personhood and death.” (Farman, 2013, 739)

Farman (2013, 2020) focuses on the United States but includes the rest of North America and Europe in his analysis of the secular. The secularisation of the *soul* turns the soul into the secular term *mind*, further developed in psychological theory during the 20th century, he argues. But the mind includes elements, such as the experience of consciousness, free will, subjective feeling, etc., which are hard to explain in bioscience. Farman argues that there is a tension between the medical body and personhood defined materially on the one hand and the politico-judicial body and personhood defined in rationalism on the other. In terms of the latter, the secular person is self-contained, sovereign, and autonomous with reason, self-awareness, and subjective feelings. The description is non-material but based on rational concepts, says Farman (2013). In medical and scientific terms, the human being is biology. Farman argues that the relationship between person, life, and death is established in the biological or material body and stabilised through the secular authority of the medico-legal regime in the public imaginary (Farman, 2013, 753).

This imaginary leaves no room for concepts of the immaterial, and thus also, no rich imaginaries of afterlives. Secularism as a tradition, produces a specific material view of the person, argues Farman, and he says cryonics in many ways conforms to this. However, cryonics also challenge and confront secular law, science, and medicine. For cryonicists secular institutions are conservative. Cryonicists want to proceed to the next step, we might say; the next logical step: to not die. The brain and informational-centric view of the person

shared by most cryonicists would, according to Farman's distinction, be a materialist view of personhood. It is in the matter of the brain that personhood is located and if this matter is preserved and revived without damage, the person can continue. Death is avoided by continuing the mind, not by believing in the afterlife of a soul. It is the mind, as it is scientifically perceived, which can be preserved, both with and without the body. With the importance of the brain as information and material in mind, let us now take a closer look at the brain as an information processing device and place of material and metaphysical truths.

The neuromatic brain

Cryonicists are not alone in having an informatic view of the brain and personhood. According to religious scholar John Lardas Modern (2021) the brain is increasingly materialising as an information processing device in today's society. Modern calls this view of the materialised brain "neuromatic". Tracing back to the sixteenth-century scientists' ideas of the brain emerging after the Protestant reformation, Modern says the theorising of cognition as a systematic phenomenon has become increasingly accepted especially in the last decades with increasing technological advancement. After the development of technology to measure and image brain activity, it was not only neuroscience which used the technology. Psychology and religious science also picked up the new technology to try and understand and measure the human minds inner workings and perceptions of the world and locating it in the brain. The neuromatic brain is systemised into connections of different parts and locations with different corresponding actions. Because of the information processing, the neuromatic brain is more than something material, according to Modern. It is interacting with the environment and corresponding with itself and the world around it. He argues neuroscientific professions have been powerful in the creation of the secular order, as they are not bound to the history of "religion" in their authority. However, they also produce particular forms of religion. The brain replaces God in being a resource for talking about true and everlasting things, argues Modern. Calling the brain a totem and referencing Durkheim, Modern argues "[...], the brain is the tangible representation of an intangible system of ideas that feeds and regulates practices that feed and regulate ideas that feed and regulate practices." (Modern, 2021, 375).

The materialist and mechanical view of the brain as an information-processing device fit quite well with Merkle's information-theoretic criterion of death and the neuro-centric arguments cryonicists give for the feasibility of cryopreservation. The brain is a machine-like

entity which can be awoken again if all the components are intact. In cryopreservation the brain is always described as the most important to preserve well. The brain is where the mind is and the mind is what makes up a person, what needs to continue for life to continue. Speaking to cryonicists about whole-body versus brain/neuro-preservation, the people opting for whole-body say they do it to have all possibilities covered, but they do not oppose brain/neuro-preservation. As shown cryonicists have a secularized view of the mind and personhood which is derived from modern science traditions.

Online forums for rational cryonicists

Scientific thinking and what they described as rational thought and reasoning is important for my interlocutors view of life, death, and personhood. But what is this rational thought they refer to? It might seem paradoxical that they on the one hand are so eager to be taken seriously in scientific and medical terms, but on the other is honest about the lack of revival technics. The latter seem to involve a form of speculative activity; offering to freeze in the hope, and belief, that they will be able to reanimate them. The argument for accepting this, that I have been given by many interlocutors, is the following; “You would just be dead anyway”. There is no worse alternative, no potential damage being done, as the result if it fails is death which also happens if nothing is done. When discussing death with a cryonicist the rationality and logic of arguments such as the one above is often explicitly mentioned. Cryopreservation is given as a logical solution to dealing with (not) dying.

Many of my younger interlocutors call themselves rationalists and reference the online forum LessWrong and its founder Eliezer Yudkowsky. In his posts about cryonics on LessWrong, Yudkowsky presents the brain as a computer hard drive on which it is almost impossible to delete all information. He uses the same arguments as Merkle and the information-theoretic criteria for death, but he does not reference it directly. The argument of what if the future is bad and not worth living in, is countered by Yudkowsky by referencing progress and how today is better than the Middle Ages. Yudkowsky responds to the argument of cryonics being selfish by saying most cryonicists want cryonics for all people, not just themselves. “Cryonicists are people who've decided that their deaths, and the deaths of their

friends and family and the rest of the human species, are not part of the plan”, writes Yudkowsky. Ending one of his posts with not I want to live, but “I want you to live”.¹²

The article “Why Cryonics Makes Sense” by Tim Urban on the blog WaitButWhy was also given by several of my interlocutors as their inspiration to sign up to be cryopreserved. On my first day at the Tomorrow office, I was given the article to read and told it was a really good explanation of what cryonics is and why it is a good thing. In conversations with cryonicists, the article often came up when talking about their first encounter with cryonics and what made them realise it was something they could do. The article presents a sentence filled with common misconceptions about cryonics;

“Cryonics, or cryogenics, is the morbid process of freezing rich, dead people who can’t accept the concept of death, in the hopes that people from the future will be able to bring them back to life, and the community of hard-core cryonics people might also be a Scientology-like cult.”

Then Urban uses rational arguments and detailed descriptions of the cryonics process, from sign-up to potential revival to debunk the misconceptions. He argues death can be seen as a process and not a moment, and points to the important difference between legal death and informational death. He argues that with progress the future will likely be better and solve current unanswered questions in cryonics. By the end of the article the sentence about cryonics has become; “Cryonics is the process of pausing people in critical condition who can’t accept the concept of death, in the hopes that people from the future will be able to save them.” Then Urban compares cryonics with experimental medical treatment as the one chance to continue living, to get rid of the part of the sentence about not accepting death. “Because it’s worth a try. Because it just might work.”¹³ In conversations with interlocutors, they often continue this line of thought with “and if it doesn’t work, I am just dead and would never know the difference.” They said it in a neutral tone, as it was just a matter of fact, a logical conclusion.

The secular death is without a soul, the ceased mind, and a final end. As there is no afterlife death become meaningless and life should be filled to the fullest with meaning. Cryonicists have a materialistic view of the human, with the brain as filled with information which makes up personhood. This information does not necessarily cease to exist upon legal

¹² Read at <https://www.lesswrong.com/posts/yKXKcyoBzWtECzXrE/you-only-live-twice> [03.11.2022]

¹³ Read at: <https://waitbutwhy.com/2016/03/cryonics.html> [03.11.2022]

and initial biological death and if dealt with correctly the information can be preserved and re-found with future technology according to cryonicists.

Summing up: cryonicist use materialism to explain how cryopreservation (probably) will work, and they use rationalism to explain why cryopreservation should be used. It is the free choice of living, living as long as you want, without the hindrance of death.

“You don’t have to die!”

We have now looked at why cryonicists find cryopreservation to be the only currently available option for not dying. This rational conclusion cryonicist draw from several science-based ways of reasoning. First, and most important: the possibilities which are opened by the effect of cold temperatures delay of death, or even bringing the process of dying to a standstill. Second, understanding death in informatic terms. Information in the brain is like information in a computer, which can be retrieved, revived and replicated. Third; there is the process of death, which cannot be isolated to a moment. Therefore; “You don’t have to die!” as one of my interlocutors put it. Because you don’t have to die you can choose how long to live, and my interlocutors want to live longer. Cryopreservation can give them the opportunity to live longer, as long as they want, and have a chosen lifespan. All the cryonicists I spoke with say they know cryopreservation might not work, but the alternative is just death, which they see as ceasing to exist, as nothingness.

It is in the context of the secular ambiguity of personhood and death that the practice and idea of cryopreservation is born. When the soul and afterlife are no more and are replaced with the mind, death becomes meaningless. In the context of the secular, western medicine death becomes a failure and something to avoid as long as possible, maybe even conquer. Cryopreservation offers a possible solution, a potential for not dying. Arranging the potential for not dying requires investments and insurance which we will take a look at in the next chapter.

Chapter 3: Managing cryopreservation – organisational, financial, and legal aspects of cryopreservation

This chapter looks at the organisational structure of Tomorrow and how its customers arrange their cryopreservation through the steps of the sign-up process. Cryonicists use life insurance policies to fund their preservation and Romain (2010a) has shown how cryonics in an American context becomes an investment in the frames of neo-liberalist ideas, where the return on the investment is not money, but time. Even though, some of the insurance logic Romain shows can be found among the European cryonicist I have met, there is also a different contextual background at work; namely the ideas of the 4th industrial revolution and the economic climate favouring innovation and tech-optimism which the biotech start-up company Tomorrow is a part of. I begin the chapter by looking at Tomorrow's organisational model. Then I move on to Romain's study of investment among American cryonicists, before looking at the cryopreservation sign-up process my interlocutors went through and comparing the financial aspects with Romain's theory. Thereafter I explain ideas and visions of what is called the 4th industrial revolution, its ties with transhumanism and how it influences a broader trend of tech-optimism and innovation in the current economic climate. The chapter ends by looking at some of the legal challenges cryonicists face, as the practice of human cryopreservation is not yet described in any legal texts. Overall, this chapter explores the broader financial and economic frames from which the idea, and the practice of cryopreservation, develop.

An organisational model for long term stability

To ensure long-term economic and organisational stability, cryopreservation providers use a business model of separating different parts of the cryopreservation into different companies and foundations. Initially, Tomorrow's founder Emil Kendziorra planned to only work with the non-profit EBF. EBF was founded in mid-2019, but when hunting for donations to the foundation Kendziorra found many potential donators to be more interested in a company they could invest in and was told; "If I donate money it is just gone, I don't feel part of this thing [EBF]." As he saw the need for a company for people to invest in, he established Tomorrow. According to Kendziorra investors have very little say in the running of the company, as he and his co-founder owns 88% of the company shares. He also said there

generally are three types of investors in Tomorrow; People who want to be cryopreserved and search for the best possible company to do so, people who are not sure about cryopreservation but want to have a chance of being part of a long term future, and people who want to invest in a “cool thing” but are not necessarily themselves interested in getting cryopreserved. At the EBF conference, I met one of the recent investors of Tomorrow, a Spanish businessman. At the end of the conference, I asked him if he was happy with his investment after what he had seen at the conference. He said he was and that it was an “investment of the heart, not the head”. He said that he wanted to be cryopreserved himself, and did not expect a monetary return on his investment. There is also a small group who think cryopreservation might turn a big profit in the future, but Kendziorra told me that he always informs potential investors that profits from the company will mostly be put into research and not paid out to investors.

In the beginning, Tomorrow was owned by EBF but was quickly separated into its own entity. The connection between Tomorrow and EBF today is Emil Kendziorra, who is CEO of the first and chair of the board of the second, and the fact that they are dependent on each other. Tomorrow needs EBF to store patients and EBF needs Tomorrow to bring in new patients and the money from Tomorrow patients to maintain the upkeep of the facility. The money Tomorrow patients pay is not channelled directly to EBF, but to a separate foundation, the Tomorrow Patient Foundation (TPF). TPF’s role is to be the legal guardian of the patients and take care of money paid in by each patient to maintain their suspension and pay for revival. Patients pay more than the actual cost of cryopreservation and these funds are kept by the TPF and invested at low-risk inflation rates. The interest of the investment is taken out and used for the upkeep of the EBF facility.

In an interview with Kendziorra, he drew up a model showing the three different organisational units and their corresponding functions. The drawing showed three separate boxes, one for each of the organisational units, from left to right: Tomorrow, EBF, and Patient Care Trust (TPF). Kendziorra then added each of their corresponding functions as he talked about them, and then drew lines between the boxes of Tomorrow and EBF to show their dependence on each other. No line was drawn between the TPF box and the other two boxes. Tomorrow does the operative tasks, marketing, contracts, and medical (the cryopreservation procedure). EBF is responsible for storage and research. TPF is the legal guardian of the patients and takes care of their money. The logic behind this separation is to create the best possible long-term stability where it is most needed, said Kendziorra. The TPF is the most protected and stable of the three, which is important in order to take care of the suspended

patients for (probably a very) long time. EBF, because it is a non-profit organisation, creates stability for the storage part of the cryopreservation. Tomorrow can thus be less stable as Kendziorra explained; “If Tomorrow gets attacked [for instance sued] and goes out of business I will just found Tomorrow 2.0. Nothing will happen to the patients, and nothing will happen to the money of the patients.” US cryopreservation provider Alcor has a very similar model, but the storage and contracts are under the same company. Kendziorra said he would never put those two services together as lawsuits against the company would possibly effect the stored patients. Though he did follow up by saying “To be fair, Alcor has been stable for many years.”

Investing in a future life – Time is money

Tiffany Romain (2010a) studied cryonics in the United States in the early 2000s, where she did fieldwork at Alcor and Cryonics Institute, and describes relations between cryonics and associated values within neoliberal capitalism. Cryonics runs on an investment logic; it is an investment in possible future life and potential insurance policy against death, Romain argues. “Cryonics demonstrates a unique way in which time, capital, and biotechnoscience can come together in the name of future life.” (Romain, 2010a, 196). For the libertarian American cryonicists Romain describes in her work, cryonics is, she argues, an exercise in the Foucauldian “right of the social body to ensure, maintain, or develop its life” (Romain 2010a, 201). Cryonics is an investment in one’s own future and depends on hopes of certain future outcomes, i.e. revival, says Romain. However, she continues, unlike in other investment ventures, such as retirement funds, college education, and insurance policies on property, investment in cryonics does not return financial security, but time. “Time is money”, first penned by Benjamin Franklin, is a key to (American) capitalism and gains new meaning in cryonics, argues Romain. As time itself is sold on the free market and consumers are “buying time”, as Romain argues, cryonicists invest in the long-term possibility of return in extended life time.

Romain calls cryonics both a consumer service and a grassroot movement (2010a, 204), which is something I recognise from my own field. Where Cryonics UK had the feel of a grassroot group, people doing cryopreservation for each other, but still it was a paid-for service with a “customer”, Tomorrow was seemingly much more consumer-oriented. Tomorrow is a business selling cryopreservation services, yet they also see themselves as

dependent upon locally organised groups to offer cryopreservation in the outskirts of Europe. This is reflected in, Kendziorra's initiatives to train and equip local groups to do standby and stabilisation on local cryopreservation cases. Cryopreservation is an individual service yet needs a community to function as one of Romain's interlocutors said "You can't freeze yourself" (Romain, 2010a, 204).

Romain argues neoliberal cultural framework fits with cryonics (in the US). Through cryonics, people plan and save for the future in material and corporal objects, and this is done by individuals helping themselves through what they see as a progressive and efficient free market rather than the government. Cryonics is a capitalist form similar to other insurance and speculative investment types. Consumers buy into an imagined utopian future and an abundance of time. This is something only a privileged few can afford and even fewer consider purchasing, according to Romain. Romain also calls cryonics a "uniquely American strategy for transcending the limits of life." (2010a,205). I have however found much of the same thinking among my European interlocutors. Maybe one can call it a Western strategy, in the context of globalisation and online sharing of ideas (most of my interlocutors say they found out about cryonics/cryopreservation somewhere on the internet). However, very few of my interlocutors self-identified as libertarians, which is different from Romain's description of American cryonicists. My interlocutors see cryopreservation as an individualist choice and go to the free market to get their cryopreservation (which is in line with libertarianism) but there is not an (explicit) fate in the free market in the same way Romain describes her interlocutors. Let us take a look at Tomorrow sign-up process and how the European cryonicists I spoke with in 2022 managed their cryopreservation sign-up.

Marketing cryopreservation

As Tomorrow is a new start-up company, they have to build up a customer base, and in doing so marketing has been at the forefront of the company's priorities. In order to increase customers who, want to sign up for cryopreservation, and Tomorrow is ambitious in this respect, they need marketing strategies that will work. Marketing has therefore been a substantial and important part of the company's focus in its first couple of years. Ads on Google have been important. Google searches for *Cryonics* or *Cryopreservation* in the spring 2022, for instance, would immediately display a link for Tomorrow's website. Social media, as well, has been important for showing both ads and own-produced content on company

profiles. The goal has been to have a high outreach and exponential customer growth every month. During my time at Tomorrow's office in the Spring of 2022, almost half of the employees worked on marketing. Tomorrow has also made an effort to have information available in different European languages, namely English, German, French, Spanish, and Italian. The website and blog are also important tools to draw in customers and give the general public information about cryopreservation with a positive angle. Blog posts were written about the science behind cryopreservation, debunking of cryopreservation myths, and how cryopreservation is depicted in movies, tv-series, and literature, to mention some topics. Tomorrow also set up and moderated a Discord server for their members and others interested in cryopreservation. Here people could ask questions which Tomorrow's employees could answer directly. Tomorrow often shared the latest blog posts and news updates on this site, and people could discuss all different aspects of cryopreservation as well as other topics that interested them. Recently, Tomorrow's Discord server has merged with a bigger Discord server about cryopreservation, The Cryosphere. It was set up and moderated by Americans but has members from all over the world, though mostly North Americans and Europeans. Instagram and Twitter are also used by Tomorrow, but mostly to post updates on the blog and website and news from Tomorrow. A few YouTube videos were also made at the time I was with Tomorrow and plans for a monthly series of livestreams were made. Two livestreams were held, and the YouTube videos got a few views averaging between 90 and 200. During the winter of 2022/2023 there was a big decline in Tomorrow's postings on their blog and social media. As of April 2023 posts have picked up again and a new series of YouTube livestreams have been presented. The main challenge for recruiting customers, according to Kendziorra is: "How can we explain this topic [cryopreservation] so people better understand it?" Kendziorra called it one of the main tasks of Tomorrow in addition to the development of the medical method of the cryopreservation procedure.

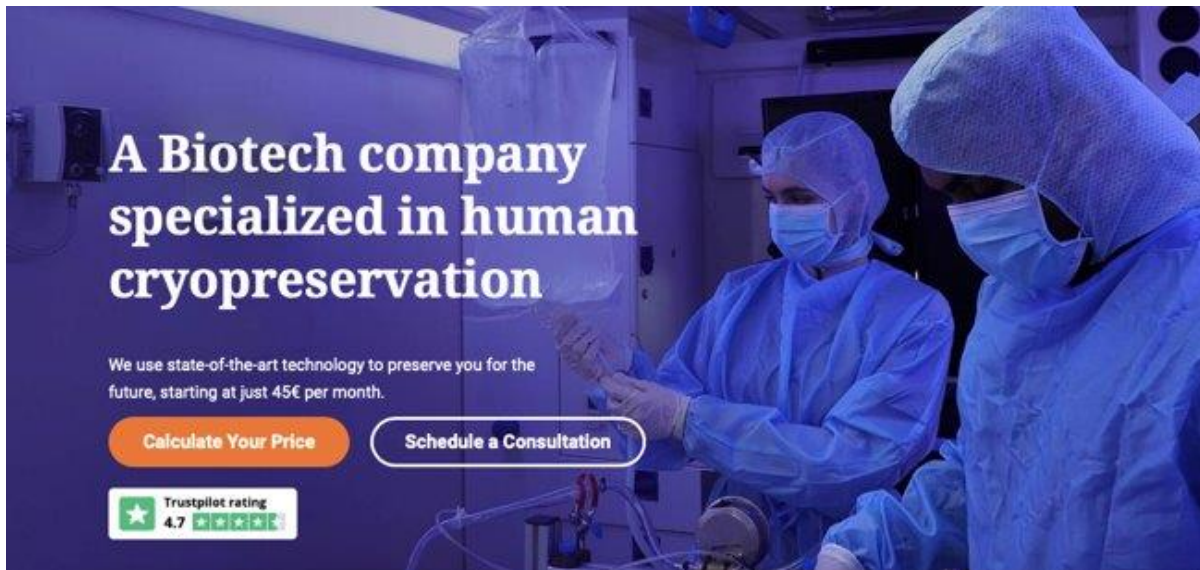


Figure 5: Headline on Tomorrow Biostasis website [29.01.2023]

Filling out the paperwork

Signing up for cryopreservation can be done in a few days, but for most of the cryonicists I spoke with, this is not an easy decision and often involved a lengthy process. Sometimes it will take several years. Many expressed how after first hearing about it they felt a need to find out as much information as possible about cryopreservation; From the technicalities and science behind the preservation procedure to the arrangements that need to be made and the different options the different cryopreservation companies provide. Deciding to get cryopreserved is not a decision taken lightly. The cryonicists I interviewed typically said that it is a life-and-death-changing decision. For Tomorrow informed consent is an important concept in the process of signing up new customers. People must understand what cryopreservation is and what Tomorrow can and cannot promise, Kendziorra explained. Several cryonicists also said they were in their teens or early twenties when they first heard about cryopreservation and were not in a financial position to pay for the cryopreservation. For many it was only after having a stable income for a few years they felt they had the necessary funds to sign up for cryopreservation.

The cryopreservation providers

Before Tomorrow, the two American organisations Alcor and Cryonics Institute, and Russian organisation KrioRus, were the only operating cryopreservation providers. All the cryonicist I

spoke with who signed up before Tomorrow existed had chosen to sign up with the American providers, saying they were more sceptical of KrioRus because it was Russian and they had in general more trust in the stability of American cryonics providers. This distrust in KrioRus increased after a scandal unfolding under full media coverage in late 2019 when the two co-founders, and exes, Valerija Udalova and Danila Medvedev, fought over the control of the company and its patients, according to newspaper Daily Beast. It started when Medvedev, CEO, tried to fire Udalova and remove her from the company. Udalova answered by stealing the vitrified brains of 50 neuro patients and transporting them to a secret location. On 7 Sept. 2021 Udalova struck again taking 25 whole-body patients from KrioRus' facility. Medvedev managed to stop the attempted heist with help from the police, but no charges could be pressed against Udalova as ownership of bodies is not legal by Russian law. They then switched to fighting over ownership of the equipment at KrioRus. Medvedev also claimed Udalova sent Chechen bandits to scare him off, which Udalova denies. In November 2021 Udalova managed to get hold of the 25 whole-body patients she tried to get in September and put them in a cryopreservation facility outside of Moscow. Medvedev claims Udalova's transportation of patients has damaged the dewars they were kept in and possibly also the patients. Udalova denies this. Civil court cases between the two have been going on for the last year but are yet to be resolved.¹⁴ One cryonicists I talked to who considered signing up with KrioRus but chose Cryonics Institute instead, said they were very glad they did not choose KrioRus, referencing the scandal and the war in Ukraine which had started a month prior to our conversation.

The American providers have both been operating since the 1970s, Alcor since 1972 and CI since 1976. Today they have about the same number of patients. CI gives demographic data on their website which shows they have 84 members from Germany and 128 members from the UK.¹⁵ Alcor does not have such numbers publicly available, but of the European cryonicist who I spoke with who are members of one of the American providers about half were Alcor members. Cryonics UK works with both Alcor and CI as they have members who are signed up with both providers. When talking about the two organisations at one of the Cryonics UK training days, volunteers said the difference between them is that Alcor helps them if they call up with any issues on a case, "even puts a surgeon on the line". Whereas, the volunteers said, CI does nothing and says Cryonics UK must figure out the issues themselves

¹⁴Read at: <https://www.thedailybeast.com/russian-cryonics-couple-danila-medvedev-and-valerija-udalovas-bad-breakup-led-to-heist-of-frozen-brains?ref=scroll> [13.12.2022]

¹⁵ Numbers gathered from <https://cryonics.org/member-statistics/> [03.05.2023]

if they occur. Most of the volunteers of Cryonics UK I spoke with were Alcor members, but there were a few CI members as well.

Cryonics UK was set up by the first four British Alcor members in 1986, including Max More who would go on to become CEO of Alcor some decades later. One of the four is still an active volunteer at Cryonics UK and talked to me about the beginnings of the organisation. In the mid 1980s two of the four went over to Alcor with the intention to check out the facilities and decide whether or not to sign-up. They both came back with signed contracts. Back in the UK, they realised there was a need for equipment and training for standby and preservation as Alcor was at least one day's travel away and time is crucial in cryopreservation. The two of them got together with their other two friends who also decided to sign contracts with Alcor and gathered some basic equipment. In the beginning it was just the four of them without any real experience and skill, but slowly more people started to join. In 1992 the current leader of Cryonics UK, Tim Gibson joined the organisation. The original member said he was glad they had no cases before Gibson joined, as there was a step up in professionalisation in training and equipment after Gibson joined. "It went from mostly talking about it to actually, hands-on, doing it." During my visits to Cryonics UK, there were discussions among the volunteers about of what the original member called the next step up in professionalisation; having professionally trained medical staff working on the cases. This was seen as a necessary measure due to the decline in new volunteers, the difficulty of having enough people on cases they had experienced in the last few years, and the ageing of the currently active volunteers. The Cryonics UK members had also noticed a new "wave"; a new interest and new organisations with increased professionalism, referring to the new standby initiative from Alcor and Tomorrow in Germany.

At the dinner after the second training day with Cryonics UK I attended, a cryonicist came over to me after hearing I had been at Tomorrow's office in Berlin. He had recently signed up with Tomorrow and wanted to hear my thoughts on them. He was not a member or volunteer of Cryonics UK as they do not currently have a collaboration with Tomorrow. During my conversations with Cryonics UK volunteers, I noticed a certain scepticism toward Tomorrow. Gibson was especially sceptical and said it was because they are new and inexperienced, and "haven't even done a case yet". He asked me a bit about it and when I told him about Tomorrow's planned method of perfusion through the heart, he frowned saying it is not a good method. He said it would not perfuse the brain well enough, and it is overcomplicating the perfusion. Cryonics UK uses a different perfusion method: going

through the jugular veins in the neck with a focus on perfusing the brain with some of the cryoprotectants running down the upper body. Other volunteers were more positive towards Tomorrow, saying it is a positive thing that they have built a storage facility in Europe and their marketing is creating more awareness about cryopreservation, but still commenting on the lack of case experience. When talking to employees at Tomorrow about Cryonics UK and their scepticism toward Tomorrow, they called it an “unfortunate situation” which would hopefully be resolved with time. From Tomorrow’s side they would like to develop a collaboration. This would however be a collaboration on Tomorrow’s terms where perfusion would preferably be done by Tomorrow’s medical professionals and not by Cryonics UK (who are volunteers and not medical professionals as it was pointed out by the Tomorrow employees). Speaking to one of Tomorrow’s managers about the structure of Cryonics UK they expressed surprise at it being solely volunteer-based without any medical professionals. As mentioned in the previous chapter; being seen as a professional and medical adjacent company is important for Tomorrow in distancing itself from speculative and religious practices. Tomorrow also comes from a business-minded investment climate with tech-optimism, which we will look closer at later in the chapter, and is not a grassroots organisation like Cryonics UK.

Currently, Tomorrow only offers memberships to people living in the EU region, i.e., in Europe. This, they say, is in order for them to be able to guarantee good enough standby. If there continues to be a steady growth of customers as in the first two years of operation Tomorrow is planning to expand its operation to the US, specifically the San Francisco Bay area. Several of the American attendees at the EBF conference asked CEO Kendziorra when Tomorrow would be setting up in the US, one saying a good new cryopreservation provider in the US was needed and direct competition would accelerate the growth and advancement of cryopreservation. I spoke with Kendziorra about the future of Tomorrow in an interview and he said that if Tomorrow’s growth does not continue and stagnates, they will not expand operations, even decrease operations if needed. He followed up by saying that the company is his life’s work which he will run indefinitely. With the opening of Tomorrow and EBF, Europe got its first cryopreservation provider, and with them the cryopreservation landscape in not only Europe, but also the US, seems to be going through a change reaching a younger (and wider) audience.

Knowing the risks and accepting the open future

Tomorrow has conversations (via telephone or video call) with all new customers during the sign-up process. During these conversations, I was told, it is important for the Tomorrow employee to get a sense of the customer's level of knowledge and understanding of cryopreservation and the services Tomorrow offer. Talking to one of Tomorrow's senior employees about these customer conversations, I was told that they could sense very quickly from the questions asked by a potential new customer if they would complete the sign up process or not.

“I already noticed a big difference from people that already kind of knew about this topic and they were asking more specific, technical questions. People that heard about it for the first time were just asking for an introduction, I think those people rarely signed up. Even if they liked the answers you gave and thought it sounded interesting. I also asked them when they first heard about it and it seems like for all of them it's years ago. There seems to be a certain amount of time where this has to marinate before people are like “okay”. [...] with people that are pretty high knowledge and high intent, the difference I notice is some people are quite concerned with what the future will look like. They will have questions like, “will I have any money”, “what happens if I don't have a job”, “what will the legal status be like”. I can explain, generally with the trajectory of the humans, we have become more concerned with others. I think if today someone were revived, they wouldn't be thrown out onto the streets, I think people would be very interested in taking care of them. You wouldn't be in it alone, the non-profit organization [Tomorrow Patient Foundation] would be run by people who themselves have a lot of knowledge on this topic [...]. These things aren't guarantees, we can't guarantee that, but we think it's ruffly how it's gonna go, based on current knowledge. We can't really say anything very specific because it is very dishonest. Some people I think are very uncomfortable with that and I think those people are very unlikely to ever sign up.” (Except from interview with a Tomorrow employee in May 2022).

The Tomorrow employee's descriptions fit with interviews I had with Tomorrow customers. At the time of sign up, they had known about cryopreservation for several years, usually at an average of 10-15 years, and had spent a lot of time learning about cryopreservation and knowing the process in detail. They also had unspecific perceptions of the future they would

be revived in, apart from it being a more technologically advanced world which likely would be a better world. More on cryonicists' perceptions of the future will be discussed in the next chapter.

Informed consent is a term of increasing importance in scholarly circles and also a term Tomorrow CEO Kendziorra finds important in the context of the sign-up process for cryopreservation.

“If the person who signs up doesn't understand that this is a very low probability, well not even low, that its unclear probability right, [...] if people don't understand that, it is our job to give them this understanding. If the organization doesn't make sure, then you move further and further to a setting that I think is morally wrong. But if you tell the people “hey we don't know the percentage, it might be very low”. To be fair, I also can't say it will be 1 percent, I can't say it will be 0.1 percent because it might technically be 10 percent or 50 percent. If you present it like that and they still say “hey, yeah, I know, I know, this is fine” then I think you move from morally wrong to morally right. It is their decision if they wanna do it or not. So I think this is why it is important to me that everyone that signs up knows that this is the case. This is why we like to have so many calls with people, because of course you can put it on the webpage, but then they are standard disclaims nobody reads. When we have a call with people.... You gain an understanding if they really understand what this is. Some people are like “yeah, I know, I have been thinking about this topic for five years, I have read everything, I am very well aware”, then you don't need to do much, but others have less information and you need to spend some time until they like “okay, even if it's like 0.01 or 1 percent I would still do it”, then you're fine. This is an important concept for me. In medicine normally you would not be [morally right]. You can't prove yet that it works. The only thing, I think, that moves this field into “it is fine to do it” - because you can't come back from the alternative.” (Except from interview with Kendziorra in May 2022)

Kendziorra compares this to ethical frameworks in medicine, which reflect his medical background and view of cryopreservation as a medical procedure. For him, having informed consent from customers is a justification for selling the cryopreservation procedure without the guarantee of success. In my interviews with Tomorrow customers, I got the impression the information about the uncertainties, and lack of successful re-animation procedures to this date, had gotten through to the customers, and that they had given their informed consent

when signing up. The customers I interviewed talked about “the chance” of getting revived and speculated about the possibilities of ever being revived. It was clear to me that those who signed up were doing this not because they absolutely believed in a successful “re-animation” but because they just thought there might be a slight chance, it just *might* be possible. Several of the customers I interviewed said they wanted to be cryopreserved because it is the only option available today for, possibly, living as long as they want. They argued that the advancements in science and technology might make it possible, sometime into the future, and if it does not work, they would just be dead anyway. For them and Kendziorra cryopreservation is not problematic because the alternative is death and if cryopreservation fails it is just the same as the alternative death.

Having the financial means

The biggest hindrance for signing up for cryopreservation (for those who want it) seems to be the relatively high cost and how to finance it. Most of the cryonicists I spoke with waited several years between deciding to get cryopreserved and signing up for cryopreservation because they felt they had to wait until they were in a financial position to pay for the cryopreservation. For most this implied waiting until finishing an education and having a stable income for a few years. I also talked to some “cryocrastinators”; a term used by cryonicist on online cryonics forums, about people who want to sign up for cryopreservation but have not done so yet for various reasons. The “cryocrastinators” I spoke with all said money and being financially able to afford insurance was the main reason why they had not signed up yet.

The most common way for cryonicist to fund their cryopreservation is through life insurance. Cryonicists take up life insurance policies at the amount a cryopreservation will cost with insurance companies pre-approved by the providers where the provider is the beneficiary of the insurance policy. When a customer of a provider dies the insurance policy amount is paid out to the provider, and the cryopreservation is thus financed. The provider also allows one-time payments for the cryopreservation, but very few cryonicists have the financial means to do it. The main objective for the providers is that they will not start the cryopreservation before they have the money in one of their accounts. Let us now look at the pricing and financing options at Tomorrow and Cryonics UK.

The current price of whole-body cryopreservation at Tomorrow is 200 000 euros. As mentioned in the previous chapter Tomorrow recently began offering brain-only cryopreservation to the price of 60 000 euros, and they say bringing the cost of cryopreservation to make cryopreservation more available to more people is important for them. The price covers the cryopreservation procedure done by Tomorrow, storage at EBF and revival when future technology allows it. Tomorrow also has a 25 euros per month membership fee which comes on top. Tomorrow suggests three different options for customers to fund their cryopreservation: Term life insurance, whole life insurance, or alternative funding. Term life insurance is what Tomorrow recommends to most of their customers. With term life insurance a customer is immediately covered for the 200 000/60 000 euros needed to get cryopreserved, so it guarantees cryopreservation as long as it is in effect. It is in effect between the ages of 18 and 65, if/when a customer is over 65, they are not covered and need to get the 200 000 /60 000 through other means. Term life insurance is paid for in monthly fees based on the insurance company's risk analysis from case to case. Age and health, e.g., medical history, smoker/non-smoker, and mental health issues, are used to calculate the monthly fee. Whole life insurance, which is another option (instead of term-life insurance) is set up as a life savings plan with the insurance company. A customer pays instalments as one wishes, but the insurance is only covering the amount which has been paid at any time. To cover the cryopreservation, 200 000/60 000 euros will have to have been paid into the whole life insurance. Tomorrow recommends whole life insurance for customers who are able to pay 200 000/60 000 euros straight away, and to customers who are around 65 when they sign up or have medical issues which make them ineligible for the term life insurance. According to Kendziorra, it makes sense to use the term life insurance for younger cryonicists, who, in the event of dying at a young age, will have their cryopreservation covered. This will be as a safety until they grow old and more likely have saved up the financial means to pay for the cryopreservation upon death. By the time younger people that sign up today are over 65 Kendziorra said he also hopes cryopreservation has become widespread enough for many more people to sign up, which will bring down the individual cost of each cryopreservation. The alternative funding is a collection term for customers who don't want to use insurance from Tomorrow's insurance partners or have other

means. Customers using alternative funding will have to pay the 200 000/60 000 euros directly to Tomorrow before the cryopreservation procedure.¹⁶

If customers choose to get insurance through Tomorrow's insurance partner, a German insurance company¹⁷, Tomorrow assists customers through the insurance process. Usually, the process of getting insurance goes smoothly, but sometimes there are some discussions around the price-setting when customers get a higher monthly fee than expected. On a few occasions Tomorrow employees expressed concern about telling customers about the quote for the monthly insurance fee they had gotten from the insurance company and having to tell the customer about a higher figure than expected. I also spoke with a "cryocrastinator", who previously tried to sign up with Alcor but could not get insurance with Alcor's insurance partner because they had a chronic illness. The "cryocrastinator" hoped Tomorrow's collaboration with a "nice" German insurer would give them a life insurance policy.

There are discussions among cryonicists about which insurance is best. A young man attending a Cryonics UK training day for the first time had many questions regarding life insurance for the other attendees. He was in the process of signing up with one of the American cryopreservation organisations and had spoken to a financial advisor recommended by Cryonics UK about the different options. The attendees had different insurance plans and spoke about how term life insurance used to be recommended and was what most people had, but that now there had been a shift towards whole life insurance and that's what they recommended the young man to get. Other cryonicists I have spoken with however have called whole life insurance a terrible investment, as it will require much more money put in because of inflation, and cost much more in the end if it is used for a long time. Where term life covers from the beginning, most people will live past the term the insurance is for and would therefore need to save up to pay for cryopreservation and potentially spend double. Whereas with whole life insurance what you pay for the insurance will go to the cryopreservation and there is no need to save extra money, but you're not fully covered until the amount the cryopreservation cost has been paid in. So, depending on the expected need, and expected deanimation time (legal death), one or the other is chosen. Kendziorra said what he saw as the best option was having term life insurance for as long as possible, saving up, and having the whole life insurance when the term life runs out. This way, he explained, the

¹⁶ Numbers and explanations gathered from Tomorrow Biostasis website, <https://www.tomorrow.bio/pricing> [08.11.2022], and from conversations with employees at Tomorrow Biostasis during fieldwork.

¹⁷ Tomorrow's insurance partner: <https://www.vkb.de/content/aussendienst/a/aus/> [23.05.2023]

person is always covered and will not lose much on the whole life insurance as it is just for a short amount of time. All these discussions about insurance policies, inflation, and investments for a life insurance might seem odd for a group of people who also talk about not dying. It is, however, something about these discussions which move cryopreservation into the more “normal” and every day. They are discussing life insurance in the same way one might discuss travel insurance; as something everybody should have to be cautious and mitigate potential future risks, whether it is a cancelled flight or death.

As Cryonics UK only does the cryopreservation procedure and not the storage and revival, their cost is much lower, at approximately 20 000 pounds (exact cost varying from case to case) with a 10-20 pounds monthly membership fee (depending on age and training session attendance).¹⁸ To be cryopreserved by Cryonics UK one needs to have a contract for storage at one of the two US organisations, Alcor and CI. Previously Cryonics UK also did cases for KrioRus customers but stopped after the 2019 scandal at KrioRus. Money for the cryopreservation procedure needs to be paid upfront to Cryonics UK before they start the preservation. Cryonics UK gets a few calls each year from people who are not members with them or have contracts for storage with other organisations. In most of these cases, the patient has already died, and money needs to be paid out quickly, which according to Cryonics UK volunteers rarely happens, so the cases do not go through. For cryonicists, having papers in order and having funding in order is important to have the fastest and best cryopreservation possible, or even having a cryopreservation at all.

Insurance in different contexts

After trying to understand the different options myself, I can very much understand why insurance is the part of the sign-up process which brings up the most questions and confusion, especially among Europeans who are not as well-versed in health and life insurance as Americans. All of the European cryonicist I interviewed lived in countries with public health care systems covering all necessary medical treatment for all citizens, meaning private health insurance is not needed. This is different from the US where the health care system is a mix of private and public and over half of US citizens rely on private health insurance.¹⁹ An

¹⁸ Numbers gathered from <http://www.cryonics-uk.org/faq.html> [08.11.2022]

¹⁹ Numbers gathered from <https://www.ispor.org/heor-resources/more-heor-resources/us-healthcare-system-overview/us-healthcare-system-overview-background-page-1> [02.02.2023]

American cryonicist will likely have more experience with insurance policies and insurance lingo before signing up for cryopreservation than a European cryonicist.

The insurance and investment logic of the American cryonicists “buying the future” or “buying time” that Romain (2010a) describes is not as clearly present among my European interlocutors. In the US insurance is a crucial part of protecting one’s own assets and livelihood. From health and life insurance to car and house insurance. It is up to each individual citizen to create a financial safety net through insurance policies, a safety net the government provides in welfare states. In countries with universal welfare schemes, which most of my interlocutors live in, the government covers, to a large degree, the financial risks and losses private insurance would cover. Life insurance policies are common among US citizens and are important to mitigate the financial security of a family and pay for death care and a good funeral upon the death of a relative as Kneese (2022) and Mulder (2020) have shown. For most Americans, health and life insurance is a life-and-death necessity. The welfare state has public health systems and social benefit systems to mitigate where an American would need life and health insurance. Though insurance on material goods and luxuries, like cars, houses, and travel is common to have for Europeans, this is different from insurance on life and health, to have to personally insure one’s own opportunity to live. One’s own life and future opportunities are taken into own hands in a very different way when “everything” needs to be insured. Using life insurance to finance their cryopreservation, just like life insurance is used to arrange for other death care among Americans, is not something new for the American cryonicists. Tomorrow and European cryonicists do use insurance to finance their cryopreservation but their choice and reasoning behind their cryopreservation do not seem to include the same insurance and investment ideas from neo-liberal and free market thinking which Romain describes. The focus is more on the practical sides of how to actually finance it, and, as I pointed out above; about making it part of a more “normal”, an (almost) every day, activity. Buying an insurance for cryonics is something practical, similar (almost) to buying a travel insurance. The insurance logic is not so much an investment logic for Tomorrow’s customers as it is a logic that brings cryonics from the abstract to the practical.

This does not mean, however, that there are not economic drivers that should be looked at for gaining an understanding the growth of cryopreservation in Europe. I will now turn to what I describe as the “economic climate” which promotes the tech-optimism and innovations, especially in biotech industries.

Industry 4.0 – The fourth industrial revolution

The start-up company Tomorrow, and the very idea of cryopreservation is part of a specific technoscientific context. A context where specific value and meaning are attached to the (imagined, hoped, and planned for) breakthrough in scientific development. However, Tomorrow is also part of a specific economic and societal context; one wherein science and technology, innovations, start-ups, and new industry (specifically for high-tech medical services) is not only hoped and planned for but also directly encouraged through new economic and financial policies in the EU. These new policies have to a large degree been centred on promoting and stimulating growth in the era of what has become known as the 4th industrial revolution.

In 2016 Klaus Schwab, a German economist and founder of the World Economic Forum, published a book called *The Fourth Industrial Revolution*, prior to the annual World Economic Forum meeting. Here Schwab writes that the world is at the beginning of a new industrial revolution where technology with disruptive potential, such as the internet of things, big data, and AI will transform humankind. Some might argue these trends are a continuation of the third industrial revolution, brought in by computer technology, say Schwab. The first and second industrial revolutions came with the steam engine and electricity accordingly. Yet there are three reasons why there is a fourth distinct revolution according to Schwab. The first is velocity, the technology is evolving exponentially. Secondly, breadth and depth, building on the digital revolution, is not only changing what and how we do but also who we are, and lastly; systems impact. Entire systems are transformed across countries, companies, industries, and society as a whole with the new technology.

Though Schwab looks at both the upsides and downsides of this new technology, there is a general display of tech-optimism and trajectory of future development which is in line with transhumanism. Schwab calls for a “[...] comprehensive and globally shared view of how technology is changing our lives and those of future generations, and how it is reshaping the economic, social, cultural, and human context in which we live in.” (2016, 2) The book is Schwab’s suggestions for “stakeholders of global society”, government, business, academia, and civil society, of how the fourth industrial revolution will impact the world, and what can be done to “harness it for the common good.” (ibid) Schwab has been critiqued for showing the good and evil of these new technologies without sharing his own position, and just giving

vague policy recommendations.²⁰ Technology is not something out of our control according to Schwab. It is not a binary choice of accepting and living with it or rejecting and living without it. It will be present either way. Thus, for Schwab, this revolution needs to be followed closely. If the new technology revolution is examined sufficiently there is an opportunity to shape it, and thus improve the state of the world, according to Schwab. Schwab points to some bio-technologies that will drive much of the new revolution, especially, cell-editing, synthetic biology in the context of 3D-printing cells, tissue, and organs, and learning human brain functions through new neurotechnology. From nanotechnology to quantum computing, new emerging technology will fuse and interact across the digital, physical, and biological domains, argues Schwab.

Schwab was not the first to address and define how new technologies have and will have a revolutionary impact on human life and society. The term “Industrie 4.0” (Industry 4.0) was coined at the Hannover Fair in Germany in 2011 when talking about how smart factories would revolutionize the organisation of the global value chain. In 2020 the German federal government implemented the platform of “Industrie 4.0” in their plan of action for high tech strategy to address the social and technological developments in the technology industries.²¹

Political science scholar Klaus-Gerd Giesen (2020) has examined transhumanism’s impact on the international political economy and how transhumanist ideology justifies the development of the new technology of the 4th industrial revolution. Giesen predicts the NBIC (Nanotechnologies, Biotechnologies, Informatics, and Cognitive sciences) technologies will give a new enormous market in the world economy expanding the commodification of human life. Transhumanism, according to Giesen, serves as the ideology which promotes the need for all these new technologies and justifies the expansion into the world economic market. It is a political project which benefits those industries and economics most involved in the 4th industrial revolution and probably will lead to complete redistribution of wealth, reconfiguration of social class, and make profound changes in how societies and the world systems functions, argues Giesen (2020, 152). Through state agencies, international institutions, such as the European Council, private investors, such as Elon Musk, Peter

²⁰ Read at <https://www.theguardian.com/books/2017/jan/06/the-fourth-industrial-revolution-by-klaus-schwab-review> [09.02.2023]

²¹ Read at <https://www.plattform-i40.de/IP/Navigation/EN/ThePlatform/Background/background.html> [29.04.2023]

Diamandis, Peter Theil, and, GAFAM (Google, Apple, Facebook, Amazon, and Microsoft), as well as entrepreneurs of the many tech start-up companies, ideas of transhumanism spread on the world market. The promoters of transhumanist ideas have the advantage of money. For Giesen, this is not a welcomed scenario. He calls transhumanism an anti-humanist program, following philosopher Gunter Anders, which will lead to “the obsolescence of humankind”.

In other words, Giesen sees in the industrial development of new technologies, especially in the discourses around the hype of the new disruptive technologies, an alignment between transhumanism and industrial policies, driven primarily by big capital but also by governmental policies that buys into the idea of not missing out on the 4th industrial revolution. New policies of industrial development are talking the same language as transhumanism, without calling itself transhumanism. Giesen sees the transhumanist political project as on track. It has reached out into the worlds of politics and economics and the transition to the 4th industrial revolution seems to be happening without political controversy. According to Giesen transhumanism, and especially its aligned political projects, is the greatest challenge for world politics in the 21st century.

I have pointed out how the new generation of cryonics in Europe, or cryopreservation as they prefer to call it, on the one hand grows out of the transhumanist movement, being in many ways an heir to Alcor and CI, but on the other hand “brings it down a nudge”. They talk the language of science more than the language of science fiction. In many ways they are becoming more mainstream not only because they choose to talk the language of science, switching from cryonics to cryopreservation, or biostasis, for instance, but also because they talk the language of the new industrial economy. They are talking the language of the 4th industrial revolution. Their technologies, their visions of the future, is driven by what Schwab calls the emergence of NBIC technologies. Tomorrow is a biotech start-up company set up by co-founders with backgrounds in successful tech start-up companies. The service of human cryopreservation depends on the new technology promised by the 4th industrial revolution.

However, although Giesen points to the alignment between transhumanism and the 4th industrial revolution he does not quite catch the full picture. Most of the European cryonicists I met did not call themselves transhumanists and are not concerned with the political project of transhumanist ideology that Giesen describes, but rather with biomedical progression. Tomorrow is by their founders described as a biotech start-up doing a medical procedure to preserve humans for the future. It is not, as Giesen has described, as if transhumanist ideas and ideologies fuel this branch of the biotech industry. Quite the opposite; Tomorrow

explicitly keeps their distance from transhumanist discourse of immortality. They are fuelled by the techno-optimist climate of the 4th industrial revolution, and the much more widespread belief in medical and scientific progress to health and wellbeing. Tomorrow is significant, I think, of a new development in transhumanism. It does not need the name and ideas of transhumanism. The environment of politics and incitements driving business and growth towards the era of the 4th industrial revolution is taking its place. As demands for services to optimize health and length of lifespan are offered by biomedical companies an increasing amount of biomedical and biotech start-up companies are founded. It is in the context of this tech-focused economic environment Tomorrow was founded in 2019. Thus, Giesen has pointed to an important alignment, but the current economic climate makes this alignment multidirectional. It is not as if transhumanism is driving this field. It seems to me that the push of the new biotech industry comes from a much wider and more mainstream belief in technoscientific progress than in an explicit transhumanist ideology. However, the former is strengthening the latter. In other words: although Tomorrow has grown out of a specific investment logic and technoscientific culture, and not as an ideological transhumanist initiative, it brings new energy and enthusiasm to the transhumanist field. When I met young cryonicists at the EBF conference and read posts on the “Cryosphere” discord server, Tomorrow and Emil Kendziorra was praised for their professionalisation and medicalisation of cryopreservation, for bringing the field more up to date and making it more appealing for younger people. There seems to be a shift from transhumanist ideology to a broader mainstream tech optimism among young cryonicists. Transhumanist or not, tech-optimism and advancement of the human, and new economic climate of the ideology of the 4th industrial revolution, are the basis for cryopreservation, for Tomorrow and their cryonicist customers.

Having discussed the economic context of the growth of cryopreservation, let me now move on to the legal and regulatory frameworks:

Working the legal systems

Human cryopreservation is not legally regulated anywhere in the world. There are different ways in which cryonicists work with current legal regulations to do cryopreservation. There have also been court cases where family members of a cryonicist have tried to stop the cryopreservation of their parent or child. Getting cryopreservation into the legal system and

having legal regulations for revived individuals is a great concern, and also much discussed among cryonicists, for instance on their online forums. It was brought up in my interviews with Tomorrow customers and among the Cryonics UK volunteers at trainings, and discussed on several occasions at the EBF conference. There are currently a lot of unknowns in the legal aspects of cryopreservation. Let me unpack this:

How does a clinically and legally dead body “travel” from the place of death (often in a hospital or elderly people’s home) to the cryopreservation facility? Here, the last will and testaments are crucial. For the cryopreservation to proceed they have to donate their body to science and specify the cryopreservation provider as the receiver of their donated body. Tomorrow has a template testament they give out to all customers which they recommend using as it has all the correct information and legal language for the preservation process to proceed without (damaging) delay. It is also recommended to inform a next of kin who is not against the cryopreservation and who can help make sure the arrangements go through once the cryonicist “deanimates”.

In 2016 a 14-year-old English girl with terminal cancer went to court to get cryopreserved (see also Eriksen 2023). As she was underage, she could not have a last will set up by herself and it was up to her parents to decide for her. Her mother wanted to respect her daughter’s wish to get cryopreserved, but her estranged father was against it. The girl told the court in a letter that she knew she was terminally ill and would soon die and that cryopreservation was her only chance to live longer. The court ended up ruling in favour of the girl and her mother and she was cryopreserved at Cryonics Institute after her death in October 2016. Cryonics UK did the standby and perfusion of the girl. In the press, they were described as a volunteer group with no medical training.²² Talking to a couple of Cryonics UK volunteers about it they recall a lot of media attention at the time of the court case. One described a day of running from studio to studio appearing on tv and radio to talk about cryopreservation and Cryonics UK’s work. They also said that after the court case, there was a noticeable difference in how journalists approached them and the questions they asked, with less focus on cryopreservation as suspect and fraudulent to a more neutral and nuanced portrayal of it.

²²Read at <https://www.theguardian.com/science/2016/nov/18/teenage-girls-wish-for-preservation-after-death-agreed-to-by-court> [24.01.23]

It is also quite important to die an uncomplicated death. If a death is seen as suspicious or with an unknown cause an autopsy to determine the cause of death will be required in most countries. An autopsy would destroy the chance of a good cryopreservation. There is however in most countries a law to prevent an autopsy, referred to as belief-system laws by most cryonicists. These are laws which state that a person can refuse medical treatment and autopsy due to their religious convictions, such as Jehovah's Witnesses not accepting blood transfusions. According to Cryonics UK volunteers, one could argue that cryonics is a belief-system in the context of the legal system, and thus avoid autopsy, though it has not been tested by them. They are also quick to clarify that calling cryonics a belief-system is a "way out", and not ideal for them. They are, as I have pointed out, very secular, very anti-religious. Cryonics, for them, has nothing to do with belief or religion, but nevertheless, it could be useful in certain situations to be viewed as such by the legal system.

If your death involved crime, however, the body will be taken by law enforcement and not released for days which results in being "too dead for cryopreservation" according to Cryonics UK leader Tim Gibson. As one of the volunteers of Cryonics UK followed up Gibson's comment; "So don't get involved in anything, die naturally".

As you have to legally die to get cryopreserved today, upon revival you will not be the same legal person you once were. All the property and assets that were yours previously, tied to your legal person, will no longer exist as yours. Some cryonicists used dynasty trusts, i.e. setting up a trust for themselves, where they are both giver and receiver of assets (see also Eriksen 2023), upon legal death, but there is no guarantee the trust will still exist and/or have any value left in them. Planning for the best possible life after revival is very important for some cryonicists. Others spend little time and thought on it, just being alive again in the future is important. "If I don't like it, I can just choose to die then." This was said by several cryonicists I spoke with when I asked them about the possible outcome of the future after revival.

Ready for the future

Setting up a cryopreservation business to be stable for the future and setting up a cryopreservation of yourself upon legal death takes some preparation and arranging. Tomorrow, "A Biotech company specialized in human cryopreservation" as the headline on their website states, began its operation as the first European-based cryopreservation provider

powered by the cultural “energy” created by Schwab’s 4th industrial revolution. As I have shown, it is also a company with adjoining foundations set up for the long-term. The European cryonicists I spoke with, now with a provider option much closer than before, did not take the decision of their cryopreservation lightly. They have spent years gathering information, and least not; funds. Funding cryopreservation through life insurance might not be as perfect a fit as it is for the American cryonicists described by Romain. However, the insurance policies give, as I have argued a practical gateway to the realm of living for an indefinite amount of time.

So now with papers signed and funds provided for, the cryopreservation is all set up and ready for the future. But why do the cryonicists want more time and how do they imagine spending the time? This is what we will take a look at in the next chapter.

Chapter 4: The temporality of not dying – Future making for the long-term

This chapter deals with cryonicists imaginations of the future and how temporality is thought about and lived by cryonicists. It looks at the making of a technoscientific future where ideas about indefinite lifespan opens new horizons and specific futures. In a fast moving and rapidly changing world, life is seen, by my interlocutors, to be too short. They seek out a future where lifespan is chosen. In this chapter, I first look at the concept of immortality and how my interlocutors do and do not use it. Then I move on to the specific promises the future entails for cryonicists. I look at Harvey's (1989) theory of time-space compression and how cryopreservation and cryonicists are both enthralled by time-space compression and challenging it, and how the sped up time of the present is harnessed by cryonicists to secure a long-term future. Then move on to look at how time is presently imagined in the near and long term through Jane Guyer's (2007) comparison of temporality in monetarism and evangelical Christianity. Building on Farman (2020), I then look at the changes in biological temporality cryopreservation brings with the freezing of time. Finally, I ask (and try to answer): what is life without an end date.

The I-word

Immortality is a word which, as I already have pointed out, was seldom used by my interlocutors. Tomorrow does not use "immortality" in any of their marketing. On their website it is rather "Live without a time constraint".

Live without a time constraint

Of all the possible careers, hobbies, cultures, and lifestyles that exist, there are very few that can be explored in an 80 year life span. What free time activities and interesting topics have you given up exploring because you didn't feel there was enough time?

Figure 6: Screenshot from www.tomorrow.bio/intro-to-cryopreservation [28.02.2023]

Shying away from using the concept of immortality is, as I see it, another way in which the company Tomorrow is working to distance itself from anything that can associate them with speculation, religion, and fiction. As mentioned in chapter 2, separating cryopreservation from religion and pseudo-science is important for cryonicists. Immortality gives religious connotations in the promise of an eternal afterlife in a “heavenly” place, which is not something the secular cryonicists want to be associated with. It is important for Tomorrow to be recognized as scientific and medical. It may also be part of a strategy where they do not promise something they cannot know that they can give (immortality). This follows from Kendizorrias’s idea of informed consent among customers. However, the phrasing of “without a time constraint”, is clearly also shorthand for indefinite life, and immortal life. The nuance here is interesting. Tomorrow is balancing on a very tightly rigged string, trying to manoeuvre the idea of living forever with the acceptable medical and scientific discourse they also need for gaining public legitimacy.

At one instance, however, I was encouraged by a Tomorrow employee to include the name of the larger project I am part of, “Technoscientific Immortality”, explicitly in my presentation for customers. It was at the beginning of my fieldwork at Tomorrow’s offices and I was sending out an interview request for Tomorrow members. The sensational name (*Technoscientific Immortality*) would, according to the employee, probably intrigue and apply to some of the members. During the interviews most said they wanted to live long but not forever. Some said indefinitely. Those who talked about immortality said it was not something they wanted or thought could be achieved. It was being able to have the freedom to choose the length of one’s own life which made them sign up for cryopreservation, not the promise of immortality.

Another episode from my fieldwork is indicative of this distinction between “indefinite lifespan” and “immortality”: At the EBF conference I was introducing my research to a group of researchers and leading figures in the cryopreservation field and mentioned the name of the research project (*Technoscientific Immortality*). One of them immediately shrugged and said “Ah, you know, we don’t really like that word.” He explained how immortality came with some ideas, without explicitly saying what ideas, and why cryonicists would like to distance themselves from them. He said the “I-word” was maybe used in the very early days of cryonics, but today it is more about having a “chosen lifespan” than living forever. There were nods of agreement from the rest of the group.

“Indefinite life”, “life without a time constraint”, “a chosen life span”, are all ways of speaking about a life where the problem of death is gone. Cryonicists’ imaginations of not

just the future, but their place in the future, are premised on the potential of not dying. This potential of not dying plays out in their future making. The temporality of the present and the future is also changed by and for cryonicists when life no longer is a timed project in an ever-progressing world.

“Immortalist” is the term used by Farman (2020) and probably reflects the early phase of the cryonics movement (pointed to above in the quote from my interlocutor), which Farman picked up on during his field studies in the late 2000s. It seems to me that the change in the discourse (from immortality to chosen lifespan) is a fairly recent one, and perhaps even a result of the new initiatives that Tomorrow represents. At the very least, this change is not described by Farman (2020), Bernstein (2019), or Romain (2010a) (the only ones to have done ethnographic studies of the cryonics movement). Thus, my interlocutors would not describe themselves as “immortalists”. The project of cryopreservation is based on the idea of controlling death, and thus also controlling life; managing a chosen lifespan. Let us look closer at this: what does the idea of overcoming death entail?

Technoscientific future-making – What the future might hold

Immortalism should be analysed as social and historical projects of future-making, not as individuals natural or timeless bids for survival or preservation, argues Farman (2020). Where secular relations to death are about preserving the past, immortalism is future-oriented. Technoscientific immortality is a form of future making which collapses prediction and promise, argues Farman. The prediction of immortality will come because of the unstoppable pace of scientific breakthroughs. The promise says the prediction will come and be a good thing which will cure everything and fulfil the ancient human desire of not dying, argues Farman. But how is this future imagined, what does this future promise, who is it for, and what futures does it displace?

“Immortalist futures are overdetermined by the technological landscape in the United States, by the tools and ideas emerging out of the centre of tech, and by the social structures and informatic premises that undergrid that landscape.” (Farman, 2020, 29).

Technology is also at the core of my interlocutor’s future imaginings. With their present technoscientific optimistic world view they create a certain future containing technology and science as the central drivers of progress and solvers of current problems, most importantly the problem of death. This solutionist approach to life can be seen in cryonicists’ idea of the informatic person and death as discussed in chapter 2, the set-up of a

cryopreservation contract, as discussed in chapter 3, and the prediction (and promise) of a continued life in a better future brought forth by technoscientific developments.

In all my interviews with European cryonicists I asked if they had any imaginations of the future they possibly would be revived in and what they wanted to do with their (potentially unlimited) future life. The answers varied, some very detailed but most were vague. The vagueness was attributed to not being able to predict the future, but most of them pointed out that, due to following trends in tech and medical developments, it would more likely than not be a better place to live than today. The idea was that the world is a much better place today than say 200 years ago; people live longer, have more access to resources etc. Thus, the world will likely be better in yet another 200 years' time. This positive outlook on the future was shared by most interviewees. One of them pointed out that committing to cryopreservation entailed exactly this; an idea of the future as more likely better than worse. Others of the interviewees said the future could go either way, better or worse, but the likelihood of resources being spent on technologies for revival would be much higher if the world was a better one. If the world has developed in a worse direction they could just stop living (i.e. not being revived); "die for real". "Nothing to lose", in other words, is exactly the key rationale of the cryopreservation movement: nothing to lose, everything to gain. As mentioned in the previous chapter, a Tomorrow employee stated that those signing up for cryopreservation are less "detailed-minded" about the future, and accept there are no guarantees for what the future is going to look like. I got the impression that one of the main motivations for getting cryopreserved was the idea of being able to see what happens: to not "lose out" (the phrase many would use), in case the opportunity for revival would be possible. "I am a curious person" and "I am curious to see the future" was said by almost all my interviewees and other cryonicist interlocutors.

Something else did repeat itself, in my interviews. There is a key topic of concern for cryonicists. Post-scarcity is mentioned by many as maybe a possibility in the future they would be revived in. "Technology will have solved many current problems." "Hopefully you would not have to work just to earn money." In a post-scarcity world, they could do all they ever wanted. They could do all those activities that cannot be fitted into their current life, which is taken up by work. They could spend their time on hobbies, travelling, reading etc. As advancements in biomedicine would be needed for revival to happen, and key among them is rejuvenation, the post-revival society would also be one of post-ageing. Life would not be restricted, and you could not only choose the length of your own lifespan, but you could also choose activities which, in old age at least, would be hard. Thus, cryopreservation is as much

about having a shortage of time, as it is about immortality, which again reflects their choice of word: chosen life span, indefinite life, rather than immortal. All my cryonicist interlocutors seemed to express a feeling of not having enough lifetime, too much to do and experience and not enough time. Cryopreservation could give them more time, infinitely more time.

In the online community on the Discord server Cryosphere, where most of the members are from the United States, I observed discussions about space travel especially around the times of news and launches from the commercial space programmes of Virgin Galactic and Space X. From the descriptions Farman (2020) gives, space travel and colonisation of space are key elements of his American interlocutors' imaginations of the future. The transhumanist declaration also states, "We foresee the feasibility of redesigning the human condition, [...] and our confinement to the planet earth."²³ Space exploration has been a key part of the transhumanist project, but as I have discussed previously in chapters 1 and 2, transhumanism is not a self-identifying concept among my interlocutors. Europeans also took part in these discussions on Discord and some of my interviewees did speak about space travel, but most of my interlocutors had more "Earth-bound" ideas of what they wanted to achieve in a future life. They mentioned hobbies, learning everything there is to know, reading all they ever wanted to read etc., and only a few spoke of space travel and colonization. Again, this points to the move I have already emphasised, from transhumanism with capital letters to a more "down to earth" idea of just having more: more breakthroughs, more technology, more life, but primarily more time. One interviewee told me about how they wanted to do so much in life, that they would not be able to achieve with current life expectancy, and how with an indefinite life they could get everything out of life. They wanted to see the whole world, study all the fields of study, try out all different careers, be president, and experience space travel and meet extra-terrestrials. Another interviewee did, unlike most of my interviewees, have many and quite detailed imaginations of their future. They saw themselves living over 300 years into the future engaging in travel across both space and time. This person was a science-fiction fan and referenced both science-fiction works such as *Star Trek* and popular science works such as Michio Kaku's *Parallel Worlds*. About choosing to get cryopreserved they said; "when you are reading a lot of books dealing with science and science fiction and physics you will once pass the topic of eternal life, and well that's the way it have been for me". A bit later in the interview when talking about the future they said;

²³ Transhumanist declaration: <https://www.humanityplus.org/the-transhumanist-declaration> [17.03.23]

“everything is speeding up, Moore’s law²⁴. If you prolong this into the far future, like the future of the Star Trek universe in the 23rd century, I think there will be many, many things that will turn from speculation to science, you know. I think the science fiction of today is the science of tomorrow.” Many of my interlocutors said they liked science fiction, and some referred to it as one of the sources they had on cryopreservation, but not many referred to specific works or science-fiction tropes in their imaginings of the future. My main impression is that science, and what Farman has called the promise of science (2020, 27), and not science-fiction, is what motivates most of those who sign up. Referencing fiction too much, something that is speculative and not “real”, is risking the process of legitimising the cryopreservation field.

I also asked interviewees if they wanted family and friends to join them in getting cryopreserved. Almost everyone said they would like close family members to join, but only a couple had family who currently would like to get cryopreserved. One had a partner who was also signed up for cryopreservation, and one had a partner who was considering signing up. Not many had family members who were very opposed to their cryopreservation. An interviewee from southern Europe did have a family who was against cryopreservation. The interviewee characterised them as very religious and stuck in tradition. He pointed to a difference between the north and south of Europe because of differences in religion. The northern countries with a Lutheran tradition were more secular and thus, he assumed, more open to cryopreservation. The southern countries being catholic and orthodox he had felt were more conservative and condemning cryopreservation. In passing conversation at the EBF conference I heard young cryonicists discussing their parents’ attitudes to cryopreservation, one saying they thought they had convinced their parents to sign up, and a few saying they were discussing it with their parents and that they thought they would be able to convince them to sign up. Interviewees said it would be nice to have loved ones with them in the future, but they see cryopreservation as, as they phrase it; “a personal choice”, and they are not pushing anyone to sign up. Several also pointed to the fact of other people (those at the EBF conference and fellow volunteers in Cryonics UK for instance) are also being cryopreserved so they would not be alone in the future. Other cryonicists would also be revived at the same time as them. For some of those who knew other cryonicists in person, I asked if this reassured them. Some answered not really as they did not see them as close

²⁴ Moore’s law is the 1965 theory created by physics and co-founder of Intel Gordon Moore, of the doubling of transistors in the same area in a microchips per year, exponentially increasing the capacity of computers. DOI: [10.1109/JPROC.1998.658762](https://doi.org/10.1109/JPROC.1998.658762)

relations. Other said it was good to have others they knew with them into the future with the shared experience of being cryopreserved and revived. Cryonicist visions of the future hold different contents, but they all share the idea of taking advantage of present and future science and technology to continue life.

To sum up so far: On the one hand, I observed a very “down to earth” attitude towards the idea of being revived. The sentence “nothing to lose” captures the sentiment well. On the other hand, there seems to be an eager expectation for a future without limit; a future where you can do everything, consume everything, learn everything, be everywhere. This might seem like a paradox; realism (revival might happen, or it might not) combined with (a form of) faith in the “wonders” of science and unlimited possibilities. Cryonicists believe science will achieve what is “promised” based on a rational belief, based on reasoning, on what they think is possible. This will be unpacked later in the chapter. First, I want to take a look at the feeling of “not wanting to lose out” which is prevalent among my interlocutors.

From ephemeral to permanence – time in the globalised world

Marxist geographer David Harvey’s concept of Time-Space Compression has been much used to describe the condition of life in what he calls post-modernity. Through the accelerations of speed in labour and consumption in the capitalist world, and the rapid development from sea travel to rail travel to air travel and from letters to telegraph to telephone to internet, reaching across spaces in hours and seconds instead of months and days, time and space have become “compressed” (Harvey, 1989). The quickening of pace compresses space. This time-space compression has brought deep-reaching effects, according to Harvey pointing to two important shifts in consumption. One is the move from elite fashion to mass fashion, involving not just accelerated consumption of clothing and decoration but also lifestyles and recreational activities. The second shift is from the consumption of goods to the consumption of services – entertainment, spectacles, happenings, distractions – for example, concerts, movies, going to a museum or health club, which has a far shorter “lifetime” than a car or washing machine, argues Harvey. In commodity production instantaneity and disposability are key concepts. This has created a throwaway mentality of not just material products but also relationships and lifestyles. Harvey argues these rapid changes in social life create a “temporariness” in value systems on both the public and personal level, reflecting an increasingly fragmented society. The need to be adaptive and fast-moving in response to market shifts makes long-term planning extremely difficult, argues Harvey. Reactions to the

ephemerality can be seen in the growth of insurance against all kinds of future risk and losses. Deeper questions of meaning and interpretation are also brought forth by this ephemerality. According to Harvey, the increase in religious revivals and growing interest in searches for authenticity can be understood as a reaction. People are looking for “anchorage”. This is reflected in the new interest in social institutions such as the family and community, and the search for historical and ancestral roots, all pointing to a search for more secure anchors and longer-lasting values in a shifting world (Harvey, 1989, 292).

The spatial adjustments of the last century have also been great and rapid, says Harvey. Satellite communication systems (and later; the world wide web) has made the cost and time of communication irreverent with respect to distance. As all the space in the world has become visible and within reach as space has been compressed, the idea of traveling and experiencing the whole world become possible. My interlocutors imagine spending their future time exploring the world, traveling, and “experiencing different lives “, as one of my interlocutors put it. The potential access to so much space cannot be explored in the current lifetime, thus the compression of space adds on to my interlocutors’ feelings of not having enough time to get all out of life.

My interlocutors see progress, the speeding up of time as the key to the future they want. They *need* the fast-pace to bring them significant breakthroughs. This however, contrasts with the increasing concern for what Hylland Eriksen (2016) has called an overheated world. Since the 1990s and into the 21st century, modernity has “shifted into a higher gear” and with population growth and heightening energy consumption, the double bind of economic growth and ecological sustainability collide, due to the overheating of the world, argues Eriksen. In our globalised, neoliberal and informational age local communities are everywhere part of both the global and universal and the particularly local and global changes affect locally in different ways, on different scales. Clashes of scales between the global and the local often happen when the short-term concerns take precedence over the long-term survival, such as jobs taking precedence over environmental sustainability. Tensions such as these are characters of the overheated world, argues Eriksen. Cooling down the overheated world would entail a slowing down of the acceleration of change; the environmentalist activist demand cuts in energy consumption and advocate “slower living”.

This is in many ways the opposite of what my interlocutors advocate. They believe in the need for the world to accelerate, at least in the development of technology and science. Where the environmentalists see the need to cooldown the whole world, my interlocutors only

see the need to cooldown themselves. They need the world to go fast while they “sleep”. The cryonicists anticipate and harness the acceleration of the changing world, and as they are quick to point out, when cost and stability of electricity to run cryopreservation facilities are questioned, the nitrogen-filled dewars are not power driven, and since the process of creating liquid nitrogen, they say, is cheap and efficient, energy consumption is not seen as a problem for the cryonicists. This points to how my interlocutors have a completely different view of an overheating of the world than for instance that of environmentalist activists.

My interlocutors seek to move beyond space-time compression and an overheated world by anchoring themselves in a completely different temporality; one where the really long term is more important than the place and time of the present or the near future. They anchor themselves not by giving life a divine meaning or looking to past ancestry and personal roots but by securing a place in the real long-term future. In a place where time, which in the present is sped up too fast to experience all the different spaces of the world, is plentiful and space is wide open. Exactly because cryopreservation is not, as mentioned above, about immortality, life is still a timed project. The time is however not random, not lacking, but at a chosen pace. Life can end on one’s own terms. One of my interlocutors reflected on how elderly people, including their own parents, often express they have lived enough and are content with the lifetime they have. The interlocutor said they also hoped they would be content with their lives when they were older, and maybe even not feel the need to live longer through cryopreservation. Thus, to some extent, cryopreservation gives you, as they see it, the choice to live longer if you are not content with what life has given you.

Cryopreservation is thus a practice which comes out of the technological developments in the time-space compressed world and the cryopreservation providers and research labs require this sped-up time, and the constant new advancement and developments in technoscience to offer their services and advance the field of cryopreservation. Exactly because of the ephemerality of the present, cryopreservation predicts and promises a future of permanence.

Prophecy and money – Near and long-term futures

As mentioned above there is something paradoxical in cryonicists’ realism in the fact that revival might not happen combined with their faith in the “wonders” of science and unlimited possibilities. Compared to religious expressions and promises, this paradox becomes even more prevalent. In Christianity, especially for Pentecostal and evangelical Christians, miracles

might not happen, they *will* happen. The second coming and the return to life is unconditional. They live in a space where there is a “natural” expectation for miracles and for the second coming of Christ in particular (Eriksen, Blanes, and MacCarthy 2019). They do not believe in this just to be on the safe side, or to “not lose out”. On the other hand, both cryonicists and Pentecostals hope for an unlimited and miraculous future. Their hope is however very different: cryonicists believe that science will deliver what is promised. Pentecostals believe in God. The first is a rational belief, one based on reasoning, on what they think is a possible, or even likely, outcome. The other entails letting go of reason and science and believing in forces beyond the material ones. They both, however, share a specific perception of time. We can call it eschatological time (see also Eriksen 2021, 2023; Farman 2020). Let me now unpack what this specific experience of time entails, with the aid of Jane Guyer’s analysis from 2007:

Jane Guyer (2007) argues that during the last couple of decades, a significant change in perceptions of time has occurred, which is (most) visible in macroeconomic theory and in evangelicalism. Whereas the 1950-60s were dominated by a perception of what she calls the near future, a more long-term future has gained significance in the last couple of decades. This long-term future is coupled with what she calls an “immediate future” and punctuated time.

Guyer’s main focus is on the economic politics of monetarism. This is an economic strategy where the state regulates the supply of money to make sure the value of money, through inflation and deflation, is kept reasonably stable. In times of high consumer demand, when there is a risk of inflation, central banks will try to limit the circulation of money (by increasing the interest rate). And vice versa. This focus on a stable value of money requires a long-term horizon. It is exactly the long-term horizon which legitimises the economic policies of the present. Keeping the long-term horizon possible requires an intervention in the present market of supply and demand. This is necessary, following the theory of monetarism, to keep up the faith in the free market and for sophisticated financial instruments to create economic growth. Guyer points out that:

“So, through the concept of growth and the technologies for management of the money supply, monetarism moves the near future out of the limelight that it once occupied in economics theory and, at the same time, evokes a strange new economics subject; one who can be rational, submissive, ingenious, and indefinitely desirous all at the same time.” (Guyer, 2007, 413)

This neoliberal economic subject thinks of freedom in terms of choice, in the very short run, but is anchored in notions of the distant future (“ways of life”) (Guyer, 2007, 414). The current choices made for the short term are promising a certain life in the long-term future, such as investing in a property (which requires a choice here and now, in order for the economic return in a distant future), or in cryopreservation (which requires a parallel choice here and now but with a potential return in the very distant future).

Guyer points to evangelicalism, or more specifically third wave Pentecostalism, as the movement that is most similar or parallel, in its reckoning, or “inhabiting”, of time. Anthropological studies of these branches of Christianity in the 1970s showed changes in thinking of time. More precisely, the studies showed what Guyer calls an “evacuation of the near future” to live in “the time that remains” or in a pause, “living in parentheses” of a prophetic time. They put their life on hold in expectation of a much better life after the second coming, i.e., the return of Christ. The present is in between the first and second coming of Messiah for evangelical Christians and is the only dispensational age between the two eternities, before and after time, which has no definite length in the scriptures (Guyer, 2007, 414). They leave the near future empty, awaiting the promised eternity. This, Guyer points out, seems to be the religious counterpart of the secular monetarist policies. In macroeconomics and in Pentecostalism, with very different internal logics, the near future is evacuated.

Guyer goes on to suggest the near future is being reinhabited by forms of punctuated time. There is a rising awareness of time as punctuated rather than enduring, Guyer argues. “[...]: of fateful moments and turning points, the date as an event rather than as a position in a sequence or a cycle, dates as qualitatively different rather than quantitatively cumulative.” (Guyer, 2007, 416). The idea of a unique date conceals the importance of extended circulations, says Guyer, a date becomes a “use-by stamp”. A date takes on meaning as a payment being due, a collective trauma which happened, and people are embedded between compliance and delay, synchrony and avoidance, and the possibilities of future and past, argues Guyer (2020, 417).

My interlocutors’ temporal thinking run parallel to this long-term and immediate future. As with monetarism and evangelism, a long-term future is the goal for cryonicists, and as with the evangelical Christians, the “living in parentheses” seems to capture some of the cryonicists’ expectations of the post-revival future: Present day life become a space before the eternity. The “buying of time”, as Romain (2010b) calls it, and the promise of technoscientific advancement in the future giving infinitely more life is anchoring cryonicists’ imaginations in

the long-term future. The specific ordering of the near future, the “date-as-events”-thinking, which Guyer points to, is also clearly echoed in my interlocutors fixation on the date they finalise the sign-up for cryopreservation, the end date of a life insurance policy payment, and the date they enter suspension.

The specific focus on the distant future is not only present in the cryonicists biological concerns. The horizon of the distant future is constantly present in everything the cryonicists do. For instance, at the EBF conference, the location of the facility in a “safe and stable” place and how it was built to accommodate future extensions for more patients was emphasized. The patient storage area of the facility is built at an underground level, and we were told by EBF board chairman Kendziorra it could be extended on three sides to become more than three times bigger. Switzerland was called a good country to be in because of its political and economic stability. The geographical location in the north of Switzerland was also called good and stable, being away from high seismicity and in a temperate climate zone with lower chances of extreme weather. The cryonicists live in a landscape of very long-term horizons. Revival trusts, preserving capital value into the long-term future, is also a way cryonicists focus on the distant future.

Time and death – changes in biological temporality

There is something specific to the idea of freezing the body, to thus exit from time in a very concrete way, which is not necessarily captured by the idea of space-time compression (Harvey 1989) or the distant future of eschatological time (Guyer 2007) that requires further analysis.

Farman (2020) discusses how the body’s biological temporality is affected by the liminal space between life and death created by cryonic suspension. He argues that; “[...] time and body are mutually mapped and (...) a particular secular history, set of cultural practice, scientific experiments and ideas, and medical dispositifs have generated temporal experiences.” (Farman, 2020, 122). Imaginations of time are closely linked to death as an endpoint and bodily processes of decay. Human time is thus a time of biology; with an endpoint, according to Farman. Nonhuman unfolding of temporalities such as moon cycles and seasons, and the age of the universe, planets and fossils opens a very different dimension of time - one with no endpoint, a non-linear time. The idea of an eternity, beyond the individual human, create (self-)awareness of the mortality of the individual human, says Farman. Changes in timekeeping technologies create new conditions for understanding the

relation between the individual (biological) human and that which is beyond it: that which is not bound by biological time. Measures and changes in life expectancy and mortality rates and the growing field of research on ageing, life extension and rejuvenation medicine produce new types of time and (hopes for) continuity beyond (or even free from) biological matter. Temperature control, specifically cold temperature, is one of the most important ways biological temporalities have been changed, says Farman. Slowing down metabolism and change in biological matter through cold temperatures entails new meanings, experiences of time, and new perceptions of how and what “the end” is, according to Farman (2020, 121-123). Farman sees cryonic suspension as creating a space of translation between biological and chronological time. The secularisation and naturalisation of time, together with a biological understanding of life and ways to manipulate it, which can be seen in cryonics practice, have changed the relation between death, the body, and time, Farman argues. Cryonic suspension entails life translated into time. Suspending life (in cryonics suspension) entails suspending time. It entails a freezing of time: a mastering of time. Biological time is neutralised and the only time remaining is that of the non-biological time; the ongoing of the world. Farman points out that:

“[...] suspension is made possible by *and emerges as meaningful through* the broader historical and cultural relation to finitude and infinitude [...] the cryopreserved body’s material continuity in indefinite time is made possible through the technical suspension of its biological life, but the cultural meaning of that suspension – the possibilities, desires, and horrors it evokes – emerges in the ongoing time of the world which is slated to keep moving on after lives expire, leaving everyone, every life-time, behind.” (Farman, 2020, 131)

Cryonicists do not want their life to expire. They see an opportunity to not be left behind, not accepting life in finitude and reaching for infinitude. They want to take part in (a) time which is beyond the human (biological) time.

Farman goes on to argue that “[...] different eschatological frames and conceptions of the afterlife (or lack thereof) have an effect on lived time and that the afterlife is experienced and used also as temporal strategy.” (2020, 141). Describing the secular eschatological Farman draws on Weber’s concept of disenchantment and the meaninglessness of death to “civilized man” where progress is in the centre, but the individual life is only part of a set time on the ever-progressing, infinite timeline. Thus, in a materialist worldview, where life is only biological, and the death is final (thus no *after* life), life becomes a timed project. Life in a disenchanted world will always be surpassed by new life and progress, and will therefore be

subject to failure, says Farman (2020, 139). The concept of the “disenchantment of the world” was used by Weber (2009[1930]) to describe the increasing intellectualization and rationalization through secularization which in principle takes away all mysterious and incalculable forces, such as magic and spirits. This entails, in principle, the mastering of everything through calculation. This disenchantment, the occidental view of progress through science has existed in Occident culture since the ancient Greek philosophers, through the Renaissance, the Enlightenment and to Modernism and the secular age, according to Weber. Drawing on Tolstoy, Weber argues that to a “civilized man” death has no meaning as his life is placed on a line of progress which has no end and will continue after he is dead. He may become “tired of life” but will never become “satisfied with life”, and because his death is meaningless so will his life be (Weber, 2009[1930], 139-140). In other words: for the mortal human the limit of their life is obvious in the encounter (and realization) of the time that will always progress, what Farman calls “chronological time”.

Cryonicists who wish to see the future progress of science and technology, which seem to be the main motivation for cryopreservation among my interviewees, need to be understood in this context of the disenchanted world and in the context of a specific perception of time. This time is always limited, but also always different from chronological time (the time that just always progresses). It is an attempt to master more of life’s calculability and make life an untimed project. It is an effort at becoming part of that other time which is beyond biological time. There is a temporal paradox, according to Farman: “It is not that humans once felt infinite and immortal but suddenly came to feel engulfed by mortality; rather, the awareness of mortality and its consequences was transformed by the change in the conditions of knowledge and experience.” (Farman, 2020, 144)

This awareness of life as ending, for many an end coming too soon without feeling that all the potentials of life have been lived out, which according to Weber leads to meaninglessness, is being mitigated by cryonicists through the cryopreservation. It entails a freezing of time and the futures potential of indefinite life. Cryonics can be seen as a “chronobiopolitical” practice which bridges the eschatological gap materially, argues Farman. “The cryopreserved figure [...] becomes the material index of a chronologically indefinite bios, an open future relinked to the body whose time was supposed to have been up.” (Farman, 2020, 148) The frozen body is brought into a new space with a different sociality and culture creating a new temporal experience. When taking part in cryonics training at Alcor Farman was struck by how the small difference between the two letters R and S takes on a lot of meaning in the distinction between CPR and CPS. The instructor at the training

told them not to give the training dummy too hard chest compressions as it could potentially restart the heart of the cryonics patient. The CPS is to keep the blood of the patient oxygenated throughout the body, it is cardiopulmonary *support*, not cardiopulmonary *resuscitation* (CPR), said the instructor. This slight difference between the two letters opens up a third liminal space between the two brackets of life and death, a space occupied by the infinite suspended cryonicist, argues Farman (2020, 127-128).

At the trainings I attended, I also took note of the small differences between life and death, in the CPS and also in the administering of the anaesthetic drug Propofol. The use of anaesthetics was mentioned first at the presentation of cryopreservation and the technicalities of how Tomorrow plan their cryopreservation procedure I got during the first week of my stay at their office. Dev, one of Tomorrows medical professionals, were giving the presentation to all new hires at Tomorrow and I was present together with two newly hired interns. Showing a document of Tomorrows work-in-progress protocol of cryopreservation on a computer screen, Dev scrolled through the pages pointing out the key steps of the cryopreservation procedure. When he got to the part about drug administration, he said they give the patient mainly two types of drugs. One is anticoagulants to prevent blood clots which could be in the way and cause damage during the perfusion, when the blood in the body is replaced with the cryoprotectants (anti-freeze). The other drug is the anaesthetic Propofol which he said is given “to make sure they don’t wake up.” It is a very slim chance of it happening, but since they are giving the patients CPS it could technically happen, he said. The use of Propofol was also mentioned at the Cryonics UK trainings I attended and the phrase “to make sure they don’t wake up” was also used there. One of the Cryonics UK volunteers also pointed out that the patients likely will have signed a DNR (do not resuscitate) before they legally died, so for the cryopreservation team to wake up a patient again would be against the DNR and illegal. When the legal death has occurred, the cryopreserved subject is entering into the indefinite suspension and set on pause, waiting for the time of indefinite life the future potentially can give them. Skipping the end of life, for the time being, implies jumping the eschatological gap created by the lack of a secular afterlife, to the continued life in a timespan of their own choosing.

Life without an end date

So, life without an end date, why not? “Why not” is an answer I heard many times from cryonicists. When life is too short why not try and change it? When the future probably will

be a “better” place than the present, why not experience it? When there is a possibility of not dying, why not take it? When there is a possibility for a life with all the time you want to have, freedom from the pressure of time, why would not everybody want that? The technological and scientific exponential development over the last century, and the expectations of continued exponential acceleration into the next century, promises the realization of cryopreservation of human life. The temporality of the present is according to Guyer, Farman, and Harvey, speeding up and ever-changing making the long-term future far away and imagining and planning in the long-term difficult. Even though life expectancy has gone up by many years in the last century, time is felt as if it is becoming shorter, and life becomes too short. In the time-space compressed world space is near and time is fleeting. Through the static stage of cryonic suspension, a new temporality in a new future space is promised. Escaping the path of the current expected lifetime, cryonicists want to see how the world and its technoscience evolve in the long term, live in a timeline of their own choosing, and have the freedom to set their own end date, or not set an end date at all.

On the one hand, time-space compression and the idea of a world just running faster and faster can help us understand why and how cryonicists try to expand time: to *choose* life span. As my ethnography shows: they are not so much talking about immortality, as they are talking about expanding time. They just want *more* time. It is not necessarily a craving for a life without *any* end. They just want much more of life. The mechanisms whereby they manage this expansion of time, is to anchor themselves in the rational “belief” in exponential scientific and technological development which will dramatically change what life is, and death is, in the distant future. Cryopreservation thus mirrors monetary politics and expectations of Pentecostal Christians, in their management of everyday life in the near future through due-dates: sign-up, insurance, payments etc. Their gaze is set not only on what they can do next year, but what they can do in decades from now, or maybe even several hundred years from now. On the other hand, this time, seem to be, as Farman describes, detached from the “normal” time, the biological time. In freezing time, they are trying to move into another kind of time, a time that is eternal (seasonal, cyclical, ongoing etc.) and not linked to the “biological clock”. However, my interlocutors are perhaps less interested, and at least less outspoken about, this “other” time, that exists outside of biology compared to Farman’s “immortalists”. They do not want to end biology, just prolong, and control biology. They just want biological time to slow down, so they can *do* more. Perhaps they are not so much freezing time to move beyond biological time as they are trying to shift gear: to gain a

biological time that is expanded, moves slower, and takes on another structure: paused or freezed and reenergised.

Chapter 5: The anthropological study of cryopreservation as (not) religion – the technoscientific human

What type of phenomenon is human cryopreservation? Studies of what has often been called immortalists (Farman) or technoscientific forms of immortality (Bernstein 2019, Eriksen 2020, 2023) have often been done by scholars with a background in the Anthropology of Religion (Bernstein 2019; Bialecki 2022; Eriksen 2020, 2023) or secularism (Farman; 2020). Cryopreservation and transhumanism have for instance been understood as “religious work” (Eriksen 2023), moving beyond biology in answering what the human is and its place in existence. However, in my own ethnographic material there is little that point to capture existential contemplations, and the term “religious work” does not capture the sentiments of my interlocutors. They do not strive for the immortality described in other studies of cryonicists (Farman 2020; Bernstein 2019). It is the chosen life span my interlocutors seek. Cryopreservation is on the one hand a matter of science, of biology, and technology. On the other hand, it also opens questions about life and death that easily can take on religious dimensions. It balances on the border between biological control and biological extinction, between doing science and doing “religion”, and thus between questions asked by the Anthropology of Medicine and the Anthropology of Religion. In this final chapter I delve deeper into the more theoretical questions that my ethnography opens, and the discussion on how and in what way cryopreservation can be “only” about science and biology (for my interlocutors) or whether there are also other dimensions in play. I discuss where my ethnographic material of European cryonicists can be placed within anthropological debates of the human being.

First, I look at David Chidester’s (2005) theory on how religion negotiates what it means to be human, before moving to John Bialecki’s (2022) work on *theosis* through technoscience in Mormon transhumanism. I take these two theories and discuss it against my ethnographic material. Then I turn to the concept of medicalisation, individualised health care, and cryopreservation of embryos and eggs which have been discussed within Anthropology of Biomedicine (Lock and Nguyen 2010; Romain 2010b). I end with a discussion of my ethnography in relation to these theories on biomedicine.

Religion after religion – science and pop culture as religion in America

Scholar of comparative religion David Chidester described what he calls the “religious work” of pop culture in America in his 2005 book “Authentic Fakes – Religion and pop culture in America”. According to Chidester religion is;

“[...] discourses and practices that negotiate what it is to be a human person both in relation to the superhuman and in relation to whatever might be treated as subhuman. Since being a person also requires being in a place, religion entails discourses and practices for creating sacred space, as a zone of inclusion but also a boundary for excluding others.” (vii-viii)

With this definition Chidester explores the sacred institution of baseball and its magic, the world-wide mission and fetishization of Coca-Cola’s sacred object, and rock ‘n’ rolls ritualized performance of sacred dramas. None of them can be defined as religion but the reminisce of the church, the fetish, and the potlach, do a form of religious work, argues Chidester. What is authentic and what is fake rises as products of popular culture that seem religious, but they are not actually religious, say Chidester. However, many religious activities have been denied as religions, such as indigenous religion labeled as superstitions. Fake-religion is another example; this is religious activities which appears fake, such as “internet-invented” religions. However; “even fake religions can be doing a kind of symbolic, cultural, and religious work that is real.” (Chidester, 2005, 9). The fake and inauthentic can also do religious work.

In Chidesters’s view religious work is found when something or someone is engaged in negotiating what it is to be human. Using the Human Genome Project as an example Chidester looks at the ways science can be given religious meanings. The Human Genome Project, the sequencing and mapping of human DNA and generating it into a computer code suggests all humanity is information. A biological life is found in its genetic code. When the Human Genome Projects was made known to a broader audience, scientists, politicians and publicists used religious symbols and language to popularise the scientific discovery. U.S president at the time the sequencing was announced, Bill Clinton, said “Today, we are learning the language in which God created life.” (Chidester, 2005, 64). Director of the project, Francis Collins, a devoted Christian, said it was the first glimpse of the instruction book which previously only God had known. Scientists have likened genes to God,

supernatural beings with the power to control the course of nature and human life. As the human genome is 99% the same as chimpanzees the human can also become animal-like. DNA has also been said to take on the social and cultural functions of the soul, in biological determinism, as the location of the true self. Scientists can be seen as entering the domain of God when working with this new genetic discovery (Chidester, 2005, 64-65).

In American popular culture almost anything you could think of is possible. What the human is have been created in the diverse myths of America. Between the extremes of possibility and authenticity, through machinery of production, consumption patterns, and sacred artifacts lie the field of American religion and pop culture. In the end chapter of his book Chidester argues that religion can be found in both unconscious dreaming and conscious action in American popular culture.

Farman (2013, 2020), on the other hand, as mentioned in the previous chapters, argues that secular institutions, such as science, have taken the place of religion in explaining what humans are, but does not fully cover all the ground religion once did.

Instead of asking whether this is a religion or as a religion (building in Chidester, as Eriksen 2023 does), or the opposite (as Farman 2020 does), perhaps we need to ask : under what material and ideological conditions transhumanism and religion can be seen to mingle, fuse, and become something(s) else, as Bialecki (2022, 33) does in his new book on transhumanism and Mormonism.

Religion and transhumanism

After exploring the implicit connections cryopreservation and religion might have, let us now explore some of the explicit connections in studies of religious transhumanists.

Anthropologist John Bialecki (2022) has studied the Mormon Transhumanist Association, which is a group which is quite special in the transhumanist context. They are explicitly religious. Mormon transhumanist draws parallels between the Mormon idea of *theosis*, becoming God-like, and transhumanist ideas of transcending the human. Bialecki argues that Mormonism and transhumanism rhyme with one and other not just because of Transhuman aspiration and suspensions against outside stress, but also their Americanness. Neither are exclusive to America but they both are full of “settler-culture romance of the frontier” and strong speculative reason (Bialecki, 2022, xv). America has both been a geographical and metaphorical frontier since the first European settlers running from religious prosecution to an open, “untouched” space with endless freedom; freedom to think new and

reconfigure human life both within different religions, such as Mormonism, and outside it, such as transhumanism.

Discussing the relation between science and religion Bialecki (2022) points to how they have been seen as both competitors in addressing existential questions, a power previously held by religion alone, but also as complementary in being separate modes of reasoning and understanding. However, as science in the last few centuries advanced and started offering its own end-of-time scenarios and the human's special place in the world order was lost, human existence was made meaningless. Referencing Farman's (2020) concept of "Cosmological Collapse", where religion is gone but the secular has no real replacement for the cosmological meaning of human existence, Bialecki says this cannot be a totalising claim and that science cannot be seen as a homogeneous entity. Claims about science's relation to religion must be about particular communities and not science, argues Bialecki. One such community, Bialecki found in Mormon transhumanists, where the idea of creating the transhuman through technoscience is the way of achieving promised *theosis*. Transhumanism (and Mormonism and Mormon transhumanism) is entangled in a "[...] messy, open project of not just fulfilling their humanity but overcoming it. [...] (which) open up issues of the current arrangement between and structure of science/scientism and religion" (Bialecki, 2022, 48).

Summing up this far: what has been written about cryopreservation has diffused the relation between science and religion from different points of view. Described as a means of reaching immortality, cryopreservation has been seen as "doing religious work" (Eriksen, 2023) and as filling the void religion left behind when secularisation located what the human is in science (Farman, 2020), and as an open and messy project realigning science and religion (Bialecki 2022)

More life, not immortality

My interlocutors, however, do not (explicitly at least) want immortality and indefinite life, they just want *more* life and the control of their own chosen life span. My interlocutors do not express ideas of becoming something more, something transcendent that can be achieved in cryopreservation. As mentioned before, very few of the cryonicists I met self-identified as transhumanists. Some of my interlocutors spoke of having artificial bodies after being revived in the future but they did not connect this to becoming a transhuman. Most of my interlocutors just want to keep their individual life and humanity for longer than they currently are able to.

Unlike Farman's immortalists, immortality is not their goal. More life, and choice, are their goals.

Chidester's, Eriksen's, Farman's and Bialecki's ethnographic studies are located in the United States, and as Bialecki points out; there is something distinctly American with the transhumanists he encountered. Maybe there is a difference in the (central/north-western) European context where I conducted my research. What this difference could be I have not been able to cover through my own material, and is not something I can cover in this thesis, but I suggest the position of religion in popular culture and America as the land of open possibilities might play a part. Put very simply; the role of religion in America is very different from religion in Europe, not least in terms of new religious movements, so maybe it is not so surprising that the relation between cryopreservation, science and religion is different in Germany and the rest of central and northern Europe.

I find it very unlikely that any of my interlocutors would state that God had anything to do with DNA, or that the human defining, life and death altering, research scientist do is interfering in God's domain, which Chidester argues some scientists do. Science is by my interlocutors seen as a separate realm from anything religious. This is an important part of the work Tomorrow and EBF does, in the way they speak about and practice cryopreservation as a scientific, biomedical endeavour. This was especially evident at the EBF conference, described in chapter 2, in the scientific talks and medical facilities, and in Tomorrow's conversations with potential customers and the use of informed consent. It was also conveyed in my interviews with Tomorrow customers', in their very down to earth, and even "rational" perspective on cryopreservation and why they want to be cryopreserved. Cryonics UK also showed how they view cryonics as technoscience and work to keep it in the realm of biomedicine; through their new initiatives to have medically trained professionals as part of their cryopreservations and discussions of how being seen as professional would better their service, as well as the general public perceptions of human cryopreservation.

The medicalisation of death

Let us now turn to Anthropology of Medicine and the concepts of medicalisation, individualisation, and life preservation and set these perspectives in conversation with my ethnography.

Medicalisation is used in social science to discuss the growing importance of biomedicine in everyday life during the late 1900s (Lock and Nguyen, 2010, 67). Literally

medicalisation means “to make medical” but it has been used in social science since the 1970s as a critique of an “overmedicalisation” where more and more of everyday life has come under the medical domain, says Conrad (1992). “Medicalization consists of defining a problem in medical terms, using medical language to describe a problem, adopting a medical framework to understand a problem, or using a medical intervention to “treat” it” (Conrad, 1992, 211). Contextual aspects of secularisation and the changing status of the medical profession have affected medicalisation, argues Conrad. “Biomedicalisation” has been used to describe recent changes of medical treatment in life-extension of aging patients where the life-extending treatment has become routinised. Medical intervention late in life is rendered normal and natural in the imperative to treat and hope for ever more extended life, outweighing the alternative of choice and stopping treatment late in life, says Lock and Nguyen (2010, 71). As shown in chapter 2, advancement in medical technology and science have shifted the definition of death in medical terms in the last century, and this process of redefinition was kept within medical professional circles in Euro-America.

Lock and Nguyen (2010) points to how health as an individual right has a long history in Europe. The nation-state managed health care system has since the 19th century been important in most of Europe, Japan, Canada and Australia, which later was followed in many other parts of the world. The United States is an exception to this, and only give state supported health care to certain individuals, mainly elderly and very poor, though this might change as universal health care is a much-discussed topic in US politics. As medical care has been highly standardized across the world, it settles the idea that the biological body is the same everywhere, says Lock and Nguyen. They argue, however, that the body is contextual and this can be seen in “local biologies” and points to how individuals differ in respect to acquiring disease and response to medical treatment. In addition to the trend of the individual right to health care, another trend emerged in the 19th century which has become very powerful, says Lock and Nguyen; the idea of being able to improve upon individual health and wellbeing. Health, they argue, thus became something individuals can change and control, not something finite and God-given. Elsewhere Lock argues that; “A space/time compression has facilitated our ability to manipulate individual bodies – we focus on molecular change, and target what we define as the abnormal.” (Lock, 1997, 9).

In the context of the medicalisation of death and health as an individual matter present in perceptions of medical care in Europe since the middle of the last century, new technoscientific inventions have emerged and changed human life, especially its beginning

and end. However, as Lock and Nguyen reminds us, it is important to note that the use of biomedicine to overcome perceived physical and biological abnormalities are restricted to those who can afford it.

Within transhumanism the idea of converging the biological and nonbiological is seen as a way of “fixing” the biological body and its current “medical” problems, and has made its way into mainstream science in Silicon Valley, says Farman (2019). The solution to medicine’s ultimate goal of longer and healthier lives (and for an Immortalist an end to involuntary death) is to be found in NBIC (nanotechnology, biotechnology, and the informatic and cognitive sciences) convergence according to both transhumanists, and an increasing amount of non-transhumanist scientist, argues Farman. NBIC science and technology is, as mentioned in chapter 3, also present in the context of the 4th industrial revolution and financial climate in Europe which encourages establishment of bio tech companies, such as Tomorrow. Asking what a nonbiological definition of human might do to health and health care, Farman, looks to immortalists projects, such as cryonics, “mindfiles” and digital avatars, and how human life is biologically independent and becomes information and algorithms. “[...] in the world of *Homo sapiens siliconis*, what kind of a medicine man will a hacker be?” (Farman, 2019, 180). Whereas “medical hacking” might seem far away, the technoscience “fixes” of the medicalised human life, e.g., organ transplant, pacemakers etc., are part of everyday medical practices today.

Freeze and let live (again) – Managing time and potential

Whereas human cryopreservation has not been much studied by anthropologists, cryopreservation of embryos and eggs have been studied for the past few decades. Focus has been on how politics and ethics have influenced the development and local regulations of these new technologies, the potential exploitative dynamics of egg donation, and the temporal aspects of freezing and extending potential life and motherhood (Martin, 2010; Roberts, 2011; Romain 2010b; Birenbaum-Carmeli et.al., 2021). “Egg freezing is a concise illustration of how the medicalization of women’s bodies and bodily processes masks a host of cultural anxieties about aging, illness, reproduction, and risk.” (Martin, 2010, 527). Franklin shows how IVF is portrayed as a “hope technology” where failure and success rates are continuously redefined, where “hope management” is a very important part of the technology (Lock and Nguyen, 2010, 265).

Romain (2010b) has studied both human cryopreservation and embryo and egg cryopreservation and argues that they all can be understood as part of the same economic reasoning, that of “buying time”, as I discussed in chapter 3. The patients using IVF-treatment and the medical staff in fertility clinics describe the embryos and oocytes (eggs) in terms of “potential”, argues Romain. There is potential hope and potential anxiety in the frozen material. Hope to have a future child. Anxieties about the embryo being able to develop into a child or not, and whether to donate unused embryos to other people or science or destructing the unused cryopreserved embryos (Romain, 2010b, 97). There is a potentiality of life with the IVF treatment, which patients invest in to gain an extension of life, however not their actual own life, but through ancestors.

Oocyte (egg) preservation, Romain argues, is a way for single, professional women possibly to “have it all”. As the women also expressed how cryopreservation of their oocyte gave them time in search for what was ultimately out of their control; “true love”, Romain argues, that the women have a hopeful orientation towards an uncertain future. They are doing a highly calculated move in making possibilities open to them, and at the same time surrender and acknowledge things are out of one’s control (Romain, 2010b, 101).

Egg and embryo freezing of potential life is in many ways the same as human cryopreservation. Both are used as time controlling mechanisms. Both are a response to anxieties about not living a “full life” and losing potential life experience. The single businesswoman “wants it all”, and so do the cryonicists I meet. They express not having time to experience all they want to experience in life, and actively seek to do something about it, to change their own life span. However, where the cryopreservation egg and embryo is an accepted part of the biomedical field, human cryopreservation is still working at the borders, trying to get acceptance in the field. My interlocutors would probably say it is just a matter of spreading awareness and achieving a few more advances in the technology before they are there. Human cryopreservation will soon be an accepted and legitimate part of proper science. This is their hope, at least.

Towards the control of life(time)

As death has become medicalised and increasingly treated as a biomedical problem in Euro-America, it has become available to technoscientific fixes. My interlocutor’s perception of personhood and self as something located in the brain, and thus as something reducible to organic and biological matter makes cryopreservation a “natural” continuation of any other

treatment of ailments. I argue that the information-death theory might thus be seen as a version of the medicalised individual.

The individual responsibility for health can be seen as an individual responsibility for life and death, and cryopreservation become a way of dealing with that responsibility. Difference in health care systems in Europe and the United State gives different expectations to health as a service. In the tech-optimistic, innovation-driven context of the 4th industrial revolution the biotech industry Tomorrow is a part of, new ways of living and dying through technology are found. The ideas of investing in technologies of rupture; technologies that will change everything creates fertile grounds for cryopreservation and similar “life-altering” technologies.

I have also shown, in the previous chapter, how the cryonicists expresses an experience of time moving too fast, being unable to experience all the world has to offer them, as well as the wish to be present in a technologically advanced and potentially better future. Thus, my interlocutors use cryopreservation to manage their time and life experiences, pausing death to gain potential extended life, much in the same way cryopreservation of eggs and embryos are used, pausing fertility to gain the potential life experience of motherhood and extended life through ancestry.

The cryonicists I meet do not seem to want to transcend the human into a “higher” entity or transcend from biological time to one of more cosmological dimensions, as Farman has argued. They are not concerned with the cosmological collapse, and the eternity that is lost in the disenchanting world of modernity, and secularism. They just speak of tinkering to make the unmeaningful death controllable. As the cryonicists hope for a better future, their choice of actively handling their death might point to trends in how human life has become malleable and open to change in the secular, biomedical perception of what the human is in a Euro-American context.

So, can cryopreservation and cryonicists tell us something about the conditions of the time we live in? The tech-optimism, solutionist approach to change and progress of human life and death, as I have pointed to, can be found in wider secular and biomedical based imagines of what the human is today. The younger generations today have grown up with exponential technological (especially online and virtual) change. When there is always a new and improved version of a phone, chat-bot, or social media platform, when the latest update will fix the “glitch” (fault) in the system in a few seconds, what happens to the ideas and expectations of solving problems and speed of progress? When the limits of life and death are being negotiated by means of technoscience, what future life and death is being created? I

have studied what many would call, and many has told me is, an extreme idea, but my interlocutors say they are just a bit ahead of most people. They are just open for the inevitable change and progression of humanity.

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