Translated excerpt

Moritz Riesewieck / Hans Block
Vom Ende der Endlichkeit
Unsterblichkeit im Zeitalter Künstlicher Intelligenz

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Moritz Riesewieck / Hans Block
The End of Mortality
Eternal Life in the Age of Artificial Intelligence

Translated by Gesche Ipsen

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Chapter 0: The Beginning of the End of Our Mortality

Digital Immortality

There's a life before and a life after. Even for those among us lucky enough not to have lost friends or family, the Covid pandemic has had a significant impact on how we think about mortality. Like no other event before it, Covid has shown us just how vulnerable our bodies are, and that we and our loved ones can perish in the blink of an eye – including those privileged enough to have so far remained untouched by incurable disease, accidents, war or starvation. Death has entered our collective consciousness with a vengeance, and brought with it for many of us the realisation that losing someone you love is utterly agonizing and overwhelming if you have no salvation myth to console you. Because of the protective measures that were in place in hospitals at the time, many of us were unable to say goodbye to our dying partners, relatives and friends, unable to be by their side during their final hours, unable to mourn them properly. Moreover, as we went through these terrible experiences we acutely felt the lack of collective forms of mourning – forms that religious rituals have provided us with for centuries. Many of us have become aware only now of how under-equipped we are to cope with the remorseless finality of loss, without the comforting thought that there's life after death. For the millions of us who don't believe in some religious myth of deliverance, the death of someone we love is an unbearable tragedy.

It is one of the oldest questions in the world: what happens to us when we die? For centuries, most people in the western world thought the answer was clear: our souls ascend to God in the Heavens, or roast in Hell. But recent studies have shown that fewer and fewer people in western Europe believe in God, or in eternal life in some Great Beyond,[1] and only a minority think of themselves as religious.[2] Only few, however, believe that there is *no* life after death at

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[1] This is the conclusion of a study conducted by the renowned US polling organisation Pew Research Center between April and August 2017 among 24,500 adults from 15 western European countries: https://www.pewforum.org/2018/05/29/religious-practice-and-belief; the French sociologist Pierre Bréchon has come to the same conclusion in his research into the evolution of religious faith among Europeans, for which he used the European Values Study survey, which is conducted every ten years: 'Organised religion is losing more and more followers, and becoming less and less useful' – see http://condorcetsavoie.e-monsite.com/medias/files/measuring-religious-indifference-in-the-international-sociological-quantitative-surveys-article-en-anglais-.pdf.
[2] https://www.pewforum.org/2018/05/29/attitudes-towardspirituality-and-religion.

all.[3] We obviously find it hard to stomach the thought that our souls may not continue to exist after death. As yet, we have no (secular) salvation myth; we have yet to make up for the loss of meaning felt by billions of people ever since we started turning our back on religion. An immense gap has opened up – something that hasn't escaped the notice of the tech companies, which have seized this gap as an opportunity for the next big business idea. There are billions of potential customers willing to embrace a new, contemporary 'message' that will free them from the inevitability of death; and start-ups all over the world are travelling in the slipstream of the digital revolution, competing for a mammoth market – the market of *digital immortality*.

For the past fifteen years, we've been communicating with each other around the clock via social media platforms and messaging services. We reveal every facet of our character in WhatsApp conversations, and transmit daily streams of consciousness to our smartphones. From Shenzhen in China via Iaş i in Romania to Pasadena in the US, developers around the world are working on ways of using this wealth of personal data not only to distil personalities, but also to mimic our behaviour patterns with the help of artificial intelligence. Their aim is to keep our personalities alive beyond our physical death. This may sound like the plot of a sci-fi movie, but it's not far off being a reality. But what lies behind these questionable proposals? How exactly does the technology work? What kind of a person stakes everything on becoming digitally immortal? And what happens to those who attempt to raise loved ones from the dead – as digital clones?

To explore these questions, we travelled halfway round the world to speak to the pioneers searching for immortality far removed from any religious notions of eternal life, and have met people who are dreaming about, and working on, making *digital* immortality a reality: people who resurrect their dead fathers on smartphones; people who, for decades, have been recording the minutiae of their lives; people toying with the hopes of hundreds of terminally ill people, by suggesting that there's hope of an afterlife; and people who produce virtual doubles of themselves, or others, with the help of a Chinese tech giant. We've also spoken to leading experts at brain research centres around the world who believe that neuromorphic computers can generate artificial consciousness, and to programmers who have granted us insight into the workings of artificial neural networks, and explained how we can produce synthetic beings. In this book, we will tell you about our encounters with dreamers and creators, the desperate and the euphoric, the bold as well as those who worry about the effect this seismic change will have

[3] According to a 2018 Pew Research Center study, Belgium, Denmark and Sweden are the only countries where the majority of people agrees with the statement 'When people die, that is the end; there is NO life after death'; in the UK, 36% of those surveyed agree with the statement.

on us. Our journey takes us to far-flung places and deep inside ourselves, as we explore what makes us who we are.

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The Digital Soul

Never in our wildest dreams did either of us think that we'd one day write a book about the soul. We have as little to do with the religious or spiritual world as Donald Trump has with the theory of relativity. The reason that we have nonetheless spent several years examining the soul is a news story from 2015, which caused outrage around the world: researchers at the University of Cambridge announced that merely looking at 300 of a Facebook user's 'likes' was enough to know them better than their own partner does.[4] The news went viral. Big Data – the magic potion that supposedly allows you to understand someone's personality – became a byword, and has been on everyone's lips ever since. Tech companies are making increasingly aggressive inroads into a territory that was for a long time the purview of our gods and lovers: the ability to truly know a human being, to *recognise* them. But why do we, the authors of this book, think that what people's data sets, algorithms and AI shed light on is the *soul* – or, to be more precise, the *digital soul*?

To many of us, the soul is a dusty and speculative concept; neuroscientists deny that it exists, and even psychologists no longer think of themselves as dealing in souls. And yet the soul remains an integral part of everyday language – often without our noticing. We describe someone as a 'kind soul' or 'the soul of discretion'; we put ourselves 'body and soul' into something; two people can love each other 'heart and soul' and be 'soulmates'; something can be 'good for the soul', while trauma can turn us into 'lost souls'; and we sometimes feel that we have 'sold' our 'soul'. Yet hard as it is to erase the soul from language, neuroscientists have banished it entirely from their vocabulary. In place of a soul we now have a *consciousness*, an entity with brainwaves, which, they say, make it much easier to measure. But can you actually prove that someone who is lying in a coma, or even someone who is brain-dead, has no consciousness left – and has lost their soul along with it? The vast majority of us would fervently argue that you can't. When we're under general anaesthetic, deep asleep or in a trance, we don't forfeit our soul simply because our consciousness is temporarily out of action. A person's soul doesn't expire

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[4] See https://www.wired.com/2015/01/facebook-personality-test.

just because it ceases to *manifest* itself.[5] The idea that we have a soul is the reason we have universal human rights declarations and notions of human dignity;[6] the soul lies beneath the human exterior and human behaviour; it stands for human kindness, for our (unfulfilled) potential, for that part of us that isn't easily rattled by the tribulations of everyday life – but can clearly suffer from them. Most of us humans don't want to see ourselves as what, for several decades now, most neuroscientists have been seeing us as: a complex, but ultimately predictable, interplay of biochemical and neurophysiological processes, hormones, brain waves and the world around us. There is little room among all this for the free will we imagine we possess, and even less room for a soul. As we will see later, however, neurology is unable to provide any answers to the most difficult questions about human consciousness, and it can't explain why most people in western Europe are convinced that they have a soul, even as most of us reject spiritual concepts.[7] It looks like the soul is more than a religious or spiritual idea: being *myself* is simply a way of feeling.

Nothing less than our understanding of love depends on the soul. Neurologists say that love is nothing but the product of the effects of dopamine, serotonin and oxytocin.[8] Still, nobody would dream of saying 'You make my dopamine levels rise' or 'You're good for my oxytocin production' instead of 'I love you' – because we rightly sense that, rather than triggering an ineffable phenomenon, these chemical messengers are part of it. It is what it is, says Love.[9] The same goes for the soul. We can't explain what it is in rational terms, but there's surely a reason why lovers feel as if they're *baring their souls* to each other. Even people who don't care a jot about spirituality believe that we are more than the sum of our parts. So why skirt the issue, when there is a term for this 'more' that has been in general use for millennia, and which gets to the very crux of our spirit's inexplicable appearance – namely, the 'soul'? But who is there to invoke the soul nowadays, who sings of it and cares for it when people are increasingly staying away from religious houses? A vacuum has formed, a 'transcendental homelessness'[10] – and since nature abhors a vacuum, we have been trying for a long time to fill it. But our best chance of providing the soul with new meaning lies not with spiritual gurus, with new or Far Eastern

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[5] See Matthias Jung, 'Was bleibt von der Seele' ('What Remains of the Soul?'), in *Psychologie Heute*, 01/2019. https://www.psychologie-heute.de/gesellschaft/39733-was-bleibt-von-der-seele.html?tx_saltpsychologieheute_detail%5B%40widget_0%5D%5B562currentPage%5D=3&cHash=455d8bbfd630252f9c914cabee279837 (£, in German).

[6] See Hans Joas, *The Sacredness of the Person: A New Genealogy of Human Rights* (Washington, DC: Georgetown University Press, 2013).

[7] https://www.pewforum.org/2018/05/29/attitudes-towardspirituality-and-religion.

[8] https://www.dasgehirn.info/handeln/liebe-und-triebe/liebe-ist-biochemie-und-was-noch (in German).

[9] *Pace* Erich Fried's 1983 poem, 'Es ist was es ist' ('It Is What It Is').

[10] The expression was coined by the Hungarian philosopher and literary theorist Georg Lukács (1885–1971) in his *Theory of the Novel*.

religious cults, with esoteric practitioners and suchlike, but with precisely those people who believe that everything can be translated into ones and zeros: the *digital apologists*.

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Grasping at Nothing

Since the dawn of history, man has dreamt of evading death. Human culture is full of stories through which we express our yearning to last for ever. We never can quite accept that we have an expiry date; but while attempts to deliver the human body from death (be it by pickling or freezing it, or by taking anti-ageing pills) remain condemned to failure, today the digital cloning of our very essence – the way we talk and act, even the way we think, down to the minute details – appears to be within our grasp.

February 2013 saw the premiere of a new episode of the sci-fi series *Black Mirror*, entitled 'Be Right Back'.[11] Its plot was an intriguing thought experiment: what if we could make contact with someone who died long ago? What if future technology enables us to raise the dead, first on our computer screens and smartphones, and then in flesh and blood? In the episode, a young woman, Martha, witnesses the resurrection of her deceased partner, Ash. As she mourns her partner's death, someone offers to resurrect the love of her life by using the vast amounts of data Ash left behind on the internet.

What was considered pure fiction just a few years ago is now becoming reality. In February 2020, more than 18 million people watched the nine-minute YouTube video of a South Korean mother meeting her daughter again for the first time since the girl died more than three years earlier.[12] This time it wasn't a TV drama: the South Korean station MBC had uploaded a clip from a new documentary. It evoked sympathy around the world, but many people were also shocked by this daring experiment. Jang Ji-sung's encounter with her dead daughter, Nayeon, takes place in a park: Jang, alone, walks down a path she often used to take with her little girl. Then she hears a voice singing a song she once taught her daughter – and the voice is indeed Nayeon's. The seven-year-old girl leaps up from behind a stack of logs, and runs towards her mother: 'Mum, where have you been?' the child asks. The mother breaks down in tears. She wants to touch her daughter, but grasps at nothing; because the girl standing right there in front of her – who is clearly her daughter: a bright-eyed, inquisitive girl, with shoulder-length black

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[11] https://www.netflix.com/watch/70279173?trackId=200257859 (£).
[12] https://www.youtube.com/watch?v=uflTK8c4w0c&t=21s.

hair held back by the Alice band her mother once gave her, wearing the violet dress she liked so much – the girl who, in Nayeon's unmistakable voice, is asking Jang Ji-sung whether she has been thinking about her, is only a simulation, her daughter's avatar, even if it is almost perfect. Jang knows this. After all, she is standing in a green screen studio wearing a VR headset and gloves that transmit her movements. But Jang doesn't *want* to know that all this is a merely virtual reality. She is here to get her daughter back, if only for half an hour. Again and again, the mother tries to touch her daughter's shoulder, to take her into her arms. Jang's husband is sitting a few yards away with their other two young daughters and slightly older son. Helpless, he watches as his wife meanders about the studio. She sobs. 'I want to touch you, just once,' she tells her dead child, whom she can see standing within reach in front of her. The sight almost breaks her husband's heart. For a long time, the couple hoped that Nayeon would recover; the doctors had diagnosed a gene defect that was damaging the girl's organs, and it eventually led to her death. Yet right now their daughter seems more alive than ever. Jang watches as she walks towards a bed standing in a meadow, surrounded by the things Nayeon loved when she was alive: a glowing hare, an inflatable doughnut covered in multicoloured sprinkles. Nayeon says, 'Mum, we'll always be together, right? […] I will always remember you.' They'll always be together, or she'll always remember her? Nayeon doesn't seem to know exactly what things will be like for her and her mother, after this virtual encounter. Jang crouches by her daughter's bed, as she would have done many times when the girl was still alive, whenever Nayeon couldn't sleep or had a nightmare. 'Nayeon, Mum loves you so much. No matter where you are, I will come and find you, Nayeon. I still have things to do, but when I'm done I'll be with you,' she says. 'Then we'll be happy together.' 'I'm sleepy, Mum,' says Nayeon, and snuggles into the pillow. 'Stay with me, Mum. Goodbye, Mum.' A shiny white butterfly flutters up and alights on the child's body. 'I love you, Mum,' says Nayeon, as if half-asleep. 'I love you too,' Jang replies through her tears. One last time, she reaches out for her daughter – and again grasps at nothing. In that instant, a blinding white light spreads out, as if Jang's attempt to touch her daughter had extinguished the image. When the scene reappears, Nayeon has vanished. Only the white butterfly still flutters about, before it, too, vanishes – and with it also the light.

It took the Seoul-based Vive Studios eight months to distil the deceased seven-year-old's voice from the family's home videos and audio recordings, and to virtually reconstruct her face and body and infuse them with the digitalised movements of a living child. However, the sentences spoken in the park by the undead Nayeon were actually spoken by other children, whose voices were then mixed with Nayeon's. To capture the child's personality, the director had scoured terabytes' worth of smartphone videos and photos. Nayeon was born in 2010, three

years after the invention of the smartphone. She lived during a time when parents recorded every last detail about their children, especially in tech-obsessed South Korea. This lifelike simulation of a South Korean girl is only the first, uncanny proof of what can be done with this wealth of data. What started decades ago as mere sci-fi and cyberpunk fantasy will increasingly govern our lives in the coming years, and fundamentally change what it means to be human. We are witnessing the breaking of a taboo.

What happens when we take away humanity's last remaining certainty – our mortality? How do digital clones affect our conception of self? Do we dare interfere in the circle of life and death in order to make people (digitally) immortal? Who has the right to decide whether someone should be resurrected: the family? The companies who own the deceased's data? What will be the impact on society, when death can't silence even presidents who spend every minute of their lives tweeting? Who takes responsibility for the digital undead who will be haunting the web? What will be the consequence for progress, if our planet is continuously populated by past generations? And what will happen to memory itself, when nothing and no one is lost to us anymore? We have explored these questions, and found some surprising answers. Perhaps this is all just the beginning – the beginning of the end of our mortality.

Chapter 1: Simply Become Immortal?

The Eternal Me

In the beginning was the website. A plain, green website, with just a single question on it: *Who wants to live forever?* Underneath the question was a sign-up button for a 'beta version'. So all you needed to do was register, and you'd become immortal? What was this – a bad joke? We entered our details and waited to see what would happen next. Shortly after, we got a reply: *You are on the waiting list!* The company advertising immortality was called Eternime – as in 'eternal me'. There was no mention of fees, or of how soon we would receive our elixir of life (or whatever they'd be sending us). They were playing their cards pretty close to their chest. We sent a follow-up email asking for more information, but received no reply. By that point, the data we had to provide when we registered could have ended up who knows where. From the research we did for our last documentary, we already knew that tech companies are generally tight-lipped, mainly because they're afraid that their competitors will spy on them and steal their ideas: it's not just a question of being the first to come up with an idea, you also have to be the first to turn it into reality and put it on the market. That's why they avoid any contact with journalists, so as not to cause problems for the company by saying the wrong thing at the wrong time. During one of our most recent investigations, we occasionally found ourselves in the farcical situation of a company having warned their entire staff off speaking to us; photos of our team were promptly circulated, and some employees warned us of reprisals. So we were used to this kind of behaviour.

It looked like one of the reasons that Eternime was being so secretive about its magic potion for immortality was that it wanted to fuel people's imagination. However, we found a way around it: we continued looking into the company, and came across the Massachusetts Institute of Technology (MIT) in Boston, where the idea seems to have originated. MIT is one of the world's top universities, renowned for fostering innovation. *Simply become immortal*, it said on MIT's website – nothing could be easier. We gathered that it involved the use of data, of a person's digital footprint, but it wasn't clear how it would help attain immortality. After all, this wasn't the plot of a sci-fi series, but a real-life venture conducted at one of the world's foremost universities, where geniuses, the obsessed, and no doubt also a handful of lunatics, are busying themselves formulating visions for the next millennium. What happens at MIT is often

inconceivable and incomprehensible for anyone without a background in technology. MIT researchers have among other things programmed a fully automated 'Mars mobile' for NASA and made toasters, fridges and trainers 'smart'; and as far back as 1997, the MIT professors Nicholas Negroponte (b. 1943) and Neil Gershenfeld (b. 1959) laid the foundations for the so-called 'Internet of Things' we all use today. That this breeding ground would now also overcome mortality and create an 'eternal me' seemed ludicrous, despite the impressive list of innovations that have emerged from Boston. 'Simply become immortal' – the mix of understatement and hubris intrigued us. If we couldn't get in via the front door to speak to someone, we'd have to try the back. We found a Macedonian programmer and software developer online, who claimed to have worked for Eternime for a while. During a brief phone call, he tried to explain the technology: it was all about artificial neural networks modelled on the human brain, which were fed with massive amounts of data in order to reproduce human patterns. After someone's death, their avatar would be able to speak, think and act just like the deceased. It sounded a lot like that *Black Mirror* episode. The young man was excited about the project; but he didn't know much about where Eternime was currently at, because it had been some time since he'd worked for the company. But he promised to put us in touch with its CEO. He was true to his word, and a few weeks later we met the head of Eternime to discuss digital immortality, a concept that was still shrouded in mystery. Our journey started in a place we'd never had on our radar: Romania. Marius Ursache, the start-up's founder, invited us to meet him there, in the small northern town of Iaşi.

Before we started discussing his start-up Eternime, we asked him why we were meeting in Iaşi instead of Boston. For the initiated, Romania has long been a cradle for tech start-ups; Marius grew up here, the living costs are far lower than in the world's better-known tech hotspots, and there is no shortage of qualified software developers. Still, if Marius had had his way, we would have met in the US rather than in Romania. After doing a degree in medicine and an MA in theatre studies(!), he boldly changed direction, founded first a design and software agency and then a fintech start-up, and was finally accepted into the sought-after Entrepreneurship Development Program at MIT. When the prestigious university put out a call for innovative business concepts, he was crazy enough to submit the most bizarre idea he could think of: 'It may sound strange, but it all started with the thought of what would happen if we could Skype with the dead? What if we could live for ever? What if we could store our memories in an avatar who looks like us, talks like us and remembers what we remember? What if this avatar could interact with other people?' To his surprise, Marius says, many of his professors and fellow students at MIT were gripped by the idea, and it didn't take long before he was

surrounded by a team of people who didn't want to miss the opportunity of being part of a revolutionary new tech venture. Cracks from every discipline went to work. It was the perfect breeding ground, and almost immediately several demo programs emerged. The team soon developed the concept's first beta version, and then created a website with the simple question: *Who wants to live for ever?* Anyone interested could register, and according to Marius several hundred people did so within just a few hours, rising to tens of thousands a few days later. 'During the first days, 40,000 people registered with us, among them people who didn't have long to live, people dying from cancer. We were completely overwhelmed.' They received numerous heart-breaking requests for more information from the terminally ill, and he says that he realised only when it was too late that those people saw his project, his 'crazy idea', as their last hope. Their enquiries placed him in a dilemma: true, the way in which the website had resonated so extraordinarily with people was every entrepreneur's dream – and the fact that his idea had evidently hit a nerve inspired him to work in all seriousness on turning it into a reality; but the hopes of terminally ill people also weighed heavily on him. So far, Marius had nothing concrete to show them, and in the sober light of day, the enormous cost of developing artificial neural networks capable of learning and extracting the behavioural patterns of the deceased from a vast set of data made his endeavour look like sheer arrogance. He had deprived these terminally ill applicants of the possibility of finding closure, and instead merely agitated and confused them. As Marius talks about those days, he grows thoughtful and quiet. Averting his eyes, he recalls those messages he'll never forget: 'Some people wrote that they only had a few weeks to live. They wanted to access Eternime as quickly as possible. They wanted to use what little time they had left to preserve memories for their loved ones. It was impossible for me to reply to them. I just couldn't do it. What could I have said? That it was all just a crazy MIT experiment? That we had no idea how to capture any of it?' Today, he says, he'd do things differently – he'd act more responsibly, more considerately. But the speed with which the venture took off meant that there was no time for reflection. The media jumped on the bandwagon: 'All the big tech magazines, like *Fast Company* and *Wired*, picked up the story.[13] It was surreal.' As always happens, the high was followed by a comedown: because of the media circus and the number of enquiries with which they were soon inundated, their work itself fell by the wayside. The team's mood darkened. The money ran out and his colleagues jumped ship, one after the other, until he was the only one left – without resources, without investors, without a future for his idea. As quickly as he'd entered it, he left MIT and the brave new world of

[13] See https://www.fastcompany.com/3025797/eternime-wants-to-let-you-skype-your-family-from-the-grave and https://www.wired.co.uk/article/eterni-life-after-death-ai.

successful start-up entrepreneurs he had conquered only a short time ago. He returned to Romania. It would take six months for him to recover from the crash landing. Marius felt like a failure: to be just shy of forty years old and living with his parents again, who on top of that were giving him pocket money, was intolerable for a man who until recently thought he was reaching for the stars. He also felt guilty about the people who, for all he knew, were still waiting for immortality. Why didn't he take down the website, then? He says he couldn't stop believing in the possibility that his idea might still succeed.

His best friend Roca believed in him. He encouraged Marius to keep pursuing his idea, and they came up with a business plan. They sat together for nights on end coming up with potential investors. Like Marius, Roca believed that good tech can change the world. Marius quickly regained his enthusiasm. He tried to put his small start-up on a more solid footing, and sought out new contacts at tech universities in the US – which tend to forgive you your mistakes, because there are too many stories of pioneers whose trailblazing business ideas only took off at the fourth or fifth attempt.

Marius was ready to go for it again, but shortly before he could put his plan of moving to San Francisco into action, he received a call that turned his life upside down: 'A friend rang me to say that Roca had been in a car accident.' He'd died at the scene.

His friend's death made Marius believe more fervently than ever in his idea. 'Before the accident it was just a crazy experiment, an interesting, technically challenging project, but now it's my life's mission.'

Marius stayed on in Romania after Roca's death. And digital immortality? 'We're back on track,' Marius says. In the meantime, there's an app that automatically collects information about its users, everything from Facebook posts and calendar entries to their movements, all sorts of data from fitness trackers and other wearables, photos, videos, and so on. As yet, the app is only accessible to a small group of testers. But any doubts as to the justification for the Eternime project seems to have been dispelled. 'I realised that we don't know how we're supposed to deal with death. We try to run away from it. We try to forget, because we think that it'll heal our trauma. But I think that remembrance is key. We can exert a positive influence on our memory. There's a neuroscientist called David Eagleman, who said: "There are three deaths. The first is when the body ceases to function. The second is when the body is consigned to the grave. The third is that moment, sometime in the future, when your name is spoken for the last time."[14] We can't really do anything about the first two deaths, but I think that thanks to technological advances we can prevent the third.' Marius isn't giving up, although he's still finding it difficult to

[14] David Eagleman, *Sum: Forty Tales from the Afterlives* (Edinburgh: Canongate, 2009).

bring in enough start-up capital. 'Sadly, death is taboo. Many big investors are scared of putting money into an idea like this, because nobody talks openly about death,' he tells us. But it won't prevent him from continuing to tilt at windmills.

We take our leave. We're impressed by what Marius has built here in Romania, impressed by how he has managed to gather strength from the tragic loss of his best friend and convert grief into something life-affirming. Eternime ceased to be a pure business idea long ago. It's neither about omnipotence, nor about boycotting death; rather, Marius is searching for a way for us to interact candidly and thoughtfully with death. In a way, Roca has become immortal: once a year, his friends come together to tell each other stories about him and sing his favourite songs. Can a smartphone app replace the collective mourning of those left behind? Can it broaden and augment our ability to overcome grief? Aren't phone conversations with the dead and on-screen remembrance rather solitary affairs? For now, there's too little to distinguish the good from the bad for us to judge whether Marius's technology will turn out be the hero or the villain of the piece.

To answer these questions, we need to meet those who are further along the road than Marius, people all over the world who have either already created digital clones, or decided on a different approach.