Part IV
Memory and the Future

Introduction to Part IV

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Between memory, imagination and the future: prospective memory processing

Part IV explores the role of memory and the imagination in future thinking. With the shift away from classical thinking about memory as the retrieval of fixed information about the past towards a modern conception of memory as a process of constant re-ordering and re-interpretation of information, we are also forced to ask new questions about the temporality of memory. The past infuses and is inseparable from the present moment, so that the present is profoundly shaped by memory, whilst our relationship to the past is constantly reconditioned by present contextual associations. But what about the relationship between memory and the future? We have already seen in Part III how climate change is posing increasingly complex questions about the relation between our past, present and future. Part IV explores this intricacy further via a group of highly theoretical thinkers which includes a narratologist, an evolutionary biologist who specialises in AI, a technology futures analyst, a Professor of Film Theory, a science fiction writer and an experimental philosopher.

This part starts from the counterintuitive assumption that memory is not just for looking backward, but that it is also a tool we need in order to plan for, and make predictions about, the future. Memory is not just about the past (retrospective memory), but is also geared towards the future (prospective memory). Our ability to reconstruct the past through memory has a direct relation to our capacity to construct a hypothetical future. Memory enables us to plan ahead. In order to make choices (like, say, whether the hunt for an animal is likely to result in food for the tribe, or whether a traffic jam on our way to work yesterday will makes us change our route today), we need memory as a database that allows us to predict outcomes accurately and successfully in the imagination. Memory is thus heavily reliant on a characteristic that sets humans apart from animals, namely, imagination, which we use to project a present situation, question or decision-making process into an imagined future based on knowledge accrued in the past. Chimpanzees and some birds have this capacity, yet humans manage to grasp an astounding number of concepts simultaneously, and therefore have more 'short

cuts' for cognition. This capacity develops around the age of five, when we acquire language, and it is the complexity and detail of our ability to plot and plan that make us unique.

Since 2007, neuroscientific experiments have provided a different angle on the relationship between memory, imagination and the future. It turns out that many of the same mechanisms and regions of the brain involved in remembering are also ones used to imagine the future. These mechanisms have been named 'the default network' (Szpunar et al. 2007) and are the subject of much research and theoretical speculation. Neuropsychologist Daniel L. Schacter is one of the key researchers who has developed a theory of prospective memory processing, focussing on the frontal lobes of the brain which regulate memory for future actions. This does not mean that the human mind is able to predict the future, as in Steven Spielberg's adaptation of a Philip K. Dick story in *Minority Report* (2002), where so-called psychic 'pre-cogs' have foreknowledge of crimes. Whereas retroactive memory relies on subjects being prompted to remember, prospective memory involves self-initiated retrieval processes to carry out future intentions – people have to remember to remember executing certain actions (Glisky 1996). Research has shown that, when we remember something with the future in mind, our retention is boosted – which chimes in with the research into survival narratives and memory discussed in Part III. Here is an example from research into prospective memory: Klein and his team asked separate groups of participants to think of one out of three camping stories. The first involved imagining a future camping trip, the second remembering a past camping trip, and the third involved imagining a typical campsite without reference to the past or future. During the retrieval exercise, participants needed to indicate how various likely items (such as rope and a tent) were part of their self-invented stories. After some time, the candidates were asked to retrieve from memory the list of items associated with their story. It turns out that participants with a simulated memory of a future camping trip remembered more items than the other participants. Simulated experiences are remembered extra well (Szpunar et al. 2013), and different simulated versions of the future can benefit behaviour and help make decisions, such as what strategy to use when we encounter a conflict at work.

Schacter has also not only been discovering that there are striking similarities between remembering and simulating the future, but that both are important for using one's imagination and for situating oneself in time. Amnesiacs with hippocampal damage, for instance, revealed significant impairments when they were asked to imagine novel experiences (Hassabis et al. 2007). Patients with Parkinson's disease exhibit failures when asked to imagine future scenarios, but they perform well when asked to imagine atemporal events (like interacting with people, but without any movement in time). These patients suffer from failing chronostesia, which is the ability to be aware of subjective time. Another fascinating find is that recent positive experiences are 'associated with increased subjective ratings of re-experiencing for past events and "pre-experiencing" for future events'.[1] And this has impact on one's identity: '"self-defining memories" – past events of great importance that shape and individual's sense of identity – are

manifested similarly in the construction of self-defining future projections, i.e. imagined future events with great importance for self and identity'.[2] This phenomenon will be explored in greater detail in Part VI. The consensus amongst these investigations of the future of memory is that 'a key function of memory is to provide a basis for predicting the future via imagined scenarios and that the ability to flexibly recombine elements of past experience into simulations of novel future events is therefore an adaptive process'.[3]

Other perspectives on the relationship between memory and the future have seen a similar shift in point of view since the postwar period. On a collective, societal level, we used to think that our society's future was simply a linear extension of the past. Enlightenment thinking was based on Progress, which assumed that the world would continue much as it used to in the past. After the Industrial Revolution, we thought we could even make our future lives better; we could establish Progress, and much of the effort to create progress depended on taking away risk. During the twenty-first century, however, many of the linear, causal models of this type of thinking were undermined and made way for new theories that focused on the many uncertainties and instabilities at the heart of the universe. Einstein and Heisenberg feature centrally in our complexification of conceptions of time, which have undergone remarkable changes. Similarly, with modernist writers such as T. S. Eliot, Virginia Woolf and Samuel Beckett, and the postmodernist writers who followed in the later twentieth century, we have been given stories that have subverted conventional notions of causation, linear time and Enlightenment ideologies.

Indeed, all these thinkers railed against a rationalism that had its origins in thinking underpinning the classical civilisation of the Greeks, and the idea of causality based on the idea of the unilinear chain, which was the basis for understanding the physical world, as well as establishing a social contract. Just as a stable climate was required, risk and instability were required to create a stable society and to control the future. But as our recent history has become a succession of calamities, freak accidents and strokes of luck, we should acknowledge the fundamental unpredictability of our modern world. Contemporary technology allows us to reduce the risk and better the outcomes from chance events like earthquakes, hurricanes and terrible diseases like smallpox in a way our ancestors would long for. Yet, the same technology allows new infectious diseases, political and religious extremism, and financial disasters to make their way around our planet in swift and unpredictable ways.

Shrinking horizons, disappearing futures

One key book that explores such instability is Nassim Nicholas Taleb's *The Black Swan* (2007), which shows that the financial world has grown into a very instable system. A seemingly minor event on one end of the world can trigger huge consequences on the other end, such as bringing down the economy of a small country. Our ever-increasing and empowered human population means that more and more highly improbable events will actually take place, due to the

sheer number of events we all trigger. Taleb sees his Black Swan theory justified by recent events, from the 9/11 attacks to the 2004 Indian Ocean tsunami, and from the 2007 economic crisis to volatile weather. We seem to find ourselves in an increasingly unstable world, with climate change, globalisation, and a volatile economy. In such a context, then, memory and history are less useful, as the store of knowledge we have at our disposal cannot be used to predict the future anyway.

There is also the fascinating notion of the 'technological singularity', which inventor and futurist Ray Kurzweil describes as

> a future period during which the pace of technological change will be so rapid, its impact so deep, that human life will be irreversible transformed. Although neither utopian nor dystopian, this epoch will transform the concepts that we rely on to give meaning to our lives, from business models to the cycle of human life, including death itself.[4]

In a way, Kurzweil's 'prediction' is a reality we have lived with since at least the period when the advent of writing allowed the acceleration and aggregation of our sociotechnical culture, 10,000 years ago. But now our horizon is shrinking and the future is disappearing exponentially faster, and the nature of our technological revolutions makes it impossible to predict the form and content of lives in even the next 20 years. Although *Back to the Future Part II* (Dir. Robert Zemeckis) predicted some technologies correctly, in 1989 we would hardly have believed that 26 years later we'd all walk around with a pocket-sized computer that allows us to ring others, navigate cities, measure our blood pressure, tell the weather and give us any information we desire. It is increasingly difficult to look over the horizon of our current knowledge, and our ability to predict the future is diminished. Thus, one might argue that the roles of memory and history also have a less important role in our contemporary culture: our knowledge and the databases of the past (both at the level of the individual as well as socially at a global level) are less useful because linear, causal projections have made way for exponential models. If we accept that our comfortable tendency to focus on the known detracts from the fact that it is the unknown that deserves our attention, this makes our world deeply fragile and our lives profoundly precarious.

Memory and futurity

Part IV explores these new uncertainties and foregrounds the futurity of memory. Futurity is defined as 'the time ahead of us, the future times that we can sense coming [. . .] Futurity constitutes the *present space* of the future, which can be seen *today* as the future'.[5] The problem is, then, that it is the present situation, shaped by the past and our memories, that determines our sense of the time ahead of us. The future is always the present future, which is dominated by specific narratives and ideologies. This is what Jessica Bland brings to the fore in her chapter: apocalyptic predictions blind us to alternative future possibilities, and she suggests that we revisit and rethink our episodic memory of the past so that we can re-vision

the future. Fiction has a great role to play, here, because it is able to imagine alternative worlds which are not ruled by the dominant ideologies of 'the real world', as Adam Roberts stresses.

We explore how our relationship to the future has become more conditional and contingent. We're fully aware now, in the digital age, that our living present will be a memory in the future. Whenever I upload a picture onto Facebook, the moment I hit the 'post button', that image is already an archived memory, moving just as fast into the past as it drops away towards the bottom of my computer screen, increasingly displaced by newer news. However, simultaneously, we understand that this memory should also be approached as the residue of our lives we can reread in the future. When returning to the archive of our posts, we can bring that apparently fixed memory back, and reread, recontextualise and reinterpret it, or repost it in a new context. New technologies allow us to alter, update and recontextualise our memories of the past in the future, which makes our engagement with these images open and flexible, but perhaps also more relative and provisional. In many ways the digital experience matches ever more closely how memory works in our head.

In Chapter 22, Mark Currie reinforces that the futurity of memory is a complex, counter-intuitive concept that brings out tensions in our thinking. He investigates how memory, especially in narrative fiction, can escape clear-cut temporal categories by arguing that memory can function, or be experienced, as a kind of curious hybrid of past, present and future. Currie gives us a philosophical meditation on the 'impossible' idea that future events have already taken place by investigating how stories (especially in printed form) embody that idea. Memory is usually thought of as retrospective, yet Currie shows how the novel introduces an intellectual complexity to conventional unilinear causal conceptions: '[T]he unfolding temporal sequence of the story is a simulation produced by a semiotic sequence that is already complete in advance. We find in narrative in general, exactly the comingling of futurity and completion, virtuality and actuality and contingency and necessity'. The point is that a story forms a kind of imaginary space, radically different from our experience in/of real life: in the novel there exists an 'objective existence of the future in the sequence of words that simulates time flow in fiction, and it provides the reader with a temporal perspective that cannot exist in life, where the future is virtual and inaccessible as a matter of definition'.

Joanna Bryson (Chapter 23) picks up on Currie's points about memory as an integral part of a simulation of the future and notes that our knowledge of our past, from an evolutionary point of view, is not so much about the past, but a tool that lets us make decisions that will allow us to survive; memory serves as the basis for prediction or planning the future. Bryson goes on to points out that our mind's welding together of the past, present and the future has a social function, as it provides the imaginary framework for a stable civilisation:

> The fact it is so hard to remember narrative, the fact we do it so badly, almost certainly means that narrative is not what memory was originally evolved to record. It has all the marks of a retrofitted kludge we have invented, a capacity

> to reconstruct a past. Constructing a past may not seem or even be as useful as choosing a future, but it does have a role. [. . .] Arguably, the entire related concept to narrative of identity has similarly been invented to allow societies to self-regulate.

By availing ourselves of the many different levels at which memory operates, memory provides individuals and communities with a conceptual framework for thinking about how morality and social constraints are inscribed into the body politic, for example remembering laws and moral boundaries, one's duty to one's fellow citizens and country. Memory is thus a profoundly ethical instrument.

In Chapter 24, technology futures analyst Jessica Bland offers an insight into how technology impacts on the prospects and world view of today's new generations. Growing up during the economic crisis, in a world of climate change and full of freak accidents, she notes that for her generation born in the mid-eighties 'the burden of this rolling crisis sits on our shoulders: what are we going to do to disrupt the path towards pervasive instability?' The end-time thinking prevalent in public discourse makes Bland feel as if she's a character in a novel, whose gloomy future already exists. The sense of 'authorship in the grand narrative of my life has been removed', she notes. To regain a sense of agency, Bland explores three ways to think about, or 'through', the future – forecasting, foresight and fiction. She wants to create tools that allow her generation to reimagine the future outside the grand global catastrophe narrative and to contribute to a viable and valuable future. That will require two things: first, creativity and creative, playful spaces, and second, the altering of our memory: only through a modification of the memory and a re-imagination of play – by prising open our singular perception of the past – can we create dynamic, plural and protean futures for the generations to come. 'In a world where the future feels like it is already written, could we harness the power of episodic memory to help us take charge of the future?' asks Bland, who gives us a tentative model of how such a process would work.

Patricia Pisters (Chapter 25) follows up on these contributions that connect the past, present and future by showing that our conceptualisation of the future is based on the expectation of a cyclic return of the past. By referring to examples from modern and contemporary cinema, Pisters argues that now we are experiencing a shifting temporality of memory. Looking at our present culture from a collective, data-based level, she argues that 'we increasingly conceive memory from the point of view of possible futures'. This is partly to do with the emergence of Big Data and algorithmic patterning: the database logic demands an 'endless series of new combinations, orderings, and remixes of its basic source materials, which on a temporal scale matches the characteristics of the third synthesis of time, the serialisation and remixing of the past and the present from a point of view of the future'. Whereas the usual rootedness of our perception in the past leads to the acceptance of one possibility of reality, we now see a universal ungrounding of perception and temporality that emphasises a plurality of future possibilities: 'memory no longer functions as a stable ground or source that allows

us to extrapolate or extend a logical future', which is one of the ideas that unites this part.

SF novelist Adam Roberts (Chapter 26) continues the exploration of the non-causal, anti-rationalist thinking about memory in a sprawling chapter that he starts off by thinking, like Joanna Bryson, about the role of memory in evolution, and the role of evolution in memory. In our present, Roberts shows that new research challenges 'the traditional view of memory formation as a direct flow from short-term to long-term storage' and that we now know that many 'different components of memory emerge at different times after the event to be memorized has taken place'. This is partly to do with the creation of prosthetic minds by external storage systems, which draws Roberts into the Extended Mind Theory of Clark and Chalmers. Like Currie, Bland and Pisters, Roberts explores 'the literature of future possibility', such as Borges's 'Funes the Memorious' and Philip K. Dick's 'We Can Remember It For You Wholesale', but he also invokes work by G. K. Chesterton and Milan Kundera. This leads Roberts to explore the idea that at the moment technology allows us to aspire to some kind of all-knowingness, a total recall which poses new questions about cognition. For Roberts, a complete memory would probably render life unliveable, yet this imagined perfect memory would enable us 'to recall not just the things that had happened to us, but the things that happened to everyone and everything with which we came into contact'. Simultaneously, we'd need to reconsider the classical 'division between "real" memory, the memory of artifice (films we have seen, books we have read) and actual artificial memory itself'. This is one of the cognitive revolutions we are living through at the moment.

Part IV finishes with a chapter by philosopher Dan Hutto, who puts forward provocative ideas about enactivism, an embodied form of cognition that suggests that there can be basic forms of human mind without content. Hutto starts with an exploration of ideas found in classical philosophy, which represented memory as the retrieval of fixed content from memory palaces. Memories identified with mental items in individual minds and acts of remembering are, at their core, conceived of as inner mental processes occurring within individual minds; the *content* of memory was seen as objects captured, for instance, in specific images – essentially a non-narrative way of thinking about memory. Hutto introduces narrative as a way of undermining that established way of thinking about memory: stories are used to link different bits of information and make them coherent, yet there is, as we all know, a high level of manipulation taking place. Another implication is that the storification of bits of information should move our analysis away from the *content* of memory to how memories are produced as a *process*; also from memory as an embodied process taking place within individuals to a more collective, shared narrative. Hutto then proceeds to make a case for a new way of viewing memory, with an emphasis less on content than on the importance of narratology in culture, with which we come full circle back to Mark Currie's chapter. Memory should be seen, according to Hutto, as a 'discursive achievement, the mastery of narrative skills'.

Ultimately, the chapters in Part IV address a key paradox of late modernity, in which two opposite narratives present opposite ideas. On the one hand, we see a strong presence of apocalyptic thinking that makes it seem and *feel* as if the destiny of ourselves and the fate of the world is already written. On the other hand, there is a new emphasis on the unpredictable nature of our world, which promises more instability and perpetual change. The contributors argue that we should harness our imagination to find new creative spaces of play to cultivate a multiplicity of possible, alternative futures. This partly depends on acknowledging our changing understanding of, and attitude towards, memory. If memory operates and acts the same as predictive simulation, we should use the dynamism and mutability of memory so that we can reorder and reinterpret the past with a view to force a reconsideration of the world to come. If we want it to be, the future is wide open.