What may be of more interest to readers of this journal is the tension we find in the thinking of these scholars between memory and writing. Again, this has a long history, going back to Plato, who places in the mouth of Socrates an Egyptian story of the invention of writing. When presented with this innovation, the Egyptian king laments that it "will create forgetfulness in the learners' souls because they will not use their own memories," but "will trust to the external written characters" (*Phaedrus* 275a–b). *Chi scrive non ha memoria* (Who writes, has no memory), wrote Giovanni Torriano in 1666, reporting an Italian proverb (p. 37). The *virtuosi*, however, claimed that writing could assist rather than replace memory, acting as an aid to recollection. More importantly, written notes could be an aid to thought, particularly when combined with new forms of technology, such as the *arca studiorum*. Boyle, for instance, argued that keeping information on loose sheets that could be shuffled around "could help to generate hypotheses" (p. 173). Once again, this idea anticipates more recent discussions of what has come to be known as "extended cognition." Thinking does not occur merely "in the head": it occurs by manipulating symbols and by means of external tools.

Set in a slightly broader historical context, these are some of the key observations to emerge from Yeo's meticulously researched book. Those who wish to better understand the world of early modern thought will find much to reflect on in these pages. A modern philosopher, however, may be a little disappointed not to find any one big idea emerging from this work. Yeo's volume is not "one long argument" in support of a grand thesis, but an accumulation of observations loosely gathered around a central theme. One can, however, only marvel at the scholarship of its author and (like the early modern repositories of which it speaks) it will surely serve as a treasure-trove of material to be mined by later scholars.

Kourken Michaelian
Mental Time Travel: Episodic Memory and Our Knowledge of the Personal Past. Cambridge, MA: MIT Press, 2016. 312pp. $43.00.

Reviewed by: Steven James, *West Chester University of Pennsylvania, USA*

What is it to remember past episodes in your life? In *Mental Time Travel*, Kourken Michaelian aspires to tell us by offering an account of the metaphysics and epistemology of episodic memory that is not merely consistent with and informed by contemporary empirical research, but actually *based* on it (p. xv). To that end, the work is largely successful and stands as an excellent contribution to intersectional research in philosophy and psychology.

The work is advanced and will be best appreciated by those familiar with psychological and philosophical methodologies. It is also very clear and accessibly written. Those who enjoyed Sven Bernecker's *Memory: A Philosophical Study* (2010) but found its discussion of empirical work a bit thin should find Michaelian's effort to be more satisfying although to some degree at the expense of philosophical depth.

The book is divided into four parts. The first specifies the scope of the book and lays out background assumptions and decisions. The overall goal is not to provide a fully developed *theory* of episodic remembering in the philosophical sense, but rather to provide a framework for thinking about human memory that will be useful for both philosophers and psychologists. The central idea is that there is no difference *in kind* between remembering the past and imagining it. Yet, this does nothing to diminish memory's import for epistemology. If anything, it underscores memory's role as a genuine *source* of knowledge.

Chapter 2 is a highlight of the first part of the work as Michaelian argues persuasively that human memory is not plausibly a natural kind—its properties are simply too varied. He also offers

a reasonable reorganization of a familiar taxonomy of memory systems. In place of the division between declarative and non-declarative memory, Michaelian makes the central division one between cognitive and non-cognitive systems. One significant result is that priming effects are grouped with episodic and semantic memory instead of with procedural memory, conditioning, and other forms of non-associative learning. The chapter also draws attention to an underappreciated issue concerning the relationship between episodic memory and autobiographical memory. At the very least, these categories come apart because there can be non-episodic autobiographical memories. Given that the constructive nature of memory processing partially motivates abandoning a causal theory of remembering in the second part of the book, it is somewhat surprising that Michaelian does not explore the inverse possibility—that there may be non-autobiographical episodic memories. Nevertheless, the result is thought-provoking and welcome.

Chapter 3 describes the version of philosophical naturalism that drives the project (Michaelian models his naturalism closely on Hilary Kornblith's (1995, 2003)). In the spirit of methodological naturalism, he also adopts a pluralist perspective on the epistemic properties of interest for the philosopher of memory. While the reliability of memory processing is central to the project, the framework developed in subsequent chapters also engages with properties such as speed and power of processing as well. One notable omission from the later proposal is the notion of *truth*. Michaelian's justification for abandoning truth as essential to episodic memory is that, like perceptual representations, episodic memory representations have a "sensory" rather than propositional content. As such, they merit a graded notion of accuracy instead of the binary notion of truth/falsity (pp. 52–54). Given the ready availability of propositionalist accounts of perceptual content in the perception literature, this appears to be premature and might complicate matters needlessly. However, one need not follow Michaelian here to appreciate the value of the rest of the framework.

The second part of the book motivates and develops Michaelian's "Simulation Theory of Episodic Remembering." Chapter 4 briefly canvasses some folk psychological and historical ideas about what remembering involves. The central moral is that while common sense would tell us that remembering is roughly a matter of reproducing earlier knowledge and experiences, the re-creative character of memory processing requires us to give up much of our intuitive understanding of remembering.

Specifically, common sense suggests that in order to remember something, one's present memory experience must at least (a) be appropriately connected to one's prior experience(s), (b) have a content that is sufficiently similar to the content of one's prior experience(s), and (c) be factive (i.e. one cannot remember what did not happen). Michaelian will ultimately argue that the constructive nature of memory processing requires us to give up all three of these common sense ideas.

Chapter 5 examines an influential framework for making the common sense conception of remembering precise—the Causal Theory of Memory (as proposed by Martin and Deutscher (1966) and later updated by Bernecker (2008, 2010) and Michaelian (2011) himself). He offers a range of interesting cases, some from the literature, some of his own, and provides brief reviews of the empirical work on memory traces, encoding, consolidation and reconsolidation, and retrieval.

The discussion yields a "Causal Theory of *Constructive* Memory" according to which a subject remembers an episode if and only if seven conditions are met: (a) they experienced the episode, (b) they now have a representation of it, (c) they previously had a representation of it, (d) that previous representation was appropriately connected to the episode (by, for example, perception), (e) the content of their present representation does not go too far beyond the content of their prior representation, (f) there is a causal connection between the present and prior representations that goes by way of continuously existing distributed memory traces, and (g) the causal connection is supported by a properly functioning (i.e. reliable) memory system.

This updated causal theory manages to maintain much of our common sense conception, but also has some surprising implications for the epistemology of memory. Among them, contrary to common sense, memory is capable of providing us with fundamentally new knowledge, and so must be grouped with other primary epistemic sources, such as perception.

Some would view this as revisionary, but according to Michaelian, it does not go far enough. If we are really to respect the picture emerging from empirical research on "mental time travel," we must give up conditions (a–f) and adjust (g) accordingly. Among psychologists, the consensus is that the episodic memory system is a general episode construction system designed to draw on information originating in past experiences to simulate possible episodes. Consequently, while simulation of a past episode often draws on information originating in the subject's experience of that episode, it will rarely draw exclusively from that experience and, in principle, need not draw from that experience at all (p. 103).

This observation leads Michaelian to a "view of remembering as simulating or imagining episodes from the personal past" (p. 97). More precisely,

S remembers an episode *e* if and only if

1. *S* now has a representation *R* of *e*.
2. *R* is produced by a properly functioning episodic construction system, which aims to produce a representation of an episode belonging to *S'* personal past. (p. 107)

The proposal is certainly provocative; there is no deep difference between remembering and imagining. Remembering is simply that species of imagination that is produced by a reliable construction system that aims at one's personal past.

It also naturally gives rise to a variety of questions; unfortunately, many only receive a cursory treatment. I will mention a few. First, when does a representation *R* count as being a representation of a particular event *e*? While the causal theory has intuitive resources available to answer this question, the simulation theory will not make use of accuracy for one can remember inaccurately. Nor does it give any particular source of information (e.g. prior experience) special privilege. It does require that "sufficient information" be available (p. 112), but the reader is left with plenty of room to speculate about what that means.

Relatedly, what does it take for a construction system to aim at producing a representation of a particular episode belonging to the subject's personal past? The initial suggestion is that it is a matter of the system's "intention," which is shorthand for the system's response to retrieval cues (pp. 112–113). But little is said about the relationship between cues and particular episodes.

Finally, what is the relationship between simulation and imagination? At times, it seems as though Michaelian treats these notions interchangeably, or at least takes the fact that a process is simulational to be sufficient for its output to be an instance of imagining (p. 97). It is not immediately clear why this should be the case; a computer might simulate the movement of traffic without imagining anything at all. So, one might wonder whether the consensus appealed to as support for the provocative claim that remembering is a species of imagination better supports a more modest claim: the *processes* that support remembering and the *processes* that support imagining are not of distinct natural kinds. Since the same neural mechanisms may implement multiple functions (Anderson, 2010: 175), this opens the door to the possibility that remembering and imagining (qua *results* of processes) may not be as similar as the simulation theory suggests.

If there is a weakness in the project, it is here and, in particular, in the often short treatment of objections. For example, Michaelian notes that Debus (2014) argues for a difference in kind between remembering the past and imagining the future in virtue of the fact that the former has a particularity that the latter cannot have (a structurally similar distinction could be drawn in terms

of factivity). Michaelian accepts that such considerations *could* be part of a theory, but (following Hopkins, 2014: 70) maintains that since they pertain to differences that do "not correspond to a psychologically real difference" (p. 117), there is no room for them in a *naturalistic* project.

The problem with this brief response is that it eschews crucial issues for the project. The question of what it is to *remember something* has multiple dimensions. Part of the answer must be given in terms of (a) the rememberer. For naturalistic theories, part of the answer must also be given in terms of (b) the cognitive systems, mechanisms, and processes that underlie the remembering, as they are revealed by empirical investigation. These are where "real psychological differences," as Michaelian conceives of them, can be found. However, this is not the whole story. Specifically, it leaves out (c) *what is remembered* (in this case, past episodes), and (d) the relationships between what is remembered, the memory processes, and the rememberer. Without also speaking to (c) and (d), a theory seems to be less a theory of the metaphysics and epistemology of *remembering* and more a theory of the metaphysics and epistemology of the processes that are *partially* constitutive of remembering (or at least support/enable it in humans).

In the third part of the book, Michaelian undertakes the task of developing an account of the mechanisms responsible for ensuring the reliability of simulational remembering (p. 123). The goal is not to engage in the futile project of trying to argue *that* memory is reliable, but rather to show *how* human memory could be adequately reliable, given its constructive, simulational nature. The discussion, though at times brief, is illuminating and compelling, and should be a model for interdisciplinary scholarship.

Chapter 7 shows that, contrary to what our intuitions might suggest, the extensive incorporation of testimonial information into memory representations is not only compatible with memory reliability, but may actually increase its reliability and power. He reviews empirical work on the misinformation effect, and argues convincingly that it should be seen as an instance of a more general "information effect" which need not have negative epistemological consequences.

Chapter 8 explains how subjects can solve the "source problem"—that is, the problem of determining whether the content of a memory representation comes from a reliable source of information. In short, metacognitive processes use heuristic information about the properties of a retrieved representation as a means to attribute the information to reliable or unreliable sources.

Chapter 9 explains how subjects solve the "process problem"—that is, the problem of determining whether one is remembering or engaging in some other kind of episodic construction. Again, the solution is metacognitive; Michaelian expands resources of the source-monitoring framework to show how cognitive systems use a combination of monitoring criteria to develop distinct feelings of remembering, imagining, and so forth.

The final part of the book addresses a more psychologically focused question: why did episodic memory evolve? Chapter 10 reviews competing conceptions of episodic memory: phenomenological definitions emphasize the subjective dimension of episodic memory—the mode of presentation of past episodes. Contextual definitions emphasize the stored information (where, what, and when). Michaelian favors the phenomenological approach and takes the central task to be to explain why the subjective aspect of episodic memory evolved.

In chapter 11, he reviews available explanations of the evolution of episodic memory and finds them all inadequate—particularly with respect to explaining the subjective dimension of episodic memory. Michaelian's alternative explanation is that the subjective dimension evolved because it serves a metacognitive function—it enables the subject to reduce uncertainty about whether they are remembering or imagining, and so ultimately to reduce uncertainty about the accuracy of a memory representation.

There is much to like about Michaelian's effort here. For philosophers (or others) seeking a concise and effective summary of recent empirical research on memory, it is invaluable. For

psychologists (or others) seeking a display of how empirical work on memory might be embedded in a more abstract theoretical framework, it is a welcome addition. And for anyone interested in the relationships between memory, imagination, and knowledge, it is an enjoyable, illuminating, and thought-provoking read.

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Bruno Davide

The Preservation of Memory. New York: Routledge, 2016. 232 pp. £95.00.

Reviewed by: Michael Hornberger, *University of East Anglia, UK*

Overall, I thoroughly enjoyed reading *The Preservation of Memory*. The book takes on the daunting task of bridging memory research findings ranging from the cellular level through to real-life applications, and it carries this task out with aplomb. The breadth of the research covered by the volume is impressive, and it is therefore astonishing that the authors and editor manage to keep its length under 250 pages. The concise nature of the book will make it an ideal means for students, post-docs, and health care professionals alike to familiarize themselves with the main themes of memory research and its implication for treatment. Had a book such as this been available during my student days, it would have triggered many different research ideas, so my hope is that future generations of researchers and health care professionals will read it and make use of the knowledge thus acquired in their research and clinical care.

The book approaches the subject of "the preservation of memory" is neatly divided into four parts. Part I provides the reader with a short review of current memory concepts and the basic anatomy of the relevant brains structures involved in memory processes.

Chapter 1, by Rutherford and Bruno, sets the tone for the book by briefly outlining memory concepts and models, as well as their implications for aging and dementia. The authors begin with a basic history of memory research, before reviewing models of short- and long-term memory. The discussion of short-term memory models is mostly focused on classic models, such as that of Atkinson and Shifrin and that of Baddeley and Cowan; the relevant aging studies are also discussed. This is followed by a review of long-term memory models, which is, however, given much less space, as later chapters in the book discuss them in more detail. This brief introduction of the taxonomy of memory prepares the reader for the second chapter, which introduces the neuroanatomy of memory processing, with a particular focus on the hippocampus.