Amy Kind (ed.), The Routledge Handbook of Philosophy of Imagination*, London: Routledge, 2016, 482 pp.*

The book is extremely rich. Given that it contains thirty papers, I shall be able to say something only about a part of it. For instance, I shall here for the reasons of space have to skip the rich and interesting Part I, dedicated to historical treatments of imagination, featuring papers on Aristotle (by Deborah K.W. Modrak), Descartes (by Dennis L. Sepper), Hume (by Fabian Dorsch), Kant (by Samantha Matherne), Husserl (by Julia Jansen) and Sartre (by Robert Hopkins).

Let me pass directly to Part II, dedicated to contemporary discussions of imagination. The first paper, "Imagination and mental imagery" by Dominic Gregory stresses the important role of mental images, but adds that "there are, (…), reasons for thinking that sensory mental imagery is not essential to the imagination, (…) The relationships between sensory mental imagery and the imagination are thus notably complex and—like so many of the philosophical areas to which the imagination is central—ripe for further investigation" (107). Bence Nanay in chapter 9, "Imagination and perception" also focuses on image-based imagination. With apologies, I shall skip interesting chapter on "Imagination and belief" by Neil Sinhababu, the one on "Imagination and memory" by Dorothea Debus, one on "Imagination, dreaming, and hallucination" by Jonathan Jenkins Ichikawa and the final one, by the editor of the volume, "Desire like imagination", and recommend them to reader's attention. I also skip part III Imagination in aesthetics, with interesting papers by Nick Wiltsher and Aaron Meskin, James O. Young, Kathleen Stock and Stacie Friend.

So, we now pass to Part IV, "Imagination in philosophy of mind and cognitive science". Let us start from a paper that raises some epistemologically crucial issues. What is the relationship between imagination and rational thought? Are they connected and if yes, what does connect them? Ruth M.J. Byrne, in her "Imagination and rationality" suggests "that counterfactuals provide an important bridge between reasoning and imagination …" (339). The rationale is the following: "Imagination and reasoning depend on the same sorts of underlying computational processes: reasoning depends on cognitive processes that support the imagination of alternatives, and imagination depends on cognitive processes that are based on the same core processes". (Ibid.) She notes that imagination shows an interesting structure: "Remarkably, most people tend to change the same sorts of things in their representation of reality when they imagine an alternative to it, almost as if there were "fault lines" in their representation of reality, junctures or

joints that most people zoom in on to imagine how things could have taken a different turn" (341).

Now, what are the "core processes" that support our imagination of alternatives? Byrne appeals to the notion of mental model that she has been developing for decades together with Philip Johnson Laird. The crucial claim is that "people make inferences by constructing and combining mental models." (348). A mental model is an iconic or analog device, it looks (at least to me) that this iconic character is in many respect analogous to image-based of pictorial nature of many episodes of imagining.

It seems that Byrne supports a strong claim: the thinker does not reason *about* the model using non-iconic devices (a digital language, or…), but rather *in* the model; however, the phrasing is mine, not Byrne's, and she is not very explicit about the matter. However, her work does point in this direction, and this is the way she and Johnson Laird are standardly understood (e.g. by Keith Stenning and Michiel van Lambalgen in their (2008) book, *Human Reasoning and Cognitive Science,* A Bradford book, MIT, ch.10.6). Let me call this view "the pure model-theoretic view of inferences".

Let me note that there is an obvious, more "hybrid" alternative, which sees iconic model as indispensable starting point for reasoning, but leaves space for computational, for instance deductive or propositional, variants of reasoning. Stenning and van Lambalgen argue that the need for such reasoning is present even in the original iconic case, and criticize Byrne and Johnson Laird for not having noticed it. Authors that Byrne herself quotes, J.S.B.T Evans, and D.E. Over, lean more in the same direction. Evans, for instance, describes his models as "epistemic", represented what thinker takes oneself to believe; this allows assignation of degrees of belief to the model, and then thinker's probabilistic reasoning *about* mental models, rather than *in* them. Thomas Metzinger seems to go in the same direction (e.g. in his *Being no one-The Self-Model Theory of Subjectivity* (2004), A Bradford book, p. 62), and the more recent work by Jakob Hohwy (in his *The Predictive Mind* from 2013, OUP) is dedicated to the analysis of hypothetical very rich Bayesian reasoning allegedly done by thinker's cognitive machinery *over* the initial perception grounded mental model(s). (See also Chris Frith (2007), *Making up the Mind How the Brain Creates our Mental World*, Blackwell, p. 126ff.)

The hybrid alternative is slowly winning.

The authors just mentioned do not talk much about imagination. How would the "hybrid" approach answer Byrne's initial question concerning the bridge between reasoning and imagination? One could bring together two kinds of processes: first, the imaginative reasoning grounded in image-like pictorial episodes, and second, the ordinary reasoning grounded in iconic mental models. The second element can be understood either in the pure (Johnson Laird, R. Byrne) way, or in the hybrid way. The two elements seem analogous, and one might suppose that there are causal connections between some episodes of the first, and some of the second element. Suppose, to borrow an example from Tim Williamson, that I ask myself the following vital question: "Can I jump across the river?" I imagine myself jumping from here, or from there, or from a more distant bend. Imagination caters for the singularity of the configuration: this shape of the riverbank

here, the other shape, and so on. I conclude with a counterfactual: Were I to jump from here, I would break my leg.

On the hybrid view, I need information about probabilities, and, equally on the hybrid view, it comes from my spatial-kinematic-and-dynamical mental models. (I might build three models on the spot, using perceptual material plus memory material from my mountaineering experiences). My cognitive mental computer calculates some constraints, Bayesian or others, valid for (on) such models. The models are then stored in my memory, and they will *constrain my imagination* next time when I find myself in a same or similar situation. Imagination feeds models (helps build them) and models, on their part, constrain the exercise of the imagination.

Several papers in the present part concern the role of imagination in understanding other people and our reactions to them. The central phenomenon in play here is mental simulation.

In her chapter "Simulation theory" Shannon Spaulding offers clarificatory and classificatory information that is extremely useful, given that the term "simulation" is used in many senses in the literature, and there is clear need to distinguish them to avoid very bad confusions (her own stance, critical toward the power of simulation, is put forward in her contribution to another collection, due to A. Kind and Peter Kung, (2016), *Knowledge and imagination*, OUP).

Spaulding starts from Alvin Goldman's proposal according to which a process P simulates process P' if and only if first P duplicates, replicates, or resembles P' in some significant respect and two, in its duplication of P', P fulfills one of its purposes or functions. In the case of mindreading simulation, the purpose or function of is to understand target's mental states. She then introduces the crucial distinction between abstract and concrete simulation, the first including activities like computer simulation and the like, and the second being the psychological simulation that involves "sameness of system and fine grained process" (264). The distinction is very helpful, and could save writers from confusions that mark the scene of present-day investigation of simulation.

Spaulding next distinguishes high-level from low-level simulation. She lists three characteristics of the former. First, it "involves imagination in the conventional sense" (267). Second, it explains our engagement with fiction, where we put ourselves "in the fictional character's position and imagine what we would think, feel, and do in that situation. Third, it explains how one can get knowledge through simulational imagination, so that if could be "co- opted to explain how some thought experiments work" (267). In contrast, in low level simulation, "imagination operates unconsciously and automatically."

Let me mention papers which I did not review here. First, the paper on "The cognitive architecture of imaginative resistance" by Kengo Miyazono and Shen yi Liao, that I shall say a few words about in a moment. Next, "Imagination and the Self" by Dilip Ninan, Greg Currie's "Imagination and Learning", Neil Van Leeuwen's "Imagination and action", Deena Skolnick Weisberg's "Imagination and child development" and finally "Imagination and pretense" by Elizabeth Picciuto and Peter Carruthers, and "Can animals imagine?" by Robert W. Mitchell.

Part V is dedicated to imagination in ethics, moral psychology, and political philosophy**.** Next two papers that I want to mention explore the consequences of mind-reading, especially the moral ones. Karsten R. Stueber in her "Empathy and the imagination" stresses the central importance of empathy for gaining access to other minds, and for linking us to our community. She leaves open the question "whether or not empathy has a more foundational role to play in constituting moral normativity" (377).

In his chapter on "Moral imagination" Mark Johnson provides a positive answer to the question and offers a sketch of an extremely pro-imagination oriented theory, of the kind he developed in his *Morality for humans* (2014) book. "Moral imagination", he writes "is our fundamental capacity to imagine how certain values and commitments are likely to play out in future experience…" (263). The quality of our moral thinking is thus "as much an affair of imagination as it is an appropriation of prior knowledge" (Ibid.). A crucial role in moral understanding is thus assigned to one particular kind of imagination, namely simulational, "empathetic" imagination. Indeed, moral deliberation itself is a process of "cognitive conative affective simulation. Simulation "activates emotional responses to the projected situations", thus permitting us "to give voice to various impulses, interests, and values ..." (364).

Unfortunately, Johnson does not clearly tell us how the emotional response to a situation, imagined or real, is related to its value. Empathy with a suffering person can tell me immediately that her situation is bad, of negative value, but this is just the beginning of the story. Is the 'telling' simply recording of a given axiological state, or is it, or some its more idealized version, constitutive of the value? Next, what about non-empathetic simulation? I imaginatively simulate the behavior of sea captains who are saving refugees in the Mediterranean, and I feel admiration for their action, experience it as being of a very high value. What is the relationship between simulation, admiration and value? In the paper, Johnson shows sympathy towards a reductionist account, that would explain value in terms of our coping with the world, but he does not develop it sufficiently for a curious reader.

As far as other prominent ethical alternatives are concerned, Johnson is very critical of what he calls "Moral Law" theory, with its abstract guiding principles. The reader rightly wonders how he would react to the Rawlsian attempt at reconciliation of various sources of moral wisdom. The attempt famously involves three elements: our spontaneous intuitions, the veil-of-ignorance procedure, which is itself simulation-involving (imagine yourself not knowing your particular characteristics, and imagine yourself living in such-and-such arrangement) but not empathetic, and the process of testing principles with the help of spontaneous intuitions. We can imagine that many spontaneous intuitions ("This is, or would be, a terrible deed!") come from empathetic simulation; principles come from neutral, veil-of-ignorance simulation procedure and the testing brings these components together. How close this alternative comes to Johnson's ideal would be a fine thing to know.

Part VI is dedicated to Imagination in epistemology, philosophy of science, and philosophy of mathematics, encompassing the paper by Greg Cur-

rie "Imagination and learning", Roy Sorensen "Thought experiment and imagination", Peter Kung "Imagination and modal epistemology", Adam Toon, "Imagination in scientific modeling" and Andrew Arana "Imagination in mathematics". Let me conclude by mentioning two claims by Sorensen which I find very congenial. First, he proposes that „we can run simulations that have some reliability because our imagination has been shaped by the environment." And notes that experience can improve the fit (431). He also praises modeling, noting that it "improves on the mind's eye level of resolution" and re-organizes our spatial imagination in a positive way. Modeling also overcomes our spatial imagination's bias in favor of alignment and against tilts (426). He is adamant about the role of evolution in shaping our imaginative capacities and making them fit the world. I agree completely.

In short, it is a very impressive collection on the epistemology of imagination, indispensable for anyone who is interested in the methodology of philosophy. I recommend it warmly to the attention of the readers.

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