

The Force of the Virtual: Deleuze, Science and Philosophy, Peter Gaffney (Ed.), Minneapolis: University of Minnesota Press, 2010, 393pp [final draft]

There are few better visits for future scientists and philosophers of science than a tour of Scott's ship, *Discovery*, in its dock on the river Tay in Dundee. Each part of the original ship and the attached visitors' centre provides a view into a branch of science, exploration, engineering and seamanship from the early nineteenth hundreds: cartography, geography, geology, engine design, food preservation and preparation, the science of diet, biology, seismology, physics, botany, the sociology of life led in close quarters, medicine, chemistry. *Discovery* carried Scott and his fellow explorers and scientists on the British National Antarctic Expedition from 1901 to 1904. Scott was to perish on Antarctica, in 1912, during the *Terra Nova* expedition.

Beyond that legendary tragedy, the visit to the ship is striking in its diversity. This variety is mirrored in the sciences today. Science is manifold, not only in terms of its disciplines, but also their methods, the different stages of experiment, establishment of theories and their overthrowing, and the variations in scientific tasks, from the patient collection of data, so well shown on *Discovery*, to the tentative and often controversial elaboration of theories, to the application of science to technological solutions, and to exploration 'where no man has gone before'. This multiplicity of science presents great challenges to anyone attempting a philosophical reflection on the relation of philosophy to science. Any account of this relation is prone to four allied yet distinct risks: science might be reduced in its plurality to fit a single philosophical model; philosophical distinctness as a subject with great historical range might be lost through a reduction to a given scientific moment or epoch; science might be misunderstood in its methods, epistemological claims or specific theories due to a gap between scientific and philosophical ideas of method, knowledge and theory; finally, different ideas of truth and consistency could be lost through a conflation of philosophy and science.

Peter Gaffney, the editor of [The Force of the Virtual](#), has given us a thoughtful response to these risks by providing us with a comprehensive tour of the relations of Gilles Deleuze and Félix Guattari's work to science (the elision of Guattari from the book's title is unfortunate given his extensive work on science and its influence on Deleuze). Instead of narrowing down their work to a single thesis, approach, science or method, Gaffney gives us a set of perspectives ranging from deeply philosophical and demanding reflections on Deleuze and Guattari's concepts (by Villany, Flaxman, Kelso and Gaffney), to accounts of their relevance to modern technical sciences (architecture by Antonioli and digital machines by Evens), to critical essays (by Braidotti and Shaviro), works of cultural criticism (Pisters) and subtle analyses of the relations between Deleuze and Guattari and cutting edge science (by Bailey, Murphie and Plotnitsky). There is also an interview of the most important early interpreter of Deleuze's work in a scientific context, DeLanda, and an excellent overview by Gaffney in his balanced and subtle introduction. The quality of the essays is uniformly high and it is clear that each has benefitted from sustained editorial critique and review. It must be noted, though, that these values are not those of simple pedagogical presentation. This book is in no way an introduction to Deleuze and science for the uninitiated. It is a survey of some of the latest advanced work on Deleuze and science. As such it requires a high level of prior research, with the exception of the accessible introduction and the interview with DeLanda, which shows his usual outstanding communication skills.

In the interview, DeLanda takes me to task for not revealing whether I have idealist or a rationalist ontological commitments in my critical reading of his work on Deleuze and science. This matters for him because idealism leads to a 'bias towards a relativist epistemology' (329). I do not raise this question to turn this review towards my interpretation of Deleuze. Neither do I raise it to make the easy rebuke that idealism does not necessarily lead to relativist epistemological commitments. Idealists and realists disagree about what those commitments are about rather than their relativity, which is a secondary variable for both positions. Instead, I want to make the prior point that idealists and relativists share forms of scepticism before they arrive at their differing conclusions. Socratic Elenchus, Cartesian method of doubt, Humean scepticism, Kantian critique and Nietzschean irony and humour distinguish themselves from science through philosophical forms of scepticism, as opposed to the different forms of methodological sceptical approaches within scientific practice.

Intuitive and methodological scepticism provide useful analytical tools for understanding the works on Deleuze and science set out in the book. For instance, the chapters by Gaffney, Edens, Shaviro, Plotnitsky and Flaxman have a greater critical distance from Deleuze and Guattari's works and from contemporary science than some of the other chapters. This allows them to test the philosophical ideas more carefully and with greater balance in relation to opposing views, than chapters which sometimes let wonder at scientific advances, or admiration for conceptual innovations overcome critical distance. Thus Braidotti's laudable ethical desire to follow on from Deleuze and Guattari's affirmation of the 'nomadic' in the sciences benefits from being read alongside Shaviro's careful consideration of Deleuze alongside Kantian critique and Whitehead's speculative philosophy. There is of course room for both of the values of wonder and scepticism in approaches to philosophy and science. It is another benefit of the pluralism of this collection that it brings us essays covering the full spectrum, running from the full blown and intricate adoption of Deleuze and Guattari's ideas, with Villany, to Plotnitsky's exemplary analyses of cutting edge science of the brain and its implications for philosophy 'after' Deleuze and Guattari's What is Philosophy?

Multiple perspectives are valuable, then, but they also raise the question as to what justifies bringing them together. Does this collection allow us to draw any general conclusions with respect to Deleuze and Guattari's work with science? There are two levels to be distinguished here. First of all, at the level of cultural and social interest in science, many of the chapters here demonstrate that the philosophers provide illuminating concepts for demonstrating how scientific discoveries and theories have become intrinsic to other modes of thinking. This is shown well by Pisters in her work on the brain and film, by Shaviro and Bailey in their work on biology and evolution, and by Murphie and Plotnitski again on neuroscience. Second, at the level of philosophy of science, as Gaffney shows in both his chapters, Deleuze and Guattari demonstrate a change in thought *around* science, in the sense of before, with and after. This change can be characterised as a search for new concepts that avoid earlier images and classifications of science, such as materialism and naturalism. In terms of these innovations, the concept of the virtual occurs in most of the chapters of the book. New sciences can be seen as sciences *of* the virtual, for example in Evens' study of the digital as not strictly virtual (157), and as explained *by* the virtual, for instance in Bailey's work on Edelman and Tononi (314). The division of the virtual into a realm or function of some kind and an explanatory concept allows us to understand the value of Deleuze and Guattari's work for science. On the one hand, they seek to explain how scientific discovery shapes new ways of thinking and living. On the

other hand, but within the same philosophical framework, they create shared concepts designed to articulate philosophy with science but without reducing one to the other.

Finally, returning to the risks implied by the reduction of science to philosophy or vice versa, the chapters in the book allow for an insight into two difficulties. First, the descriptive and conceptual richness of Deleuze and Guattari's work is sometimes in danger of hiding the methodological innovations in their philosophy. Having made convincing points about the potential for reading their work alongside science, the authors in this book therefore prepare the way for the unification of work on method in philosophy, by Dan Smith, Miguel de Beistegui, Anne Sauvagnargues and Levi Bryant, for instance, and the descriptive work on science. Some of the issues at stake include questions of the difference between a demand for philosophical consistency and scientific explanatory power. Though unity may be desirable in explanation, it is not a precondition, whereas the demand for consistency generates Deleuze and Guattari's philosophical systems. They are exceptionally robust because of this demand. Second, the multiplicity of approaches in The Force of the Virtual raises a difficult point with respect to a possible hierarchy of the sciences in relation to philosophy. Should we take mathematics or biology, or the neurosciences, or chemistry, as the fundamental science for Deleuze and Guattari's work? Or is this question a false start which asks us to make an impossible or mistaken choice (but if so why)? Until we can answer these questions, it will be exceptionally hard to relate Deleuze and Guattari's work to other philosophies of science and philosophies grounded in the sciences, where commitments to specific sciences are much more clear, for instance to mathematics, physics or biology. It is to Gaffney's great credit that he has drawn together a strong collection that demonstrates the importance and fruitfulness of such questions.

James Williams, Edinburgh 2012