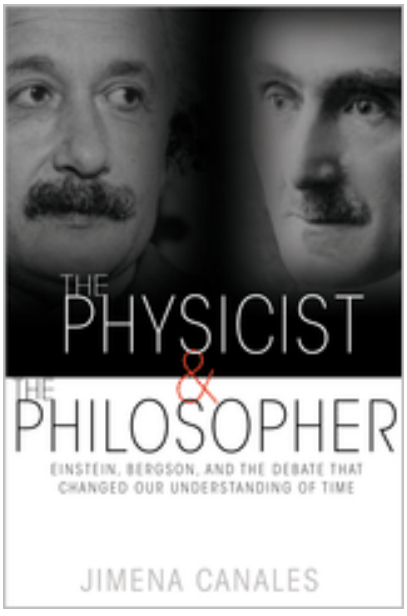
Jimena Canales: The Physicist and the Philosopher: Einstein, Bergson, and the debate that changed our understanding of time

Title: The Physicist and the Philosopher: Einstein, Bergson, and the Debate That Changed Our Understanding of Time
Author: Jimena Canales
Publisher: Princeton University Press
Release Date: 2015
Format: Paperback $24.95
Pages: 488
Reviewed by: Juljan Krause (London School of Economics)



Relative Times

It is not easy being a philosopher these days. Many contemporary scientists, particularly physicists, dismiss philosophy with a cavalier wave of the hand. 'Philosophy is dead', Stephen Hawking and Leonard Mlodinow claim right on the very first page of their *Grand Design*. In the centuries-long struggle for discovery, philosophy has run out of breath. 'Philosophers have not kept up with modern developments in science, particularly physics. Scientists have become the bearers of the torch of discovery in our quest for knowledge', they argue (2010: 5).

The statement encapsulates neatly how the tables have turned. Indeed, philosophy has been on a long and circuitous journey. The ultimate arbiter of what it means to be doing science only a couple of centuries ago, philosophy today finds itself appraised, assessed and oftentimes outright dismissed by other disciplines. Physicists of late are particularly blunt. Philosophy emerges as an anachronistic, antediluvian body of thought, burdened with way too much conceptual baggage and confusion. Why ask all these long-winded questions? 'My concern here is that the philosophers believe they are actually asking deep questions about nature. And to the scientist it's, "What are you doing? Why are you concerning yourself with the meaning of meaning?"', wonders astrophysicist and 'science communicator' Neil deGrasse Tyson (2014).

Philosophy today has nothing to add to the table, the argument goes. Theoretical physicist Lawrence M. Krauss finds that 'philosophical speculations about physics and the nature of science are not particularly useful, and have had little or no impact upon progress in my field' (2012). Usefulness and empirical power crystallize as the central hallmarks of validity and value, criteria against which philosophy must be judged. Here, Krauss echoes the long-standing sentiment in twentieth-century physics that philosophy is first and foremost a conceptual toolbox for the practice of doing science. Alas, its tools are rusty, clunky, and have fallen into desuetude. In the 1990s, physicist and Nobel laureate Steven Weinberg puffed that there was 'no one who has participated actively in the advance of physics in the postwar period whose research has been significantly helped by the work of philosophers' (92). Philosophical insights are, at best, 'murky and inconsequential compared with the dazzling success of physics and mathematics' (92, cf. Mason 1997). In the 1960s, fellow physicist and Nobel laureate Richard Feynman famously quipped that the 'philosophy of science is as useful to scientists as ornithology is to birds' (Feynman in Trubody 2016). Not unlike the platitude that society requires engineers to build bridges but no one needs

economists to run an economy, philosophy emerges as lacking an object, a *raison d'être*.

If and when philosophy is useful, it is actually physics in disguise, many physicists seem to believe. 'There have been people who one can classify as philosophers who have contributed usefully to this discussion [of quantum mechanics], but when they have, they have been essentially doing physics, and have published in physics journals' (Krauss 2012). Philosophy in itself has no domain. In an interview with philosopher Julian Baggini, Krauss expatiates that there were only two possible kinds of questions, those 'that are answerable and those that aren't' (*The Guardian* 2012). Needless to say that all the 'answerable ones end up moving into the domain of empirical knowledge, aka science'. Not surprisingly, for Krauss, unanswerable questions are pointless to bother with. Wittgenstein's seventh and final proposition in the *Tractatus* comes to mind. 'What we cannot speak about we must pass over in silence' (2002: 89). If inquiry can only ever pertain to the realm of the empirical, which only physics, however, can inquire into, then there is no place for philosophy in this world. There are no Nobel Prizes to be won for mere speculation about that which stubbornly resists the empirical. Quite naturally, physicists are the better philosophers, Krauss seems to suggest. 'Philosophy used to be a field that had content, but then 'natural philosophy' became physics', to the effect that it now 'encroaches on these areas that philosophers have carefully sequestered away to themselves, and so then you have this natural resentment on the part of philosophers' (2012).

What has happened over the past one hundred years? The 'encroachment' of physics on traditional philosophical fields that Krauss identifies has a long history, of course. Harvard-trained Jimena Canales, historian of science at the University of Illinois, locates the origins of the rift between physics and philosophy in the somewhat overlooked debate between Henri Bergson and Albert Einstein. The two met in Paris in April 1922 to debate the nature and qualities of time. At the time, Bergson's popularity, both inside and outside academic circles, had reached levels hitherto unknown to philosophers. Bergson attracted large crowds to his public lectures and talks, and was incredibly popular among avant-garde circles in Europe and North America. His popularity was at its peak when he should clash with Einstein at their public debate in Paris, which is the topic of this hugely insightful, lucid and impeccably researched book.

Canales demonstrates powerfully and with incredible attention to detail just how damaging Einstein's relativity theory proved to the public perception of Henri

Bergson's philosophy of time. "The time of the universe' discovered by Einstein and 'the time of our lives' associated with Bergson spiraled down dangerously conflicting paths, splitting the century into two cultures and pitting scientists against humanists, expert knowledge against lay wisdom', she argues (2015: vii). For Canales, the debate between Einstein and Bergson in Paris in 1922 was a defining moment in the history of science and philosophy. Einstein famously claimed that there was no 'philosophy of time', just the time of physics. In relativity theory, there is no place for phenomenologies of time, its subjective experience. What matters is the relative velocity at which two objects travel in space. Of course, Einstein did not dispute that people may differ in their perception of time, and experience the passage of time in different ways. Neither would he deny that these differences are meaningful. However, he did reject the idea that these differences could have anything to do with the nature of time as such. If anything, they are due to differences in people's psychological makeup. Questions about perception, duration, and experience are not metaphysical questions, they are questions that concern the experiencing subject. The time of physics is all there is, which is expressible in terms of laws of nature that are irrespective of experience. As far as Einstein was concerned, the study of our experience of time could be left to psychology. There simply was no place for the kind of philosophy of time that Bergson envisioned.

Canales does a wonderful job in tracing the repercussions of Einstein's rise to fame for philosophy. The public debate, where Bergson gave a long and detailed speech and Einstein only talked for a couple of minutes, had proved tricky business for Bergson. Unlike Einstein, he was concerned with the distinctly human element in discussions of the nature of time. 'Something different, something novel, something important, something outside of the watch itself needed to be included in our understanding of time. Only that could explain why we attributed to clocks such power: why we bought them, why we used them, and why we invented them in the first place' (43). Notably, German sociologist Georg Simmel had theorized about the particularly cultural and economic dimensions of clock time as early as 1903. 'Metropolitan life', Simmel argues, 'is not conceivable without all of its activities and reciprocal relationships being organized and coordinated in the most punctual way into a firmly fixed framework of time which transcends all subjective elements' (Simmel 1903: 105). Einstein's relativity theory, of course, dethrones human subjectivity or larger social structures as defining features of time. Anthropocentric concerns about meaning and perception do not matter for understanding space-time; what matters is the relative speed and distance between observers. The debate between Einstein and

Bergson marked the beginning of a history of encroachments on philosophy, and it left Bergson's reputation damaged.

The chief reason for this damage was that proponents of Einstein's theory were successful in claiming that Bergson and his followers did not quite grasp the mathematics of Einstein's work. Many contemporary philosophers will be familiar with this sort of charge as well. With the advancement of relativity theory, physics had certainly become so sophisticated in technical terms that many philosophers found it increasingly difficult to follow. However, Canales defends Bergson vigorously at this point (chapter 2). Bergson's reputation took a hit when he claimed that two clocks would still show the same time, even if they'd travelled at significantly different velocities – the whole point of Einstein's theory was to demonstrate that they will indeed differ. Differences between the elapsed time between two events measured by two observers that travel at different velocities through space are due to the nature of spacetime, not mechanical issues of measurement. However, what Bergson meant when he said that clocks will show the same time regardless of velocity, was that the cultural and social contexts will not have changed. He challenged Einstein for making philosophical claims while insisting that he were talking physics only.

Canales seems to imply that Bergson consciously contradicted Einstein but didn't mean to refute or repudiate the experimental validity of Einstein's claims. Rather, he was concerned with a very different realm that the notion of time can pertain to, i.e. that of human experience. It's a mistake to reduce Bergson's reading of Einstein in this context to a couple of brief citations that are out of context. Canales shows that 'Bergson was concerned with the questions of how, why, and under what circumstances should the clock-delays described by relativity theory be unambiguously considered as real temporal changes' (41). Bergson questioned if Einstein was in a position to make such sweeping comments about time that aimed to remove philosophy from the picture entirely. 'Bergson refused to grant Einstein the authority to do this' (42). For Bergson, time was not something external but involved human consciousness at all levels.

Einstein himself radically departed from the standard way of 'doing physics' at the time, as Peter Galison explains. 'Part philosophy and part physics, Einstein's rethinking of simultaneity has come to stand for the irresolvable break between modern physics and all earlier framings of time and space' (2004: 12). Einstein's project, the groundbreaking, paradigm-shifting reformulation of the fundamental principles of physics, necessarily stretched across disciplinary boundaries.

'Einstein saw the coordination of time, and indeed his physics and his philosophy more generally, as part and parcel of the same critical reevaluation of the founding assumptions of the disciplines' (30). Philosophers of the day, who were insufficiently conversant with the mathematics of Einstein's model, were understandably concerned about his incursion into their domain. 'We had all become defeatists, and drew into our own shells, where we might hope to withstand the assaults of the mystical giant Abracadabra, who could make the less appear the greater length', a then-contemporary commentator recalls (Canales 2015: 189). Contemporary physics' imperialism, as expressed in Krauss' comments about the lack of use value of philosophy, has its ideological roots in the 'assault' on philosophy nearly one hundred years ago.

There is a curious dialectic in Einstein's relativity theory. On the one hand, it debunks Newtonian mechanics, and the notion of universal time. 'Tides, planets, moons—everything in the Universe that moved or changed—did so, Newton believed, against the universal background of a single, constantly flowing river of time' (Galison 2004: 11). Since Einstein, time dilation has become such a popular concept that the expression 'time is relative' has become a household phrase. On the other hand, time's relativity is of such a fundamental nature that it is turning into a universal in the sense that it requires no further philosophical investigation, demands no further insights of the kind that Bergson could contribute. For Einstein, there is no point in philosophizing about time to begin with. 'Hence there is no philosopher's time; there is only a psychological time different from the time of the physicist', he claimed (cf. Canales 2015: 357). The philosophy of time is reduced to 'psychology', and therefore subjective and largely irrelevant to the physicist's sophisticated talk about ultimate cosmological questions. Time is relative, but it is not relative enough for anyone outside physics to make ontological claims about its nature. 'Because of the enormous speed of light, humans had "instinctively" generalized their conception of simultaneity and mistakenly applied it to the rest of the universe. Einstein's theory corrected this mistaken generalization. Instead of believing in an overlapping area between psychological and physical conceptions of time (where both were important although one was admittedly less accurate than the other), he argued that they were really two distinct concepts: a mental assessment (the psychological one) that was wholly inadequate when compared to the "objective" concept: physical time', Canales explains (47).

Bergson never fully recovered from the blow Einstein's theory would strike against phenomenologies of time. The split was done; physics had been victorious

in re-appropriating an important philosophical field. 'The years that followed their encounter in Paris can be compared to those of the religious wars– with one major difference: instead of debating about how to read the Bible, thinkers across a wide variety of disciplines debated about how to read the complex unfolding of nature through time', Canales writes (15). The book does an utmost impressive job in tracing the fallout of Bergson and Einstein's encounter. It certainly makes a gripping read; it is in parts a towering intellectual, cultural and political history of the first half of the twentieth century and in other parts a carefully crafted novel, written immensely elegantly throughout. Canales connects the fundamental issues in science and philosophy that the debate uncovered with a broader discussion of the role of dichotomies in the history of science and philosophy. She also makes room to discuss in detail the views of then-contemporaries like Bertrand Russell and Alfred North Whitehead. Whitehead endeavoured to contribute his very own version of relativity theory that aimed to do justice to the experimental findings of physics at the time, yet incorporates 'immediate experience' in such a way that nature is not 'bifurcated' (Whitehead was an outspoken critic of Einstein's attempt to separate the realm of experience from metaphysical inquiry).

The book is incredibly well researched; there is no statement that Canales could not back up with references to original sources. Rather than taking sides, the author lets Bergson and Einstein speak for themselves, carefully contextualizing their dispute. Despite their differences, both thinkers would hold each other in high esteem throughout their lives. The last two chapters of the book discuss letters from Bergson and Einstein's final days that show their deeply engrained respect for each other. Despite his earlier insistence on the clear separation between subjectivity and objectivity, and between science and 'psychology', Bergson's work had left a mark on Einstein, who, in his later years, had grown much more curious about the import of philosophy on science. Bergson did not argue for nothing. As A. J. Ayer commented, 'The metaphysician is treated no longer as a criminal but as a patient: there may be good reasons why he says the strange things that he does' (347).

References

Canales, Jimena (2015), The Physicist & the Philosopher: Einstein, Bergson, and the debate that changed our understanding of time, Princeton NJ: Princeton University Press

Galison, Peter (2004), Einstein's Clocks and Poincaré's Maps: Empires of Time, W.W. Norton

The Guardian (2012), 'Philosophy v science: which can answer the big questions of life?', Interview with Julian Baggini and Lawrence M. Krauss, available at https://www.theguardian.com/science/2012/sep/09/science-philosophy-debate-julian-baggini-lawrence-krauss (retrieved on 01 November 2016)

Hawking, Stephen and Leonard Mlodinow (2010), The Grand Design (New York: Bantam Books)

Krauss, Lawrence M. (2012), 'The Consolation of Philosophy', Scientific American, available at: https://www.scientificamerican.com/article/the-consolation-of-philos/ (retrieved on 01November 2016)

Mason, Richard (1997), 'The Unreasonable Ineffectiveness of Philosophy', Philosophy Now, available at https://philosophynow.org/issues /17/The_Unreasonable_Ineffectiveness_of_Philosophy (retrieved on 02 November 2016)

Northrop, Filmer S. C. (1941), 'Whitehead's Philosophy of Science,' in The Philosophy of Alfred North Whitehead, ed. by Paul Arthur Schilpp (Evanston IL: Northwestern University Press)

Simmel, Georg (1903), 'The Metropolis and Mental Life', in The Blackwell City Reader, ed. by Gary Bridge and Sophie Watson (2010), Wiley-Blackwell

Trubody, Ben (2016), 'Richard Feynman's Philosophy of Science', Philosophy Now, available at https://philosophynow.org/issues /114/Richard_Feynmans_Philosophy_of_Science (retrieved on 02 November 2016)

Tyson, Neil deGrasse (2014), 'Episode 489', Nerdist Podcast, available at: http://nerdist.com/nerdist-podcast-neil-degrasse-tyson-returns-again/ (retrieved on 01 November 2016)

Weinberg, Steven (1992), Dreams of a Final Theory, New York: Vintage Books

Wittgenstein, Ludwig (2002), Tractatus Logico-Philosophicus (London: Routledge)

Wednesday January 18th, 2017 Juljan Krause Reviews

You must be logged in to post a comment.

ISSN: 2297-7627
© Phenomenological Reviews
Hosted by the Open Commons of Phenomenology
Powered by sdvig press
Imprint