

Out of Season

The neglect of Whitehead's alternative theory of gravitation as due to aesthetic induction by Einstein's general theory of relativity

Ronny Desmet

Abstract

From the 1920s to at least the 1970s experimental technology only allowed testing the predictions that Albert Einstein's 1915 general theory of relativity (GTR) and Alfred North Whitehead's 1920-1922 alternative theory of gravitation (ATG) have in common. Consequently, from an empirical point of view, and for at least half a century, the two theories were equally attractive. However, despite the shared empirical adequacy, even the physicists in Whitehead's homeland nurtured Einstein's brainchild and neglected Whitehead's. Clearly, empirical criteria of theory evaluation alone are insufficient to understand why the British physics community, as from the 1920s, favored Einstein's theory above Whitehead's.

In this paper, I argue that students of Whitehead can remedy their lack of understanding of the bad reception of Whitehead's ATG by taking into account, first, aesthetic next to empirical evaluation criteria and, second, James W. McAllister's theory of aesthetic induction. More importantly, looked at it from a philosophy of science angle, the story of the British evaluation of Whitehead's ATG in the 1920s can be conceived as a historical case study that supports McAllister's theory.

In his 1996 book, *Beauty and Revolution in Science*, McAllister holds that, when a scientific community evaluates a new theory, the degree of favor attributed to an aesthetic property of this theory is proportional to the degree of empirical success of established theories exhibiting this property. McAllister writes:

The degree of favor with which scientists have regarded an aesthetic property appears to have responded to the empirical performance of theories that possess that property. If a theory possessing an aesthetic property P scores notable empirical success, the community comes to regard P with increased favor and to expect future theories showing P to be successful too. On the other hand, if there later arise theories that lack P but are empirically more successful than the P-bearing theories, then the community's preference for future theories to show P wanes. (78)

Applying McAllister's theory of aesthetic induction to the case of Whitehead's ATG leads to the following story. In 1919 Einstein's GTR scored notable empirical success, and the British

physics community came to regard its aesthetic properties with increased favor. So when in 1922 Whitehead published the most detailed account of his ATG, and its aesthetic properties were observed to be quite *different* from those of Einstein's theory, British physicists did *not* favor Whitehead's theory: they did not perceive it as beautiful, and did not expect it to be successful.

Indeed, in the excitement of its sensational verification by Arthur S. Eddington in 1919, the British physics community attributed the very highest degree of empirical success to Einstein's 1915 GTR, hence establishing it as the most important cause of aesthetic induction in post-war physics. So when in the early 1920s Whitehead presented his ATG, and its aesthetic properties (its simplicity, intelligibility, metaphysical allegiance, etc.) were evaluated in comparison with the corresponding properties of Einstein's GTR, British physicists gave them low degrees of aesthetic value – Whitehead's ATG was conceived as less inevitable, less comprehensive, less parsimonious, etc. "It had come out of season" – these are the words Whitehead's biographer used to explain its lack of success. Here is the full quote:

Whitehead's theory did not fare well with physicists. Eddington, who had done much to get Einstein's work accepted, remarked in 1933 that he could now see that in some respects the philosopher's insight had been superior, but that it had come out of season for the physicist. (Lowe 1990:127)

In this paper, after giving a more detailed account of Whitehead's ATG, and of how badly it was received in the 1920s, even by the many high level mathematicians, physicists, and philosophers among Whitehead's friends, I try to put myself in the shoes of an average British physicist in the 1920s, who has to evaluate Whitehead's theory according to the empirical and aesthetic criteria that McAllister lists in his 1996 book. While performing this evaluation, I reach three important conclusions: Whitehead's ATG was experimentally indistinguishable from Einstein's GTR in the 1920s (and beyond); its aesthetic properties, however, were seen to diverge significantly from those of Einstein's theory; and the aesthetic induction caused by Einstein's empirically successful GTR has pushed Whitehead's ATG behind the scenes of the theatre of 20th century physics, where it was left for 21st century philosophers to rediscover.

Cited works

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