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## Studies in History and Philosophy of Modern Physics

journal homepage: [www.elsevier.com/locate/shpsb](http://www.elsevier.com/locate/shpsb)



### Why Einstein did not believe that general relativity geometrizes gravity



Dennis Lehmkuhl <sup>a,b,c,\*</sup>

<sup>a</sup> Faculty of Philosophy, University of Oxford, United Kingdom

<sup>b</sup> IZWT, Bergische Universität, Wuppertal, Germany

<sup>c</sup> Einstein Papers Project, California Institute of Technology, United States

#### ABSTRACTED STATEMENT FROM EINSTEIN:

As early as 1926 Einstein insisted, explicitly, that his work should *not* be understood as reducing physics to geometry, either his work on GR or his (and Weyl's and Eddington's) work on a unified field theory of gravitation and electromagnetism. Interestingly, what seems to be Einstein's first clear statement on the matter was prompted by a letter from Hans Reichenbach. Reichenbach was at the time engaging with Weyl's and Eddington's theories, and wrote Einstein that he thought that seeing electricity as geometrical in Weyl's theory is not more than an illustration (*Veranschaulichung*), one that, he argued, is equally possible (and equally trivial) in GR.<sup>5</sup> Einstein agreed wholeheartedly, writing<sup>6</sup>

You are completely right. It is wrong to think that 'geometrization' is something essential. It is only a kind of crutch (*Eselsbrücke*) for the finding of numerical laws. Whether one links 'geometrical' intuitions with a theory is a ... private matter.

In other words, the common misconception of gravity as a geometric curvature of spacetime is wrong. Einstein himself stated that his theory of general relativity only used geometry as a means to produce numerical results, nothing more. The true nature of gravity still remains to be discovered, although recent theories have linked both gravity and inertia to the quantum vacuum field.