

ZMATH 2015d.00030

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Mathematics and physics: the idea of a pre-established harmony.

Sci. Educ. (Dordrecht) 24, No. 5-6, 515-527 (2015).

Summary: For more than a century the notion of a pre-established harmony between the mathematical and physical sciences has played an important role not only in the rhetoric of mathematicians and theoretical physicists, but also as a doctrine guiding much of their research. Strongly mathematized branches of physics, such as the vortex theory of atoms popular in Victorian Britain, were not unknown in the nineteenth century, but it was only in the environment of fin-de-siècle Germany that the idea of a pre-established harmony really took off and became part of the mathematicians' ideology. Important historical figures were in this respect David Hilbert, Hermann Minkowski and, somewhat later, Albert Einstein. Roughly similar ideas can be found also among British theorists, among whom Arthur Eddington, Arthur Milne, and Paul Dirac are singled out. Although largely limited to the period 1870–1940, the paper also considers Max Tegmark's recent hypothesis of the universe (or multiverse) being a one-to-one reflection of mathematical structures.

Classification: A30 M50

Keywords: history of mathematics; history of physics; mathematics and physics

doi:10.1007/s11191-014-9724-8