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Peer Review

Review of: "Do We Understand Heredity and Evolution? No"

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This paper provides a valuable historical analysis of the development of the genotype-phenotype concept in the early decades of the 20th century. It brings into perspective a number of long-forgotten theoretical and experimental debates that preceded the eventual dominance of the Mendelian paradigm and helps to explain why this concept eventually became the received view for most of the remainder of the 20th century. As a historical re-examination of this debate exploring the way that various non-scientific factors led to this oversimplified biological paradigm, it is quite instructive. However, the value of the historical analysis stops there. This is because the author follows this reconstruction of the early days of the genetic theory of inheritance by cherry-picking the few studies produced over the subsequent century that provide results that are antithetical to this simplistic view. In the process, he ignores the vast history of biological studies that were in one way or another influenced by this idea, including notably the discovery of the structure of DNA. Such a massive oversight makes this highly selective historical analysis of questionable validity. If the paper had only analyzed this historical moment to expose the complex interplay of the many factors—both scientific and sociological—that led to the acceptance of one view over the alternatives, it would have been sufficient. But the discussion quickly turns polemical, and the author uses this truncated historical analysis to justify claims of unscientific and even disingenuous biology.

Historians of science often point out that although most theoretical paradigms are eventually shown to be overly simplistic and wrong in their details, their value to science is better assessed in terms of the way they inspire future empirical research, both critical and supportive. This can certainly be said of the genotype-phenotype hypothesis that, over the subsequent century, has given rise to the explosive development of molecular biology. So, although there are still introductory textbooks and popularizations that parrot this Mendelian caricature of inheritance, it has long been recognized as a

 doi.org/10.32388/7W439U

simplistic oversimplification. I would welcome further analysis of how the genotype-phenotype paradigm influenced the subsequent history of theoretical and empirical studies in evolutionary and molecular biology, exploring how this conception has changed as a result. But in its current form, this paper only provides an incomplete and biased historical analysis that fails to adequately support its polemical conclusions.

Declarations

Potential competing interests: No potential competing interests to declare.