



REVIEW: David Tyfield, *The Economics of Science: A Critical Realist Overview, Volumes 1 and 2*

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Source: *Spontaneous Generations: A Journal for the History and Philosophy of Science*, Vol. 7, No. 1 (2013) 94-96.

Published by: The University of Toronto

DOI: [10.4245/sponge.v7i1.18795](https://doi.org/10.4245/sponge.v7i1.18795)

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Published online at jps.library.utoronto.ca/index.php/SpontaneousGenerations
ISSN 1913 0465

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REVIEWS

David Tyfield. *The Economics of Science: A Critical Realist Overview, Volumes 1 and 2*. 232+248 pp. London: Routledge, 2011.*

Mike Thicke†

David Tyfield's two-volume *The Economics of Science* is an ambitious attempt to explain recent developments in economics of science using a critical realist/Marxian framework, and at the same time to unite critical realism with science and technology studies. The first volume consists of empirical illustrations of Tyfield's approach along with some philosophical arguments for critical realism in general and a Marxian approach to the economics of science specifically. The second volume focuses on achieving a synthesis between Tyfield's approach, science and technology studies, and evolutionary economics.

The growing number of intellectual property claims in science—most visibly, in the form of patents and the increasing focus by universities on for-profit research—has been the subject of much recent work in STS. Even mainstream philosophers of science, notorious for considering science in a highly abstract form disconnected from its political and economic reality, have begun devoting attention to these developments (eg. Radder 2010). As Tyfield argues, however, a significant problem with previous work in STS, the economics of science, and the philosophy of science is that none have explained why these changes to science are occurring, and why they are occurring now. Philosophers of science, for example, concentrate on the effects of these changes on science, and most of the work in the diverse approaches to the “economics of science” has either been devoted to answering other questions, or has failed to consider the political context or the content of the sciences. Tyfield convincingly argues that we need to consider both in order to understand these worrying developments in the economics of science.

Tyfield has previously published on the economics of scientific research within China, and his comparison of the commodification of science in China with that of the West is detailed and illuminating. The Chinese political system, where the state drives changes in the way scientific work is organized as part of its overall economic plan, has created differing paths in the commodification of scientific research. This empirical investigation effectively demonstrates his

* Received 25 October 2012.

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argument that we cannot understand the changes occurring in science without also understanding their political context.

Perhaps the strongest chapter of the book is Tyfield's explanation of the expansion of intellectual property claims in science. Tyfield notes in his introduction that one of his goals is to explain "why these changes in the economics of science [are occurring], in these places, and now" (pg. 13)? His account, which links the financialization of the economy which began in the Reagan/Thatcher era, the exhaustion of the chemical and electrical sectors as sources of innovation, the lobbying efforts of pharmaceutical corporations, and the nature of biotechnology, provides a convincing narrative.

Tyfield's framework rests on the foundations of the labour theory of value and a version of Kant's transcendental argument. Although from a theoretical point of view the former has numerous difficulties, one of its chief virtues is its shift of focus from products to producers. It encourages us to think of a T-shirt or a can of Coke as "congealed labour" rather than as inanimate objects subjected to the forces of supply and demand. In the closing chapters of the second volume, Tyfield attempts to use this explanatory power to transform the discourse of economics of science from the "knowledge economy" to the "skillful society"—moving away from thinking about science as a set of finished knowledge products towards the view that it is a process of learning by cooperating individuals.

Kant's transcendental arguments began with obvious premises about our mental states and reasoned towards controversial conclusions about the external world. Arguments of this sort are at best highly controversial, and thus do not provide a solid foundation upon which to build a theoretical framework. However, Tyfield's version, adopted from Roy Bhaskar's critical realism (Bhaskar 1978), has some promising features. His basic strategy is to ask: what does the commodification of science presuppose? It is transcendental in that it seeks to move from an uncontroversial premise (that scientific research can be commodified) to controversial conclusions about what must be the case in order for that premise to be true. In contrast to Kant's argument, Tyfield's argument is supposed to be tentative; the result of his transcendental reasoning might be that, because the conclusions are untenable, the supposed uncontroversial premises might be judged false. In the context of economics of science, Tyfield argues that, for the commodification of scientific knowledge to be successful, markets for knowledge have to be created, and knowledge has to be made objectively quantifiable. He then argues that the difficulty of such quantification explains many features of the current institutional apparatus developed in order to establish intellectual property rights. This is an interesting and original line of reasoning, as very little attention has been given by other studies of the economics of science to the commodification of scientific knowledge and the its implications.

Overall, *The Economics of Science* is a valuable contribution to the genre, a book that sociologists, economists, philosophers, or others concerned with the economic circumstances of science will find worth reading. Tyfield's writing style is often dense, and I am suspicious of his framework from a theoretical perspective. However, this does not detract from the book's chief virtues—its insistence that we take the implications of knowledge commodification seriously, and that we attend to the need to understand why these changes we see in science are occurring now and in the ways that they are.

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