Review of: "Straightening the ‘Value-Laden Turn’: Minimising the Influence of Values in Science"

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Potential competing interests: No potential competing interests to declare.

One could take science as providing objective information about the world immune from biases and prejudices. This is in tune with conventional wisdom about science usually adopted without scrutiny. However, recently conventional wisdom has been challenged systematically. In this regard, this paper is no exception. However, it has gone further to unearth the acrimonious nature of science and how it both shaped and influenced western history of physics during the late 18^{th} and early 19^{th} centuries focusing on significant players on both countries across the channel. Chronicling the historiography of science, Kuhn argues that scientists who belong to competing paradigms inhabit two different worlds of ideas with their distinct inter-relational networks of concepts. The current paper exploits this Kuhnian idea by investigating the history of light controversy during the above-mentioned period. For instance, though Young takes recourse to a geometrical approach to the study of light, the French prefers algebraic calculus-based approach instead. Plus, it successfully argues how personal animosity between scientists, *not* necessarily revolving around the content of the emission theory and the wave theory of light, affected the trajectories of science.

The paper is a *new* contribution to this ongoing debate over the theories of light in a historical background and is *not* drawn on from the author’s previous paper (2022.)

We recommend the paper for publication provided the author revises it considering the following comments.

1. The paper pivots around three key players such as Young, Fresnel, and Argo. However, we do not see any discussion about when Argo was supposed to present his called “the crucial experiment” to clinch the wave theory of light. Some amount of discussion on this is worthwhile, if not much about it.
2. There is a standard account of Poisson spot (which is also known as “Argo’s spot) as being presented as a crucial experiment. (See, Bandyopadhyay, Brittan, and Taper, *Belief, Evidence, and Uncertainty: Problems of Epistemic Inference*, Springer, 2016, chapter 1.) It could be used as a foil to contrast the author’s detailed historical approach to the theories of light during that period or at the end of the paper to show how Argo’s verification of the spot predicted by Poisson on the basis of Fresnel’s wave theory at least for a time provided a crucial experiment in support of it.
3. Here are comments on the concluding section of the paper. The author discusses that though Young takes recourse to a geometrical approach to light, the French prefers algebraic calculus-based approach in the later part of the conclusion. In the first paragraph, the author could bring it back to point out that the emphasis on geometry rather than on calculus-based algebraic approach to science was a serious disagreement about how to do science correctly. So, it is *not* necessarily about personal acrimony that distinguishes the British school from the French school on the theory of

light. It is interesting to note that Duhem in *The Aim and Structure of Physical Theory* makes much of the fact that Descartes was the first to demonstrate the reducibility of geometry to algebra (viz., by way of analytic geometry) and that the continuing reliance of British scientists on geometry (and mechanical models, e.g., colliding billiards) demonstrated the latter's' dependence on what could be visualized, in contrast to the French endemic ability to deal by way of the "pure" analysis of concepts. I.e., he thought that there was a deep difference between the French and British "minds" which demonstrated the clear superiority of the French!

4. Here is a general comment about the French school education system back in 1980's. One of the reviewers of this paper asked his son's schoolteacher (his son studied in France in early 80's), during a parent-teacher session. "Madame," he said, "most of the students in your class (which was basically geometry) are having trouble grasping the material. He suggested that it was because from the outset the teacher dealt with *n*-dimensional geometry (and not, as was customary, with two- or three-dimensional applications) and dispense with constructions/diagrams). "Monsieur," she responded, "I couldn't care less whether most of the students do not understand. I am here to teach geometry, not to make sure that my students understand it. You don't understand that we French take up subjects in their complete generality and do not need the aid of drawn figures"! Thus, Duhem and before him Descartes followed this tradition.
5. There are some sentences which do not make sense. It is possible that the paper being reviewed is not properly downloaded. Here are some of the sentences which could locate the problems at stake. The last line of the abstract. "*Science is not only built up with Science."*What does it mean? Needs a clearer sentence.
6. It should be Snell's law before the section "Young's reaction." In the latter section, it needs to be corrected as well and to be written as 'Snell's law."
7. Before footnote 102, there is a typographical error. It should be "One of the questions."
8. There are lots of typographical errors in the paper that need to be removed.
9. The author could consult *Science Rules: A Historical Introduction to Scientific Methods* (Achinstein, ed. part III, The Johns Hopkins Press.) where there is a brief discussion of Young's wave theory of light with an extract from Young's Lecture 39 'On the Nature of Light and Colours.'