

# Review of: "Objectivity and Honesty in Science: The case of Light Interference Phenomena"

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**Potential competing interests:** No potential competing interests to declare.

Review for Objectivity and honesty in Science: the case of light interference phenomena

The main problem with this paper is that it is not easy to understand its status. So we can see several hypothesis for its goal.

1/ If it is supposed to be a research paper, then we can expect new ideas, an original theory, or the application of a theory to a case study. In this sense it would be of no interest, as the ideas that are developed have already been treated all over the XXth century – by famous epistemologists that absolutely everyone knows, like Kuhn or Feyerabend. The type of analysis is thus very old (more than half a century) and is adding absolutely nothing to the knowledge we have on the evolution of ideas or theories, and not much to the idea that “science is not pure objectivity”. In a way the author sounds so naïve in believing that a good scientist would be “recognized” or well treated. It is very well known that academies have always been the place where old knowledge is kept with great care and where all the energy of the members is put to keep away any new idea. One can refer to Weber, 1919, for the description of the way university really works. Not a single time in history has a new idea been accepted by those who were in good positions, advertising their own theory. The case itself could be of interest, but the paper needs to be purged of all moralistic approach “jealousy”, “career”, “mentor” – all these categories are just not defined in the paper, just like “objectivity”, which is the most important word of the whole paper and we have no idea what the author means by this word. (to be honest “objectivity in science” is a belief that is not a knowledge for those doing history of science, but a popular representation with little foundations).

As a scientific paper, this paper would need a tremendous work for building a relevant bibliography and theory framing to be acceptable. Indeed, citing authors is not enough, you need to cite historians with same or alternative interpretations of your topic, so that to start an academic discussion. I do not even think the historical work could be made more rigorous so that to reach academic standards: it is so far away and so many books and papers have already treated this type of topic! What is your scientific input?: this is a real question.

In terms of physics: how come the author feels allowed to forget that the particular definition of light is still in place, and made more vivid since quantum mechanics – which means that some sentences are just wrong! For example the third line of the conclusion states “for which the common conclusion seemed obvious” – which is meaningless: nothing is “obvious” is this story, we still have two theories that are applied for different observations, like Newton if we believe the author, just like those who were against the new theory disagreed also on the way to approach the problem and show it. We are

facing many interesting phenomena here, such as methodological imperialism, but they seem to be not identified by the author.

2/ If it is supposed to be journalism or vulgarization, then it could start to be more relevant, as it takes a nice example showing how difficult it is to have knowledge evolve in an academic context – and as a consequence it can reduce pretention of “science” as a good indicator for political decision in real-time. Scientism being one of the plague of our time, this paper could show that the “consensus” is so hard to break that we know that what is taught at university is most of the time wrong, being challenged at the very moment it is taught.

The paper could be organized to show this with no major problem. But the author needs to reduce two terrible tendencies:

The first terrible tendency is the naïve point of view stating that “science is objective”, which is perfectly wrong. Science is the process of knowledge production (among others: like intuition, spiritual experiments, empirical testing...) which originality is that it makes the experiment as explicit as possible, and reproducible by others so that they can check – at the minimum – that the same FACTS apply in other conditions. This enables to identify the conditions under which something is true or not, and step by step increase the data that are accepted by all humans. However, nobody has ever stated seriously (apart from idealistic popular representation) that science is objective. This is a real problem of the paper.

The second terrible tendency is the moral and projective imagination of the author who lists all the possible sins that humans can develop, so that to explain the failure of evolution of knowledge in the XIXth century. This view of human is extremely primitive and completely destroyed by the whole science of humans (sociology, history) and it is very surprising to find someone who pretends to be historian developing a motivational argumentation. You should stick to facts without developing about intentions, like “career” or “revenge”. This is way less interesting, and more personal, than the letters the author talks about. This is really fascinating, and could just be about “difficulties” and “steps” a theory had to go through, in the XIXth century, so that to be accepted. Any emotion or comment is useless and should be left to the reader.

In this perspective, you could make a nice text. For the moment, subjectivity is too overwhelming.

Explain what you add, what is known before and why you want to tell this story.

P 13 (3rd page in “Young and the French school”), what is said about Laplace is certainly already in other history books, please cite, especially because you make fast inferences.

P 15 How can you state that “Young clearly preferred geometry...” ? We know he states that .. but how do we know what he actually preferred? ... this is an example of useless inference.

In this area of the text, the explanation that is given for a fight between two approaches is envy / jealousy. I see a fight between two theoretical approaches, two relations to knowledge, two epistemologies, with one running an imperialist epistemology, the mathematical side. Why use basic psychology here, when the shapes taken by the observation of reality could explain the choices. ?

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P17 “Clearly” ? Why is it obvious ?

“as if he wanted to act alone” – he just acted alone, end of it – why imagine intention ?

Same with the hypocrisy of Arago. This is your view but what can justify this. Respecting social rules is what actors do all the time, then “hypocrisy” is the norm and does not explain much. “He could not say what he meant in these circumstances” is a possible concurrent interpretation, and you cannot decide which is good with what you describe.

P18 the discussion about Poincaré shows a central issue that the paper could talk about: the place of mathematics in the development of science – here we can see two view oppose. Review for Objectivity and honesty in Science: the case of light interference phenomena

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Arago’s thoughts is too hypothetical and of no interest, in this form, to the reader.

Conclusion. The whole paper is presented as a pale copy of Kuhn’s argument, stated as a demonstration about human spirit. This is not what you did and could be way more rigorous in the presentation of the very interesting facts you have. No need to talk about objectivity, which only bad scientists believe in, in the XXIth century. Read a book by Latour, and rethink your paper with a more descriptive view.

Then you will have a good vulgarization text.