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Peer Review

Review of: "Observers as Agents: Relational Epistemology from Physics to Ecology"

H. G. Solari[1]

1. University of Buenos Aires, Argentina

Observers as Agents: Relational Epistemology from Physics to Ecology

The order in which this article is read is important. Unless the reader is already familiar with particular situations considered in sections 2 and 3, and that familiarity is at the same level as the authors' knowledge (at times apparently deep but in other cases superficial), it is convenient to read the introduction and then jump to section 4 and perhaps section 5. Sections 2 and 3 are not well resolved; they lack detail and refer the reader to other voluminous papers and books with their own thesis only superficially related to the `present paper.

The starting point of this paper is that "The ideal of objectivity as observer-independent truth has shaped scientific thought since early modern times" and that to this view it can be opposed that "all knowledge is perspective-bound embedded, embodied, and enacted observers participate in constructing coherent accounts of reality".

On page 10 (section 4), we learn that "In observer-based epistemological frameworks, scientific objectivity does not imply the elimination of observer-dependence. Instead, objectivity emerges through structured relational translation rules that allow different observers to compare, reconcile, and validate their measurements and descriptions".

These central elements of the paper can be further elaborated. Let us repeat here what has been already published in [Solari, H. G., & Natiello, M. A. (2019). A constructivist view of newton's mechanics. *Foundations of Science*, *24*(2), 307-341] and recently exposed in a book rescuing the old epistemology (before the second industrial revolution): [Solari, H. G., & Natiello, M. A. (2025). Rational empiricism: The idealist view of (elementary) physics. (Open Books Lund University).] The central idea is simple:

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1. There is something outside us that has been called observable-reality (OR).

2. What is called objective knowledge is the knowledge of the OR, the encounter between the subject and the object (the concept of “idea” in Hegel).

3. Perspectives of the OR are obtained by the observers in their particular relation to OR.

4. Since what is real cannot be an opinion, two subjective views can be mapped one into the other, ideally without distortions.

These elements are in the paper under review. However, in the references cited, it has been shown that:

5. The mapping/translations between the observations of the real made by different observers organise as a group (the arbitrariness or particularism group).

6. The quotient between the space of observations and the arbitrariness group is invariant in front of the change of observers, i.e., it is perspective-free, objective.

7. For every observation Oa made by the observer “a,” the set of observations corresponding to the translation of the observation to any other possible observer (in group theoretical language: the orbit of Oa under the arbitrariness group) is invariant, i.e., objective.

In short: intersubjective knowledge implies objective knowledge, and objective knowledge can be dressed with arbitrariness to match subjective knowledge.

The attitude of the paper towards existing science is the standard attitude of epistemology since its emergence in the late XIX century. While in terms of Kant’s critical philosophy nobody could avoid the examination at the tribunal of reason, the post-Kantian philosophers and the modern state excepted science from critics coming from outside their ranks (see [Beiser, F. C. (2014). *After Hegel: German Philosophy, 1840-1900*. Princeton University Press]). This attitude leads to accepting as knowledge of nature theories that have been constructed under confessed instrumentalist views such as quantum mechanics, which had only an instrumental concern for knowledge. In his scientific biography of Dirac, Kragh explains: “By and large, Dirac shared the positivist and instrumentalist attitude of the Copenhagen-Göttingen camp, including its belief that quantum mechanics is devoid of ontological content. He thought that the value of quantum mechanics lay solely in supplying a consistent mathematical scheme that would al- low physicists to calculate measurable quantities. This, he claimed, is what physics is about; apart from this, the discip.line has no meaning.” [p. 80, Helge S Kragh. Dirac: A Scientific Biography. Cambridge University Press, 1990].

The instrumentalist approach is part of Utilitarianism and sacrifices Truth to reach faster Utility. In so doing, it accepts incorrect hypotheses as much as they are useful. In the end, it gets formulae and theories useful in orienting them in their goal of manipulating nature. Such theories are often prone to paradoxes. For example, one root of the measurement collapse paradox in quantum physics is the unwarranted hypothesis of elementary particles being point-like. It was challenged by Schrödinger, who pointed out that by introducing such a hypothesis one is forced into a statistical interpretation of formulae [Erwin Schrödinger. In Michel Bitbol, editor, The Interpretation of Quantum Mechanics. Ox-Qow Press, 1995]. It went unnoticed a second wild hypothesis in Quantum Mechanics: while it is possible to isolate an atom (or any other QM system) from our influence, it is not possible to instruct the atom not to influence the surrounding world. The effects of these two mistakes have to be patched, and this is what interpretations attempt in various ways. [See Solari-Natiello, Rational empiricism... cited above]

Not happy enough with granting Truth-value to what only attempted to have Utility-value, the author offers us the frame of "info-computational models" (one more coined expression in a paper that obscures matters with them). After digging in the references, we learn that it refers to the attempts, by scholars in the Artificial Intelligence paradigm, to assimilate AI with human thinking, a task that is possible when the human under consideration is the (dehumanized) mass-man since the most basic constitutive tool of human beings (and allegedly of developed animals), reason, is downgraded to its mechanistic component: logic. Old and well-seasoned arguments such as those in [Peirce C. S. (1887). Logical machines] still apply despite the incredible progress of machines. The problem is that those authors who believe that AI is in correspondence with human understanding must admit in the first place that it is in correspondence with their own understanding. We can then consider these authors biological-computers. Computers are programmed, and biological-computers are programmed by instruction and guidance (training) during many years. At this point, we can recall W von Humboldt [The Sphere and Duties of Government (the Limits of State Action. 1792] : 'Whatever does not spring from a man's free choice, or is only the result of instruction and guidance, does not enter into his very being, but remains alien to his true nature; he does not perform it with truly human energies, but merely with mechanical exactness.... we admire what he does, but despise what he is.'

In section 4, we learn that the author believes "Relativity theory and quantum mechanics made observer-dependence unavoidable". However, both theories are confessedly utilitarian; they resign understanding in the first place. Einstein presents his utilitarianism in [A. Einstein Physics and reality]. We are then confronted with the paradox of believing that two theories that renounce True knowledge oblige us to

grant the character of Truth to the “observer-dependence” of knowledge. This is, first, knowledge is degraded, and next, we are told as a result of this degraded knowledge that no better can be achieved.

This work would benefit from a deeper elaboration.

Declarations

Potential competing interests: No potential competing interests to declare.

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