

## **A REPLY TO PROFESSOR TRUITT**

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Professor Truitt's critical note on my paper appears to be based on a misunderstanding of its structure and purpose. He writes as if I had used the current empirical evidence against the hidden variable explanation of quantum phenomena as a direct argument against the natural or common sense conception of knowledge. If this were the case, in order to invalidate my presentation it would suffice to point out that the empirical evidence has not been unanimous, which is the approach taken by Professor Truitt.

My paper, however, did not attempt to use such evidence directly as an argument against the common sense conception of knowledge. To have done so would have involved falling into the trap, against which I warned in my paper, of confusing philosophy and physics. What I did was to refer to some of the key figures of the history of philosophy in order to show that efforts against the influence and limitations of the common sense standpoint are rather common place in philosophy, although not necessarily always consciously so, and that what Shimony interprets as a dilemma, as a dead-end, in fact serves as a beginning. If attempts to provide a philosophical explanation, based exclusively on the common sense standpoint, of the principles of intelligibility involved in physics end up in perplexities, while attempts which try to go beyond the common sense standpoint show more promise, so much the worse for the common sense standpoint as the exclusive basis for philosophical reflection.

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*Diálogos*, 49 (1987) pp. 131-133.



Moreover, in my paper I was careful to point out that the empirical evidence has not been unanimous, and I even mentioned (p. 90) the possibility that in the future the dualism between particle and wave (and by extension the present standard interpretation of quantum mechanics which depends on noncommuting operators) may be surpassed by physics. It is not possible to predict what modifications of our way of considering empirical phenomena may be introduced by physics in the future, although philosophy must take into consideration the possibility of change. On the other hand, as far as the present situation is concerned, I did claim that current empirical evidence tends to favor the standard interpretation and has tended to rule out the possibility of hidden variable interpretations, a claim also found in Shimony (in fact this claim forms the basis for Shimony's presentation). Nothing has happened lately which significantly alters this claim. For an assessment of the empirical evidence that goes beyond the sources mentioned in my paper, consider A.A. Grib (*Sov. Phys. Usp.* 27, April 1984) and J.J.J. Kokkedee (*Delft. Progr. Rep.* 9, July 1984). Of interest also are the replies to the critiques of the interpretations of experiments which have been carried out; for example, consider Horne *et al.* (*Phys. Rev. Lett.* 53, Sept. 1984).

The debate concerning the completeness of the standard interpretation of quantum mechanics continues, although the great majority of physicists, backed up by the best presently available empirical evidence, continue to accept the Copenhagen or standard interpretation as the best presently available description of quantum phenomena. Professor Truitt appears to be among those who cannot accept the standard interpretation and, from what he has said in his note, it seems that his hesitancy is based on general philosophical grounds. If this is the case, it is unfortunate, because it would be an indication that he had fallen into the trap of confusing philosophy and physics.

Physics and philosophy complement each other; in order to obtain an understanding of reality we must appeal to both endeavors. But the starting point of their cooperation is the recognition of their difference. Both attempts to ground philosophy directly on experience, without taking into consideration the requirements of reflection, and attempts to do physics based primarily on the requirements of philosophical reflection, without some form of direct appeal to empirical evidence, necessarily end in failure. What physics provides for philosophy is the best presently available description, grounded on empirical evidence, of the physical-mathematical laws that



govern reality; the task for philosophy in relation to physics is to try to explain how the methodology and results of physics fit within a general conception of intelligibility. To confuse philosophical reflection with physics and/or to attempt to transpose physics directly into philosophy does a disservice to both endeavors. Professor Truitt does not seem to be aware of this danger; he seems insistent on defending materialism, which cannot account for itself, let alone for the scientific endeavor.

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