

## Neither Idealism Nor Materialism: A Reply to Snyder

Avshalom C. Elitzur

*The Weizmann Institute of Science*

Lack of distinction between the formalism of quantum mechanics and its various interpretations leads to some popular misrepresentations. As long as none of the interpretations can present an unambiguous empirical validation, their status remains purely philosophical. These arguments are shown to apply to Snyder's claims. Next it is shown that Snyder's criticism does not address the main points in the argument concerning the physical impact of consciousness. The reply concludes with some reflections on methodology in the search for a physical theory of consciousness.

Any work that tries to do justice to a complex subject is bound to convey an ambivalent tone which can evoke criticism from more than one standpoint. This happened to my discussion of the mind-body problem, against which Dr. Snyder (1991) voices objections from two different perspectives. I welcome this challenge to make my thesis clearer.

Snyder advocates the idealist (or mentalist, or dualist) interpretation of quantum mechanics, originally proposed by Wigner (1961/1983). The term "interpretation" is of crucial importance here: it denotes a view that does not directly follow from the formalism (i.e., the physical laws governing observable phenomena). Indeed, Wigner's interpretation, so popular in non-physical works, has never gained a major status in quantum mechanics, which gave rise also to other, mutually exclusive interpretations. For example, every observation is consistent with Everett's (1957/1983) "many worlds interpretation" of quantum mechanics, according to which the universe splits into endless universes at every moment, together with everyone of us! As long as all these interpretations predict the same experimental results, quantum mechanics puts up with all of them with equal patience.

Snyder's favorite explanation, then, says that a cat subjected to Schrödinger's experiment is in a dead/alive superposition as long as nobody observes him

or her.<sup>1</sup> It is, so goes the argument, the observer's *consciousness* that forces the cat to be definitely alive or dead. No one so far was able to propose how this theory can be tested, since, even if we could find someone without consciousness and ask him or her to observe the cat, that person will be in a superposition until asked what he or she saw!

Now, it is one of the wisest insights that philosophy of science has ever produced, due to Popper (1962), that an hypothesis is scientific only if it is in principle *falsifiable*. Clearly, idealism does not meet this criterion. Yet Snyder asserts that any observation *validates* this interpretation: "In that the prediction is verified for all human observers, the theory is the more valid. Because all physicists are conscious, . . . they can thus contribute to the validation of the theory" (1991, p. 298). If we thus dispense with Popper, we will have to give serious consideration to "theories" of the following kind: all coins are superposed (i.e., in the heads/tails state) as long as nobody looks at them; only human gaze forces them to be either heads or tails. Does every look at a coin really validate this theory?

I failed to see how Snyder's variants of Schrödinger's experiment add anything essential to the paradox. As he pointed out earlier (1989, p. 169), repeating Schrödinger's experiment with its extension many times with Option 1 alone or Option 2 alone would leave the statistical pattern of cats found dead and cats found alive unaffected. So, it is only the interpretation of these results – more specifically, the interpretation favored by Snyder – that gives them their alleged significance. No other proponent of idealism, to the best of my knowledge, ever came up with a more rigorous support than a reinterpretation of commonly-expected results.

There are some bizarre consequences of the idealist interpretation that its proponents do not always make explicit. For example, myriads of quantum-mechanical interactions occur in the universe, with the overwhelming majority of them taking place where there are no conscious beings. They often constitute Schrödinger cats in that a quantum-mechanical initial condition is amplified to a macroscopic process. If such a system remains in a superposition until a conscious being observes it, as idealism argues, superposition must also be the fate of any system that interacts with it, and thus will soon be the fate of the entire planet, the entire galaxy and so on until the huge superposed system interacts with a conscious observer somewhere. So, do we determine the state of the galaxies every time we look up? This proposition will not solve the problem yet, since by far most of the universe's history took place before any conscious being existed. Moreover, the big bang itself seems to have had a quantum mechanical character. So, has the entire universe

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<sup>1</sup>Perhaps I should write "it," but as a passionate pet owner this is my way of protesting against idealists' unwillingness to grant cats any consciousness.

been in a superposition until conscious life evolved (within it!) to observe it? Such a fantastic loop has been invoked by a theory called "the strong anthropic principle" (Barrow and Tipler, 1986) which, not surprisingly, has been often ridiculed. The trouble is that any idealist interpretation of quantum mechanics, if consistent, seems to lead to anthropic accounts of the universe. Again, any human perception can be viewed as a validation of this theory, so it is impossible to argue with it, but this is what makes it unscientific. Highly clear and readable expositions of this issue, free of metaphysical bias, are given by Squires (1986) and Rae (1986).

Snyder ventures to speculate that the first and second laws of thermodynamics also have an arbitrary, hence subjective, component. Rather than entering here into a tedious discussion of thermodynamics, let me concede to this speculation: perhaps conservation of energy and the measure of entropy are based on subjective criteria. Equally, however, such a subjective ingredient can be ascribed to Newtonian mechanics, to relativity theory and to the entire gamut of physical laws. In fact, Snyder's earlier articles seem to strive at this very goal, as reflected in his recent statement, "Exact measurements in classical physics, and in a modified sense in quantum mechanics, in principle require an abstraction, a cognitive act" (1990, p. 9). So, even without taking quantum mechanics into account, the physical world is claimed to be determined by our observations. In such a world, the mind-body problem will not be resolved but merely reversed: Why are there physical laws in a world determined by mind? This was lucidly put long ago by the patriarch of idealism himself:

When in broad daylight I open my eyes, it is not in my power to choose whether I shall see or not, or to determine what particular objects shall present themselves to my view; and so likewise as to the hearing and other senses, the ideas imprinted on them are not creatures of my will. (Bishop Berkeley, *Principles*, 1710/1988, p. 63).

Quite rightly, Snyder characterizes my general tone as being "very conservative" and complains that I "did not question the validity of the great majority of physical theory" (1991, p. 300). However, nothing in his arguments provides a sound motivation for doing so. A single falsifiable prediction, amenable to experimental test, would suffice to convince people to look for better alternatives to conservative physics and, if the prediction is verified, to overthrow the former as was done more than once before. So far, none of the idealist expositions of quantum mechanics that recently abound, however impressive their presentation often is, has met this basic criterion. Parapsychology, of course, could provide the desired experiment, as indicated by the many quantum-mechanical models involving psychokinesis, had parapsychology yielded replicable results. So far, it has not.

But a curious exchange of positions occurs when Snyder addresses my main

thesis, in which I *did* question physical principles. My defense of materialism was aimed at showing that an opposing argument can eventually be derived from materialism itself. The very confusion expressed by human beings about consciousness – an observable behavior in the materialistic framework – seems to indicate that consciousness affects the physical world. Against this Snyder switches to a conservative position: he points out that a computer can be programmed so as to express a similar sort of bewilderment. But this very argument was anticipated in my article – in fact, it occupied its lengthiest section (“Consciousness and Artificial Intelligence”). Let me only briefly reiterate its main point. The analogy to computers in this respect, if taken seriously, forcibly leads to the prediction that our brain contains some neurophysiologically recognizable structure (“program”) that causes us to express bewilderment about consciousness. This expectation, however awkward, provides, perhaps for the first time, a *falsifiable* prediction that can distinguish between materialism and alternative views. The burden of proof now rests on materialistic neurophysiology. None of these counter-arguments to the computer analogy is addressed by Snyder, so it is pointless to continue arguing about the issue.

Snyder’s methodological approach should be noticed:

In looking at how cognition and consciousness might influence the physical world, the initial exploration should not be so much directed to finding the change in the principles governing the physical world resulting from the discovery of a psychological influence. Rather, it should be in exploring whether the processes of the physical world themselves have a significant cognitive component. (1991, p. 301)

Interestingly, Snyder (1986) offered some years ago an experiment – the only exception I know to the unfalsifiability of idealistic models – which is possible in principle and can distinguish between human free choice and a “choice” made by a computer. My bet is that the result he predicts will not show up, but Snyder should be complimented for not always being committed to his stated devaluation of experimental tests.

In conclusion, if I may briefly state the problem under discussion and the difference between my approach and Snyder’s, I will put it this way. Our parents, namely, psychology and physics, do not get along well, especially when the subject of consciousness is brought up: psychology is often faced with the presumed existence of consciousness while physics sees no observable evidence for it. The aspiration for a satisfactory physical theory of mind is not motivated only by the desire for a household remedy; it is guided by the feeling that a successful unification of this kind will revolutionize also our understanding of physical reality. Here the ways split. I look for cases in which the existence of consciousness makes an observable difference, while Snyder prefers the elaboration and reinterpretation of the physical laws so

that consciousness fits in with them. Which way to take is a matter of personal taste – but not only that. Look at current issues of physical journals, where some new experimental predictions are creating so much excitement; read the simple and clear account of Leggett (1986) about his proposed SQUID experiment, or Mermin's (1990) exposition of the new variant of the EPR gedanken-experiment. Would quantum mechanics be such a lively and restless theory had it not appealed, beyond the Copenhagen mist, to the impartial, ultimate verdict of the pointer?

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