

Absolute Present, Zen and Schrödinger's One Mind

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1. The principle of objectivation

Perhaps you can cast your mind back to your first encounter with the scientific method at school. It may have proceeded something like the following: In the midst of a small group of students a candle is placed and you are asked to light it up. Thereafter you are required to record a series of observations, for example, what is the temperature in the orange part of the flame, the blue part of the flame, or of the wax. At different times you are asked to measure the height of the candle, and record any changes in the colour or consistency of the wax. In this, or other ways, we come to learn that science involves making observations about some phenomenon, and these observations are input into a scientific understanding of that phenomenon.

It is usually not told, however, what the underlying assumptions are. These are taken as given. First, there is the assumption that the phenomenon is an "object". By this it is meant that the candle has clearly defined boundaries which allows us to isolate and distinguish the candle from non-candle phenomena. In addition, that the candle *is* undoubtedly an object can be seen in the instructions given to the students such as "the object under investigation" etc. An object is assumed to have properties, the values of which can be established by "observation", that is making a measurement of one of the properties, e.g., a particular value of temperature, or a particular colour of the flame. It is also assumed that the properties are independent of each other, for example, by measuring the height of the candle, we don't affect the colour of the wax. Another assumption is that the object persists through time, for example, at different instants we can make record the height of the candle. At each such instant of measurement, there is no doubt that it is the same candle that is being observed and measured.

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Usually nothing much is said about the observer. We are simply told to observe the candle, but who or what the observer is remains unknown and somewhat irrelevant to the process. We are told that the observations are “independent of the observer”, not much more than that. By observing the candle, we come to tacitly understand that we can peek at the object from the shadows so to speak - as our observations do not influence the object. Finally, we assume that even when we are not observing the candle, it still exists as an object external to ourselves as observers.

Erwin Schrödinger, one of the founders of quantum theory described the principle underlying our candle scenario as “objectivation”. By this he meant,

.. the thing that is also frequently called the hypothesis of the real world around us. I maintain that it amounts to a certain simplification which we adopt in order to master the infinitely intricate problem of nature. Without being aware of it and without being rigorously systematic about it, we exclude the Subject-of-cognizance from the domain of nature that we endeavour to understand. We step with our own person back into the part of an onlooker who does not belong to the world, which by this very procedure becomes an objective world.

This fragment is quoted from an essay (Schrödinger, 1992b, p. 118) the goal of which was to elucidate two general principles underlying the scientific method, the “principle of objectivation” being one of the two.

This quote is striking in a number of ways as it seems to contradict some of the assumptions listed above in relation to our observation of the candle. Firstly, the term “hypothesis” is explicitly mentioned in relation to the “real world”. As students of science, we are not usually led to hypothesise whether the world around us is real, but as stated above, we simply accept that the candle exists in a reality external to ourselves. Secondly, even though we are taught to be systematic and rigorous when conducting our observations, Schrödinger points out that we are not systematic or rigorous about something else, namely what he calls the “Subject-of-cognizance”. At this point we won’t go into detail about what the Subject-of-cognizance might be, but simply point out that by assuming the role of the observer of the candle, something of seeming significance is being excluded, and that exclusion is done *without awareness* that something is being excluded. Finally, he states something very extraordinary: By our stepping back “as an onlooker”, the world becomes “objective

2. Enter the Subject-of-cognizance

It would be mistaken to think that Schrödinger’s essay was a criticism of the scientific method. Rather, he was trying to clarify the scientific method in the context of western science and psychology in the early nineteen forties. Schrödinger states the Subject-of-cognizance as being

excluded in the principle of objectivation. By bringing it back in, the philosophical problem of the subject- object relation trails in its wake. There is a relevant historical context in which to consider this age-old problem. While quantum theory was being developed, it seemed that new insights into the subject-object relation may be achieved. The reason for this is that in experiments made on quantum particles, choices made by the observer had a pronounced effect on the quantum-object being observed. It seemed no longer case that the observer (the subject) could peek at the object while residing in the background. For example, Jammer (1974, p. 161) states that Pascal Jordan emphatically stated the very act of observation was *creating* the object being observed. In addition, Jordan seems to have at least considered subjectivism, “we ourselves produce the results of measurement” [Wir selber rufen die Tatbestände hervor] (Jordan, 1934, p. 228). Despite some of the founders of quantum theory leaning toward subjectivism, it made many physicists, both then and now, decidedly uncomfortable. In the mean-time it has been well documented how the field of quantum physics circumvented subjectivism by means of the Copenhagen interpretation (e.g., see (Rosenblum & Kuttner, 2006)).¹

Schrödinger’s position in regard to the subject-object relation was not a circumvention, but radically to the point. At the very end of his essay he states (Schrödinger, 1992b, p. 127): All this was said from the point of view that we accept the time-hallowed distinction between subject and object. Though we have to accept it in everyday life “for practical reference”, we ought, so I believe to abandon it in philosophical thought... *The world is given to me only once, not one existing and one perceived. Subject and object are only one. The barrier between them cannot be said to have broken down as a result of recent experience in the physical sciences, for this barrier does not exist* [emphasis added].

Schrödinger’s mention of “recent experience in the physical sciences” alludes to the previously mentioned reconsideration of the problem of the subject-object relation raised by quantum physics. Schrödinger’s stance is very unorthodox in two respects: (1) there is *no duality* between subject and object (the orthodox position is that there is an inherent distinction) and (2) the only world that is “given” is the one that is actually being perceived. This runs counter to the orthodox view that the world exists independent of our perception of it.

¹ Chalmers & McQueen (2014) have recently argued in support of consciousness playing a causal role in collapsing the wave function. They posit the existence of m-properties which can never be superposed. Whenever a superposed property becomes (potentially) entangled with an m-property it necessarily collapses into a definite state. Consciousness is a natural candidate for an m-property since it cannot be superposed; for example, I cannot experience red and not-red simultaneously in the same location. This hypothesis has the theoretical virtues of: (1) providing a potential solution to the measurement problem, in particular, an explanation for why measurement collapses the wave function into a definite state, and (2) gives consciousness a causal role in the physical world. Schrödinger goes further than Chalmers and McQueen’s dualist theory by holding that the physical world is in fact constituted by conscious experience

3. Zen and one mind subjectivism

A perception sudden as blinking, that subject and object are one, will lead to a deeply mysterious wordless understanding; and by this understanding you will awake to the truth of Zen

This is a quote from Huang Po (d 850) a well-known master from the Chinese period of Zen known as Chan (Blofeld, 1958). The essence of Huang Po's quote is the same as Schrödinger's, namely that subject and object are one in a spontaneous act of perception. Moreover, Chan teaches that this perception is a discontinuity in the sense that it is not simply revealing a pre-existing non-dualistic form of reality. More specifically similar to Huang Po's "perception sudden as blinking", Schrödinger wrote in a letter to Bruno Bertotti, one of his students (Bertotti, 1985):

... the very, very old Indian TAT TWAM ASI (This art thou) [subject-object are one] is, of course, not a physical but rather a metaphysical statement. It is so simple that it is impossible to explain it. It cannot be grasped by the intellect, *but it may spring up in you at some occasion like a spark*, and then it is there and will never really leave you, even though it is not a practical maxim to use every hour of your life. [emphasis added]

In the history of Zen there are many stories of such spontaneous experiences. They are often expressed in relation to perception via a particular sense modality, for example, the sense of sound.

Monk: Where can I enter Zen?

Master Gensha: Can you hear the babbling brook?

Monk: Yes, I can hear it.

Master Gensha: Then enter it there.

The oneness of subject and object is a holistic experience of there being no distinction between that which is hearing (subject), the act of hearing, and that which is heard (the object). Such experiences directly undermine the distinction and assumed separation between an observer (subject) perceiving a candle (object).

If subject and object are one, what then is doing the observing? This is a very important question in Zen. It is common to assume the subject, the one doing the observing, is a product of consciousness in an individual's brain, and it would therefore be understandable to define Schrödinger's Subject-of-cognizance in this way. However, he himself did not adhere to such a definition. Schrödinger rejected this theory for two reasons. Firstly, because "the stuff from which our world picture is built, is yielded exclusively from the sense organs as organs of the mind, so that every man's world picture is and always remains a construct of his mind and cannot be proved to

have any other existence.” (Schrödinger, 1992a, p. 122). Unsurprisingly then, the mind itself cannot be found within this construct. He points out secondly, that no one has ever observed consciousness in the head or body. The scientist rather finds only “millions of cells of very specialized build in an arrangement that is unsurveyably intricate” (ibid., p. 123). He goes on “nowhere you may be sure, however, far physiology advances, will you ever meet the personality, will you ever meet the dire pain, the bewildered worry within this soul.” (ibid., p. 124). In summary, we cannot find mind in the world because our world picture is constructed by the mind. Moreover, “The reason why our sentient, percipient and thinking ego is met nowhere within our scientific world picture can easily be indicated in seven words: because it is itself that world picture. It is identical with the whole and therefore cannot be contained in it as a part of it.” (Schrödinger, 1992a, p. 128). The mind is thus the container of the world picture, not something within that picture (ibid., p. 136-137).

We have seen examples of Schrödinger’s philosophical method, which is in the spirit of ‘radical empiricism’ as employed by William James (James, 1976). Based upon experience he rejected the separability of subject and object, and hence the hypothesis of an independent world. This method, combined with philosophical arguments further lead him accept the conclusion that rather than many consciousnesses, there was in fact only One Mind, and hence one observer. In fact, Schrödinger stated in the 1950’s that his world view was formed by Spinoza and Schopenhauer. In particular, the view that he formed when he was thirty-years old, and never changed, was that of the One Mind presented in the Upanishads (Bitbol, 1999).

Bruno Bertotti was one of Schrödinger’s students and was clearly intimate with his views (Bertotti, 1985). Bertotti defined of Schrödinger’s world view as “rational mysticism” and summarized it as follows: “his main philosophical theme, namely that all existents, in particular the individual consciousnesses, are manifestations of a Single Mind”.

Why did he hold this view? In another essay, Schrödinger refers to inevitable paradoxes that spring from a single source which he termed the “arithmetic paradox” (Schrödinger, 1992a). He defines this paradox as “The many conscious egos from whose mental experiences the one world is concocted”. More specifically (Bertotti, 1985), the most wide-spread attitude is, so I believe, the following:

there is one real world and this naturally accounts for its making the same impression on Mr. A, Mr. B, etc., etc .. to me it seems the greatest and absolutely inexplicable marvel that “we all live in the same world”... Why marvel? Well, you see, my world is built up of my sensations, the world of Mr B is built up of Mr B’s sensations. There is absolutely no communication between Mr B’s sensations and mine. . . Is it not then actually an unaccountable marvel that these “two worlds”, built as it were from entirely different material, coincide?

It is apparent from the preceding that Schrödinger did not subscribe to the common sense view that the correspondence between the sensations of Mr. A and Mr. B. is due to them both

perceiving the same external reality. He rejected this doubling of the world into appearance and reality, and any empirically suspect notions such as Kant's thing-in-itself (Schrödinger, 1992a, p. 127), hence this solution was unacceptable to him. He also rejected Leibniz's "fearful doctrine of monads" (ibid., p. 129). Although Leibniz's view avoided mysterious things in themselves and did not make the error of locating consciousness in things, it entailed a splintering of the universe into numerous non-interacting worlds.

Schrödinger's resolution of the arithmetic paradox once again involved adopting a radically unorthodox position (ibid):

There is obviously only one alternative [to the paradox], namely the unification of minds, or consciousnesses. Their multiplicity is only apparent, in truth there is only one mind. This is the doctrine of the Upanishads. And not only of the Upanishads. The mystically experienced union with God regularly entails this attitude.

Schrödinger's view is there is only "one mind", not individual consciousnesses. Therefore, the only possible observer is this One Mind. Finally, Schrödinger, again employing a method of radical empiricism argued:

The doctrine of identity (of all minds) can claim that it is clinched by the empirical fact that consciousness is never experienced in the plural, only in the singular. Not only has none of us ever experienced more than one consciousness, but there is also no trace of circumstantial evidence of this ever happening anywhere in the world. (ibid, p. 130)

This observation does not logically entail his conclusion since an absence of evidence of multiple consciousnesses is not the same as evidence of absence of multiple consciousnesses. Nevertheless, as an empirical argument, no evidence for something (for example unicorns, Homeric gods etc.) provides a reason for not believing in that thing. Furthermore, the phenomenology was not meant to stand alone, but to work in conjunction with his other philosophical and empirical arguments. Did Schrödinger ever attempt to incorporate his world view based on the One Mind into his scientific theories? Bertotti was unable to uncover any tangible attempt, however in Bertotti's description of Schrödinger's vision, he does allude to the possibility of there being one (Bertotti, 1985):

On the one hand the essential unity of the world arises from its fragmentation among the individual consciousnesses not because of a cogent philosophical argument, but through a 'mystical' awareness; on the other hand this very 'oneness', being independent from the single observers, makes quantum mechanics unacceptable and *urgently requires a new theory*. [emphasis added]

The question left dangling is whether a scientific theory could be developed around the One

Mind. Such a question would seemingly need to bridge Eastern philosophy and the realism of contemporary science. The rest of this chapter will not attempt to present such a bridge, but rather focus on the concept of time - a concept which is core to both sides of the bridge.

4. Subject, object, time, NOW

Let us go back to the scenario of observing the candle. Recall that one of the tacit assumptions was that the object (the candle) persists through time and the observer can make observations at various time instants. Regardless of having “stepped back as an onlooker”, it is reasonable to assume that the observing subject similarly persists through time as illustrated by Figure 1.

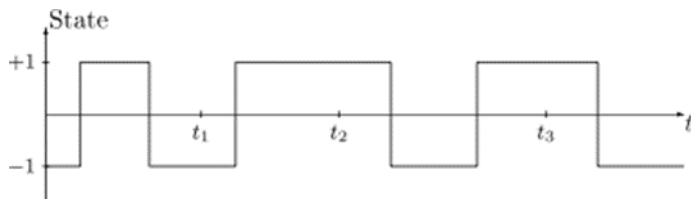


Figure 1: The state of awareness of an observing subject

This diagram represents two states of the observer, where, for example, +1 represents the observer is in the state attending to the candle and -1 represents a state in which the observer has become distracted. In this way the state of the observing subject can be modelled as having a linear temporal trajectory through a space of two possible states. As mentioned in the introduction, a feature of this time-based mode of observation is a seeming separation between observer (subject) and observed (object), which both Huang Po and Schrödinger deny. Contrast this time-based account with Huang Po's “a perception sudden as blinking that subject and object are one”, which suggests the experience of One Mind is a discontinuity. This notion of discontinuity also accords with Schrödinger's observation mentioned earlier “...it [one mind awareness] may spring up in you at some occasion like a spark”. But does such a state of One Mind persist through time?

In his philosophical exploration of time Schrödinger (1992c) inquires into whether science and philosophy can illuminate religious beliefs about life and death and the transcendence of time. He approvingly interprets Kant as having proposed that:

To be spread out in space and to happen in a well-defined temporal order of ‘before and after’ is not a quality of the world that we perceive, but pertains to the perceiving mind which, in its present situation anyhow, cannot help registering anything that is offered to it according to these two card-indexes, space and time. (p. 144)

Schrödinger again poses doubt as to whether space and time are qualities of an objective world. He asks, even if we do accept the hypothesis of an objective world, on what basis are we to decide whether an experienced feature belongs to our mind or the world (ibid, p. 145-146)? This being said, the most insightful point to take away from Kant, according to Schrödinger, comes from Schopenhauer's reading of Kant:

The great thing was to form the idea that this one thing 'mind or world' may well be capable of other forms of appearance that we cannot grasp and that do not imply the notions of space and time. This means an imposing liberation from our inveterate prejudice. There are probably other orders of appearance than the space-time like. (ibid., p.146)

What would an experience beyond space and time even be like, and how does it apply specially to One Mind awareness? Once again Schrödinger answers this question from direct experience:

Mind is by its very nature a *singular tantum*. I should say: the over-all number of minds is just one. I venture to call it indestructible since it has a peculiar time-table, namely mind is always *now*. There is really no before and after for mind. There is only a now that includes memories and expectations (Schrödinger, 1992a, p. 135).

The state of One Mind, then, according to Schrödinger, is experienced as a kind of timeless NOW. He denies that 'before' and 'after' apply to the experience of the present moment. Rather 'before' and 'after' are constructed in the timeless NOW by memory and expectation.

Schrödinger's phenomenological descriptions of this timeless present moment are echoed in spiritual traditions, with a particular affinity with Zen Buddhism, as is evident from D. T. Suzuki's summary of Zen:

Zen is emphatically a matter of personal experience; if anything can be called radically empirical it is Zen. No amount of reading, no amount of teaching, no amount of contemplation will ever make one a Zen master. Life itself must be grasped in the midst of its flow; to stop it for examination and analysis is to kill it, leaving its cold corpse to be embraced. (Suzuki, 1954, p. 132)

Dōgen, a 12th century Zen master, provides descriptions of temporal experience that are particularly relevant to those of Schrödinger. Dōgen² (1200-1253) was one of the most prolific writers amongst Zen masters of old and contributed an extensive collection of articles on various topics (Tanahashi, 2010a,b). The chapter of relevance to the present discussion is titled "The time being" (sometimes translated as "Being time" (Dōgen, 2010).

The time being has a characteristic of flowing. So-called today flows into tomorrow, today flows

² Zen master Dōgen was the founder of the Soto sect, one of the two main schools of Zen Buddhism in Japan.

into yesterday, yesterday flows into today. And today flows into today, tomorrow flows into tomorrow. Because flowing is a characteristic of time, *moments of past and present do not overlap or line up side by side* [emphasis added]

This position aligns with Schrödinger's because it denies a linear succession of time instants. In the following passage, Dōgen also alludes to the subject-object mode of awareness as being connected to the orthodox linear notion of time:

In your study of flowing, if you imagine the objective to be outside yourself and that you flow and move through hundreds of thousands of worlds, for hundreds, thousands and myriad of eons, you have not devotedly studied the buddha way.

Here Dōgen implies that it is illusory to assume an objective universe through which an individual moves through space and time. The striking element here is that the objective universe seems so ordinarily real, so real that it doesn't bear questioning. In Zen, however, the objective universe is viewed as an almost perfect illusion where "devotedly studying the buddha way" involves earnestly questioning the assumed reality of the objective universe to directly understanding the reality of this illusion. This understanding is not a conventional understanding, but rather, as Huang Po states "a wordless understanding", which is brought about by experiencing One Mind awareness. Such a radically subjective understanding of space and time as found in Zen is again reflected in Schrödinger's writings when he says about the conscious mind that:

It is the stage, and the only stage on which this whole world process takes place, or the vessel or container that contains it all and outside which there is nothing. (Schrödinger, 1992b, p. 136).

There is one philosopher who is uniquely positioned to bridge Dōgen's view of time and Schrödinger's view of One Mind. His name is Nishida Kitarō. Nishida trained in Zen Buddhism and according to D.T. Suzuki, an authoritative Zen scholar, Nishida had an enlightenment experience which deeply influenced his views about the ultimate nature of reality. In the context of this article, Nishida's experience can be construed as a direct experience of Schrödinger's One Mind. Rather than write from a spiritual perspective like the ancient Zen masters, Nishida was determined to write about the essence of reality in a way that would be acceptable to the contemporary philosophy. With this choice, Nishida was unknowingly subscribing to Schrödinger's rational mysticism in the sense that his philosophy presents itself as a rationalism that proposes to analyze reality which has been grasped on the basis of a profound religious, or spiritual experience.

Whilst Nishida does not use the term One Mind, he does directly refer to it in terms of the self as a borderless "absolute present". He states (Raud, 2004),

When I speak of ourselves being singular focal points of the world determining our individualities through self expression, this does not mean that I conceive of the self necessarily in terms of the logic of objects. It is rather, a singular centre of the absolute present that includes in itself the eternal past and future. This is why I call the self a momentary self determination of the absolute present ... And the world of the absolute present is the sphere with infinite radius and no circumference, which has a center everywhere.

Nishida's view refers to the 'logic of objects'. By this he meant something very similar to the Schrödinger's principle of objectivation, namely that the logic of objects occurs when the subject steps back as an observer thus rendering a universe of objects. Moreover, Nishida's 'absolute present' resonates with Schrödinger's notion of the timeless NOW, but in Nishida's view, this 'absolute present'³ also includes both future and past. This view clearly aligns with Dōgen's, "today flows into tomorrow, today flows into yesterday, yesterday flows into today...".

In contrast to the 'logic of objects', Nishida proposed the 'logic of absolutely contradictory self-identity'. This logic is the foundation of Nishida's philosophy, which was deeply influenced by his practice of Zen (Kozyra, 2018). Kozyra (2018, p. 432) describes Nishida's logic as when "the subject transcends itself and perceives the object 'through becoming the object'. We perceive the world in our absolutely contradictory self-identity with the world". This definition clearly has the same essence as Schrödinger's One Mind in which subject and object are one.

Nishida's term 'absolute present' may seem like a term which is time-based, but Nishida's quote above also importantly refers to space, which he describes as boundless and without a center.³ (Raud, 2004, p 44.) interprets the "center" as equating to an individual subject or 'conscious self'. He further argues that the dichotomy of space and time obtains from the standpoint of such a self. This dichotomy is transcended when these time and space unite in 'contradictorily self-indexical' point of view. Raud stresses that the unification should not be posited as being outside the context of reality, because when the self determines itself to be the 'absolute present', then the self is none other than reality itself. This reality paradoxically manifests a borderless space in which seemingly distinct phenomena have no separation and is a timeless NOW which includes time. It is at the 'absolute present', Schrödinger, Dōgen and Nishida converge.

5. Closing Reflections: The Illusion of Time's Arrow

Here we have investigated Schrödinger's views on subject-object non-duality and the One Mind hypothesis. We also showed how he questioned subject-object duality by denying that an

³ Nishida also uses the expression 'eternal now' elsewhere in his writing.

observation is the relation of the objective time of an object and the separate subjective states of an observer. For Schrödinger space and time, if they are anywhere at all, belong to the observer-observed unity (not outside of it). Schrödinger also sought for a liberation from time through philosophy and mystical modes of experience, particularly in the timeless NOW. As a scientist, however, he was not content with these philosophical and mystical approaches by themselves. His thinking was also constrained by the findings of the sciences. We would like to close by asking: how do his reflections on time accord with physics?

In fact, Schrödinger believed that the non-objectivity of time is also supported by physics. In his thoughts on science and religion (Schrödinger, 1992c), he grappled with the enduring mystery of the arrow of time. The problem is that for observers, time seems to flow uniformly in a single direction from past to future. Yet the laws of mechanics are symmetrical (Schrödinger, 1992c, p. 151). The arrow of time is not fundamental to these laws. As a consequence, there is no reason to believe that the world is not like a film that could be played backwards as well as forwards. To explain this, Schrödinger draws upon Boltzmann's statistical theory of time. Boltzmann demonstrated that the arrow of time could be explained by the second law of thermodynamics that a system tends towards greater entropy. That is, time is not physically fundamental in this view, rather the reason that eggs do not unbreak is not because they cannot, but because it is simply a very unlikely event. For Schrödinger the statistical theory of time's arrow provided further support for Kant's theory that time is subjective. There is however a tension that Schrödinger does not resolve, namely in the formalization of quantum theory, time has both an objective and fundamental treatment.

Interestingly, however, a number of recent studies have experimentally linked the thermodynamic arrow of time to quantum theory. One study showed that a sub-system tends towards equilibrium because of quantum entanglement of its particles with surrounding systems (Linden et al., 2009). This means that a cup of coffee will tend to cool down (reach equilibrium) because of the entanglement of its particles with surrounding air particles. Another study demonstrated that the thermodynamic arrow of time could be reversed when two particles were initially quantum mechanically correlated (Micadei et al., 2017). This shows that the thermodynamic arrow of time is relative to initial conditions, it is not an absolute. The important point of these findings is that time is not a background flow that things happen in, but is reducible to the mechanics of the systems themselves. It is an open question whether time will eventually be eliminated from all fundamental physical theories, including quantum theory. Important steps in this direction have been made by Julian Barbour.

Barbour (1999) assumes that time is a derivable notion based on change. He presents a theory based on a configuration space U , each point of which is a particular configuration of all matter in the universe (called a 'now'). A path between two points is a curve where time is derived from differences between the configurations corresponding to the points on the curve. One of the consequences of Barbour's theory is that it parsimoniously supports a timeless Newtonian dynamics. (Barbour, 2009).

When Schrödinger penned his views about One Mind, his exalted place in the history of science had already been assured. Nevertheless, his unorthodox views on such matters were politely ignored, and even today these views are relatively unknown. In the mean-time quantum theory has become the most stunningly successful theory ever devised by humans. To date, quandaries raised by quantum theory such as subject-object duality remain unresolved. There are some small signs, however, that such foundational issues are being revisited. For example, Malin (2003) has written an intriguing account of the foundations of quantum theory from a western philosophical perspective. What is very striking about this book is its third part titled "Physics and the One". Following from Schrödinger, Malin argues that the next step for science is to transcend subject- object duality. In this regard, Malin issues a thought provoking and daring question: "The quest for the One Mind calls for the transcendence of the subject/object mode. Can science participate in this quest?"

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