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The Two Quests for Consciousness: Integrating Scientific and Mystical Ways of Knowing

CONSCIOUSNESS, SCIENTISM, MYSTICISM

The common ground

Despite the generally prevalent view that science and religious mysticism are incompatible, there are a number of good reasons for recognising their common ground. While *beliefs* associated with these two approaches to knowing may often highlight their differences, it is their *motivation* to understand the nature of mind and ultimate reality that unites them. Beyond this motivational aspect, the key concern is whether *data* from the two approaches may be fruitfully brought into relationship, for arguments over beliefs are largely intractable, while data drive the evolution of our thinking. In fact, data from scientific psychology and mysticism can bring mutual enrichment, informing each other's challenge to understand the mind and our potential for growth towards states of increased well-being and effectiveness.

Central to these challenges are the two quests for consciousness. The first is the endeavour to understand the nature of consciousness and its relation to the structures, most notably the human brain, which are assumed to be involved with it. It is in this sense that eminent neuroscientist Christof Koch entitled one of his books *The Quest for Consciousness* (Koch, 2004), which essentially concerns the search for the ***neural correlates of consciousness***. The term '*correlate'* is used to emphasize that the question of causation is undetermined. In other words, every time (or usually) when event A happens, then event B follows, but if we do not know that A *causes* B, we can then say that there is a *correlation* between A and B. Therefore, neural correlates of consciousness refer to a minimal set of neural mechanisms that are known to accompany, rather than cause, a specific event or state of consciousness.

The second quest is for states that are deemed more fulfilling, or more integrated, than the everyday state of mind. It is this latter quest which has largely been associated with mysticism, since the goal of union with the divine, or some form of Absolute, is viewed as the ultimately fulfilling state of consciousness. Since the nineteenth century, the mystical path has frequently been understood in terms of aspiring to some form of increased or higher consciousness—hence the epithet *quest for consciousness.*

Evelyn Underhill, one of the foremost writers on mysticism, observes that mystical consciousness is superior to normal consciousness inasmuch as the latter "is incapable of apprehending the underlying reality from which … scattered experiences proceed" (Underhill, 1980, p. 30). Similarly, the twentieth-century mystic G. I. Gurdjieff taught that the mundane state of the awake mind is relatively unconscious by comparison with the real consciousness associated with the enlightened state. Without embarking on a path of disciplined practice (referred to as the "Work"), humans are effectively 'asleep,' inhabiting a twilight consciousness; and "the object of the Work is to increase consciousness" (Nicoll, 1956, p. 1526).

Critical to my observations in this chapter is the *complementarity* between these two senses of the term quest. Science is often assumed to be the only route to identifying details of the nature of consciousness, while mysticism is supposed to be the repository of teachings for transformation. But this rigid demarcation cannot be upheld. For example, the recent upsurge of scientific interest in the state of **mindfulness** (where one's complete attention is focused on experiencing the present moment without judgement) is impacting on the ways in which meditation practices are taught. In other words, what may be considered the best way in which to approach the transformation implied by mindfulness is no longer left to the religious teachers and practitioners alone.

On the other side of this seeming demarcation, the purview of mysticism includes analysis of mental processes such as perception, thinking, and memory—all of them central to understanding the nature of consciousness. It is therefore simplistic to consider that the quest to understand the nature of consciousness is reliant on science alone, just

as it is incorrect to assume that science has no role to play in specifying the detail of transformation to higher states associated with mysticism. Given the common ground between science and mysticism, we can further ask whether fresh insights might arise when we endeavour to integrate data and insights from the two areas. This challenge is where my interest lies (Lancaster, e.g. 2004, 2011a, 2013).

Contrary to what may be a common assumption, mysticism is not solely about the quest for experience of the divine or some other formulation of ultimate reality. In the first place, the emphasis on experience hardly appears as a hallmark of the majority of texts which might be classed as mystical. Steven T. Katz, Director of the Elie Wiesel Center for Judaic Studies at Boston University, rightly notes that "the literature produced by the major mystical traditions … is not … primarily about an independent and individual religious experience but is, rather, more often than not, composed of esoteric commentaries on canonical texts" (Katz, 2000, p. 8). Moreover, the undue emphasis on experientialism, the view that only personal experience can form the foundation of knowledge, distorts mystical teachings, encouraging a degree of spiritual narcissism which is hardly conducive of the intended aims (Ferrer, 2002).

Secondly, in cases where experience does come more to the fore, the focus may be concerned as much with cognitive processes as it is with ultimates. A good example of this tendency is the Buddhist **Abhidhamma's** treatment of thought and perceptual processes, which I shall discuss below (for an expanded treatment see Lancaster, 1997, 2004). 'Abhidhamma' means 'higher teaching,' and comprises those writings within Theravada Buddhism that systematize the Buddha's understanding of experienced reality.

On the grounds that Buddhism quintessentially entails inner meditation, Ninian Smart, a former professor of comparative religion, regards it as the "most mystical of religions" (Smart, 2000, p. 232). I would add that the Abhidhamma is mystical to the extent that its analysis of features of mind is predicated on the primacy of the transformational imperative. The student of Abhidhamma is enjoined to study his or her mind not as some kind of abstract interest but precisely to attain

to greater control over mental processes that otherwise operate in habitual fashion.

Mysticism also entails a bi-directional view of the cosmos: from 'higher' to 'lower,' that all things are infused with a presence which transcends our immediate space-time continuum; and from 'lower' to 'higher,' that the primary goal in life is to transcend the space-time continuum. While cultivation of specific kinds of experience is not always a defining feature of mysticism, a readiness to enliven study of teachings by reference to experience of non-ordinary states is never far from the surface. The Hebrew term ***Kabbalah***, used to refer to the mystical strand in Judaism, serves to make this point about mysticism in general. "Kabbalah" derives from a verbal root meaning to 'receive,' which gives two connotations to the Jewish mystical tradition: to receive from a teacher (and the textual sources) and to receive inwardly by way of direct transmission or revelation. Mysticism extols the active search for both.

In addition, Abhidhamma also discusses notions like ***karma***, the universal principle of cause and effect in Buddhist thought, whereby actions have impact on the actor, both throughout the lifetime and in reincarnation. This view obviously does not fit within a **physicalist ontology**, where 'ontology' is the philosophical study of the nature of being and reality, and **physicalism** is the ontological view that there is no reality other than that which is physical. In other words, since karma implies that we somehow survive or continue beyond bodily death, then any system that accepts karma must reject any philosophical position that says reality is limited purely to the physical realm.

An ontological divide?

The above characterization of mysticism, which implicitly recognizes a dimension that transcends the space-time continuum of consensual reality, immediately introduces a conceptual chasm with science. Although, as Spencer (2012) notes, various eminent pioneering physicists have denied physicalism (also called materialism), it is axiomatic that the scientific method can address only those phenomena capable of measurement in physical terms. The general practice of science

works with the ontology of physicalism. Note, however, that this is not to say that science gives a basis for denying that anything transcending physical reality *could* exist; it is simply that if such an entity is incapable of physical measurement, then it is beyond the remit of science. There is no paradox, for example, in the fact that an eminent scientist may be religious: he or she may believe that there is a realm beyond the physical, beyond the reach of science as generally understood.

The view that all things are ultimately explicable in purely physical terms is not a scientific fact; it is a belief that is a concomitant of ***scientism***, the view that the only valid way of knowing is scientific knowing. These notions are extrapolations from the fact that a physicalist paradigm has generally been successful in explaining physical phenomena, with data from scientific research in support. However, when it comes to consciousness, such explanation is lacking. There is no convincing explanation currently available as to how consciousness arises from physical matter; indeed, there is an ***explanatory gap***, which, in this case, refers to the absence of any definitive explanation of how or why consciousness is related to physical events (Levine, 1981, 2003).

As a consequence, there are three tenable positions concerning the metaphysical basis of consciousness (Lancaster, 2004). The first is the default for most working in consciousness studies, namely that the lack of explanation does not detract from the tenet that consciousness is indeed a product of physical activity, it being argued that while there is currently an explanatory gap, given more time, and with advances in instrumentation, science will furnish an explanation. The second position holds that consciousness is an irreducible component of the natural world, and therefore in its essence not generated by physical structures and processes. And the third position is that an essential aspect of consciousness transcends the natural world. The vehemence with which each of these viewpoints is held may be seen in the controversy sparked by a recent book by philosopher Thomas Nagel (*Mind and cosmos: Why the materialist neo-Darwinian conception of nature is almost certainly false*, 2012), in which he argues for the second of the above positions (Chorost, 2013).

A key question here is whether the science of mind, namely psychology, need be concerned about spiritual and mystical beliefs in the transcendent (that which is beyond the range of normal or physical human experience). Again, the contemporary interest in the effects of meditation is a case in point, since, by ignoring the metaphysical context within which meditation has been fostered in most traditions, researchers have generated a highly effective and influential research programme (Lutz, Dunne, and Davidson, 2007; Beauregard and O'Leary, 2007). However, as a complement to this approach, I have argued (Lancaster, 2002) that the branch of psychology most engaged with mysticism, namely transpersonal psychology, should at least be open to the claim that the human belief that a transcendent realm exists is well-grounded (Hick, 2000). The claim is well-grounded inasmuch as (i) a majority of the individuals making the claim are sane and generally to be trusted; (ii) the claims are not substantially contradicted by science (they may be contradicted by scientism, but not by scientific knowledge); and (iii) the claims show a significant coherence across diverse times and place.

To be sure, simply extolling the value of belief in a transcendent realm is the job of religion and not psychology, but it is also important to recognize that the transcendent is not ruled out by any incontrovertible scientific observations. The issue for transpersonal psychology in particular is whether openness to such beliefs makes a difference. The principle of ***Occam's razor*** (which prefers using a minimum number of constructs that account for the facts) would have us jettison notions of ontological transcendence if indeed there were no benefits to be gained, but I think we are indeed missing important benefits. While mindfulness practices in broadly secular contexts can bring psychological and health benefits, it seems to me that there are additional gains when we engage more fully with the spiritual and mystical traditions that developed the practices in the first place. In my experience, people develop greater insight, more profound levels of compassion, and increased harmony when they are open to teachings within these traditions about transcendent levels of being.

In the next section, I offer some examples where insights from mystical traditions can fruitfully be juxtaposed to observations from scientific psychology. The key word here is 'fruitfully,' since merely finding a degree of fit between the two approaches is trivial; my interest lies with those juxtapositions that can induce new thinking in the cognitive neuroscience of consciousness. (This is not to say that an impact in the reverse direction is not equally important —that cognitive neuroscience might change long-held ideas in mysticism; but in this short treatment that will not be my focus.) In many instances, the issues of ontology have no bearing—the emphasis on momentary consciousness in Buddhist thought, for example, may be instructive for a cognitive neuroscience of consciousness without challenging the prevailing worldview in psychological science. But in other cases, the foregoing discussion becomes relevant, and the critical questions concern the ways in which mystical knowledge of the transcendent realm intersects with scientific knowledge of the brain and with psychological models of the process of transformation.

Elements of a generative integration

The Buddhist analysis of mind presented in the Abhidhamma explores in detail the full implications of the fundamental teaching of momentariness (Banerjee, 2008; Cousins, 1981; Ratnayaka, 1981). When it comes to consciousness, the teaching insists that the notion of an enduring continuum of consciousness, an ever-flowing 'stream' of consciousness, is illusory. There are only *moments*, or *pulses*, of consciousness, each of which arises as a conditioned response to a prior moment, endures for a brief period, and decays, having triggered the next pulse. Unless prolonged through contemplative observation, each moment of consciousness is normally extremely brief, so brief, in fact, that the ancient commentators had calculated it to be 1/74,642 second per moment! (Collins, 1982). While there is, no doubt, some hyperbole in such a calculation, it was clearly the intention of the authors to stress the brevity of these moments of consciousness, which seemed to me to give a basis for viewing them as the experiential equivalents of micro-stages in neural processing (Lancaster, 1997, 2004).

This Buddhist perspective on consciousness is strikingly in accord with ideas advanced by neuroscientist Semir Zeki based on his research into the processing carried out by the many regions of the brain devoted to visual functions (Zeki, 2003; Zeki and Bartels, 1999). Zeki argues that the visual system comprises a series of functional nodes, each of which responds to specific aspects of the visual input and has a distinctive conscious correlate. Visual consciousness accordingly comprises 'many microconsciousnesses,' to use Zeki's phrase. The argument that consciousness is effectively disunified clearly corresponds to the Buddhist perspective, with microconsciousnesses paralleling the discrete moments of consciousness portrayed in the Abhidhamma.

One of the major issues in the study of consciousness concerns methodology; research into brain function can at best generate data concerning *correlates* of consciousness, but we can *know* consciousness only from the inside. The ideal must be to integrate introspective insights with the data emerging from externalized study. The convergence of Buddhist inner observation with scientific research provides an exemplary case where the value of this integration becomes apparent. The value of the insights from the Abhidhamma derives from the sophisticated power of observation underlying them. It is only as a result of extensive training through meditation and spiritual discipline that the authors of the classic texts were able to penetrate beyond the delusions of an untrained mind. It is interesting to note that Zeki specifically comments on the level of resistance to his theory, presumably on the grounds that it does not accord with simple introspection. The marriage between scientific study of the brain and the Buddhist tradition of introspection can overcome these problems attributable to scientists' inadequate training in the nuances of consciousness. Central amongst the misperceptions that tend to dominate psychology and neuroscience is the belief that during wakefulness an unbroken stream of consciousness is experienced by an enduring self.

A further feature of the Abhidhamma's treatment of consciousness is poignant when it comes to thinking about the aspiration to attain more wholesome states. For Buddhism, all the stages comprising a

complete process of perception—including the very earliest—are *conscious*. This differs from the general view of cognitive scientists (notwithstanding the arguments of Zeki) who hold that the initial stages are *preconscious* (Velmans, 1999). That is to say that the stages entailed in preliminary analysis of the sensory input and activation of associations en route to establishing the meaning of the input, occur prior to an end-stage identified with consciousness. Contemporary psychology generally views the neural activity during the milliseconds that these initial stages are unfolding as having no connection with consciousness. At some point (the end-stage) the magical ingredient appears and we become conscious of the visual scene in front of our eyes. Now, leaving aside the crucial question of what exactly that magic is (dealt with at length in Lancaster, 2004), we have the terminological variance between the two ways of thinking: for the Buddhist all stages are *conscious*; for the cognitive scientist, most are *preconscious*. This is not an empty divergence of words; language is important.

By calling early stages in the process *preconscious*, we infer that they are beyond our control; they are automatic and machine-like. Buddhism identifies these same stages as conscious because the whole thrust of the Abhidhamma is towards transforming one's reactivity; the path towards *nirvana* entails ensuring that the mind remains affectively neutral to stimuli at an early stage in the perceptual process. The adept is able to assert his or her will in the early stages to bring about non-harmful consequences. In point of fact, this is not an issue of what consciousness actually is; rather, it critically concerns how one trains the mind. Unfortunately, the terminology of cognitive science distances us from the possibility of such training.

Many have argued that these kinds of Buddhist theories sit well within the physicalist ontology, but there are aspects of the Abhidhamma that are challenging, most notably the role of karma. Karma determines the way in which the final instantiations of consciousness of one life condition the next at the moment of conception. The medium through which karma operates may not be transcendent to the natural order, but it clearly stretches the paradigm dominant in psychology. Thus, at the very least, the possibility of karma challenges our

understanding of memory and the medium through which causality operates. The notion that, "depending on the locations of the death and birth, there can be a physical space between the two events, but there is no mental space between them" (Ratnayaka, 1981, p. 83) challenges us to consider how mental causation intersects with physical causation in the brain, where the brain is the physical substrate of mind. Is it legitimate simply to cherry-pick those aspects of Buddhism that do not challenge us in this way, and to leave out other teachings such as that of karma, for example? I would argue that Buddhism is fundamentally about cultivating wisdom, and that engaging with an emaciated mindfulness training, and attempting to fit its teaching into a limited physicalist ontology, leaves out much that is central to that goal.

While there may be solid grounds for recognising the disunity of consciousness, our everyday experience is generally of a unified stream. How might we reconcile the difference? In neuroscientific terms, the answer concerns the '**re-entrant**' neural pathways, whereby 'higher' areas in the visual processing system re-align activity in 'lower' areas, the term 'lower' meaning closer to the beginning of the neural pathway in the brain (Clifford, 2010; Lamme, 2006; Lancaster, 2011a). Psychologically, such activity appears related to the construction of a sense of 'I' that becomes a concomitant of the meaning applied to sensory processing. As many mystical traditions aver, the 'I' which seems to be the witness to events such as those of perception and thought, etc. is not an enduring and coherent entity; rather, it is a retrospective construction, associated specifically with this illusory sense of conscious continuity. Again, detailed analysis demonstrates how integrating mystical and neurocognitive thinking along these lines enriches both areas, while framing new avenues of research (Lancaster, 2004; Varela, Thompson, & Rosch, 1991).

The operation of these neural systems, whereby a sense of the unity of consciousness is fostered through feedback loops involving re-entrant pathways, exemplifies a more overarching pattern described in kabbalistic texts dating back at least to the thirteenth century (Lancaster, 2011a, 2011b). In very simplified outline, the kabbalistic teachings portray higher realms in the macrocosmic hierarchy being stimulated

from below and acting back on the lower level, bringing divine influx and harmony to the entire system. While the focus of this kabbalistic scheme is on the macrocosm, it is presented as a master plan which is recapitulated at all levels, presumably including that of the individual human brain. Again, we find an enriching degree of consonance between an ancient mystical tradition and recent research into the functioning of the brain.

As in the case of Buddhism discussed above, the Kabbalah is not simply teaching about consciousness and the macrocosm as an abstract intellectual exercise; the primary imperative is to encourage as to work on ourselves—to aspire to higher states of being. In this regard, the Kabbalah focuses on the work of *unification*. While the view from the Kabbalah is in agreement with that of Buddhism that the mundane state of mind is characterised by its *disunity*, Kabbalah holds that through contact with the ultimate unifying factor, the divine, the diverse 'sparks' of consciousness can be integrated. In fact, such unification is directed not only at individual wellbeing, but also towards the harmony of the whole cosmic system (Lancaster, 2008). Meditative practices of unification abound in the kabbalistic tradition, most involving working with the names of God in various concentrative ways. Again, constructive integration between mystical teachings and psychological science can be forged here. Striving towards greater unification in the mind is conducive of wellbeing. The kabbalistic practices encourage detaching from the ego—viewed as a limiting factor in the overall harmony of the mind—and reframing in relation to a higher integrative center.

Finally, is it possible to build bridges not only between mysticism and psychological science, but also across diverse spiritual and mystical traditions? My own view is that addressing this question is actually the most important contribution that transpersonal psychologists have to make to our culture (Lancaster, 2005). Restricting myself here to just the brief details I have drawn from Buddhist and kabbalistic systems, I should like to stress the complementarity between them, especially when viewed through the lens of psychology. Buddhism emphasises the

minutiae of mind and the meditative practices that enable one to transform precise aspects of processes that most would regard as automatic. Kabbalah offers insights into paths to achieving higher levels of integration. But let me be clear: I am not suggesting that either one tradition *needs* the insights of the other; each has developed effectively in relative isolation over long periods. But in our day, scientific psychology has become a lens through which views on the nature of mind as promulgated in spiritual and mystical traditions should be viewed. Using this lens, we can clarify where and how practices passed down through the various traditions fit into a larger scheme. Indeed, it is my view that our greatest hope for understanding consciousness as thoroughly as may be possible will come through further integration between scientific and mystical ways of knowing.

References

Banerjee, R. (2007). Buddha and the bridging relations. In R. Banerjee, & B. Chakrabarti (Eds.), Progress in brain research, Models of brain and mind: Physical, computational and psychological approaches. Amsterdam: Elsevier.

Beauregard, M., & O'Leary, D. (2007). *The Spiritual Brain: A Neuroscientist's Case for the Existence of the Soul.* HarperCollins.

Chorost, M. (2013). Where Thomas Nagel went wrong. The Chronicle Review, May 13, 2013. Retrieved October 29, 2013 from https://chronicle.com/article/Where-Thomas-Nagel-Went-Wrong/139129/.

Clifford, C. W. (2010). Dynamics of visual feature binding. In R. Nijhawan and B. Khurana (Eds.), *Space & Time in Perception & Action.*(pp. 199-215). Cambridge: Cambridge University Press).

Collins, S. (1982). *Selfless Persons: Imagery and Thought in Theravada Buddhism* Cambridge: Cambridge University Press.

Cousins, L. S. (1981). The *Patthana* and the development of the Theravadin Abhidhamma. *Journal of the Pali Text Society*, 9, 22-46.

Ferrer. J. N. (2002). *Revisioning Transpersonal Theory: A Participatory Vision of Human Spirituality*. Albany, NY: State University of New York Press.

Hick, J.(1980). Mystical experience as cognition. In R. Woods (Ed.) *Understanding Mysticism*. New York: Image Books.

Katz, S. T. (2000). Mysticism and the interpretation of sacred scripture. In S. T. Katz (Ed.), *Mysticism and Sacred Scripture* (pp. 7-67). Oxford: Oxford University Press.

Koch, C. (2004). *The Quest for Consciousness: A Neuroscientific Approach*. Englewood, CO: Roberts and Company .

Lamme, V. A. F. (2006). Towards a true neural stance on consciousness. *Trends in Cognitive Sciences*, 10(11), 494–501.

Lancaster, B. L. (1997). On the stages of perception: towards a synthesis of cognitive neuroscience and the Buddhist *Abhidhamma* tradition. *Journal of Consciousness Studies*, 4, 122-42.

Lancaster, B. L. (2002). In defence of the transcendent. *Transpersonal Psychology Review*, 6 (1), 42-51.

Lancaster, B. L. (2004). *Approaches to Consciousness: The Marriage of Science and Mysticism*. Basingstoke, UK: Palgrave Macmillan.

Lancaster, B. L. (2005). The Transpersonal as a Framework for Dialogue: A Jewish Perspective. In J. Drew & D. Lorimer (eds.). *A Way through the Wall: Approaches to Citizenship in an Interconnected World*. Corpus Publishing.

Lancaster, B. L. (2011a). The hard problem revisited: from cognitive neuroscience to Kabbalah and back again. In H. Walach, S. Schmidt, & W.B. Jonas (Eds.), *Neuroscience, Consciousness, and Spirituality. Springer*.

Lancaster, B. L. (2013). Neuroscience and the Transpersonal. In H. Friedman and G. Hartelius (Eds.), *Wiley-Blackwell Handbook of Transpersonal Psychology*, (pp.223-240). Chichester, UL: Wiley.

Lancaster, B.L. (2008). Engaging with the mind of God: the participatory path of Jewish mysticism. In J. Ferrer & J. Sherman (eds.), *The Participatory Turn: Spirituality, Mysticism, Religious Studies*. New York: SUNY Press.

Levine, J. (1983). Materialism and qualia: the explanatory gap. *Pacific Philosophical Review*, 64, 354-61.

Levine, J. (2001). *Purple Haze: The Puzzle of Consciousness.* Oxford: Oxford University Press.

Lutz, A., Dunne, J. D. & Davidson, R. J. (2007) Meditation and the neuroscience of consciousness: An introduction. In P. D. Zelazo, M. Moscovitch, & E. Thompson (Eds.), The Cambridge handbook of consciousness (pp. 499-551). Cambridge, UK: Cambridge University Press.

Nagel, T. (2012). *Mind and Cosmos: Why the Materialist Neo-Darwinian Conception of Nature is Almost Certainly False.* Oxford: Oxford University Press.

Nicoll, M., *Psychological Commentaries on the Teaching of Gurdjieff and Ouspensky, Shambahala* (5 vols) (first published 1955-6), 1984.

Ratnayaka, S. (1981). Metapsychology of the *Abhidharma.* The journal of the International Association of Buddhist Studies, 4(2), 76-88.

Smart, N. (2000). Mysticism and scripture in Theravāda Buddhism. In S. T. Katz (Ed.), *Mysticism and Sacred Scripture* (pp. 232-241). Oxford: Oxford University Press.

Spencer, J. H. (2012). *The Eternal Law: Ancient Greek Philosophy, Modern Physics, and Ultimate Reality.* Vancouver, BC: Param Media.

Underhill, E. (1980). The essentials of mysticism. In R. Woods (Ed..), *Understanding Mysticism* (pp. 26-41). New York: Image Books.

Varela, F. J., Thompson, E. & Rosch, E. (1991). *The Embodied Mind: Cognitive Science and Human Experience.* Cambridge, Mass: MIT Press.

Zeki, S. & Bartels, A. (1999). Toward a theory of visual consciousness. *Consciousness and Cognition.* 8, 225–259.

Zeki, S. (2003). The disunity of consciousness. Trends in Cognitive Sciences, 7, 214–218.

Glossary

Ontology. The philosophical study of the nature of being and reality.

Physicalism. Ontological view that there is no reality other than that which is physical. Hence, **physicalist ontology**.

Neural correlate of consciousness. The minimal set of neural mechanisms that accompany a specific conscious event or state. The term 'correlate' is used to emphasize that the question of causation is undetermined.

Mindfulness. A state in which one's complete attention is intentionally focused on experience in the present moment without a judgemental attitude.

Abhidhamma. The *Abhidhamma Pitaka* is one of the three sections of the Pali canon of Theravada Buddhism. 'Abhidhamma' means "higher teaching," and this scripture systematizes the Buddha's understanding of experienced reality.

Karma. The universal principle of cause and effect in Buddhist thought, whereby actions have impact on the actor, both throughout the lifetime and in reincarnation.

Kabbalah. The mystical tradition in Judaism, focused on comprehending the emanations of God and the human relationship to the divine. The Kabbalah addresses the Hebrew Bible's secret level of meaning.

Transcendent. Beyond the range of normal or physical human experience. Applied to the divine, the term means that aspect of God that is beyond the physical and therefore absolutely outside the range of human knowing. When applied to human experience, the term 'transcendence' generally means beyond the normal sense of self and need not imply a radical departure from a physicalist ontology.

Explanatory gap. The absence of any definitive explanation of how or why consciousness is related to physical events. Our inability to understand the connection between consciousness and the brain.

Occam's razor. A scientific and philosophic rule that entities should not be multiplied unnecessarily. Preferred explanations of unknown phenomena are those that use the minimum number of constructs that account for the facts.

Scientism. The view that the only valid way of knowing is scientific knowing.

Re-entrant neural pathways. Neural pathways in the brain that originate in higher areas in a processing pathway, and connect back via synapses in lower areas, 'lower' meaning closer to the beginning of the pathway.