

The Cognitive Neuroscience of Consciousness, Mysticism and Psi

Les Lancaster

Liverpool John Moores University
Liverpool, UK

The greatest contemporary challenge in the arena of cognitive neuroscience concerns the relation between consciousness and the brain. Over recent years the focus of work in this area has switched from the analysis of diverse spatial regions of the brain to that of the timing of neural events. It appears that two conditions are necessary in order for neural events to become correlated with conscious experience. First, the firing of assemblies of neurones must achieve a degree of coherence, and, second, reflexive (i.e. top-down, or re-entrant) neural pathways must be activated. It does not, of course, follow that such neural activity causes consciousness; it may be, for example, that the neural activity formats the brain to interact with consciousness. The latter possibility is suggested by analysis of mystical texts suggesting that coherence and reflexivity constitute the conditions for the influx of “spirit.” Kabbalistic sources, for example, describe a hierarchy of “brains” in the human and divine realms through which the principles of coherence and reflexivity operate. Whilst the ontological assumptions of such a scheme place it beyond the realm of psychology, parallels with the picture deriving from the contemporary cognitive neuroscience of consciousness are striking.

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The Principle of Isomorphism

Two principles that are central to the Neo-Platonism that became incorporated in the teachings of the Kabbalah¹—*emanation* and *isomorphism*²—are treated somewhat cryptically in the following passages:

The highest wisdom that is concealed in the head of the Holy Ancient One is called the supernal brain, the hidden brain, the brain that is tranquil and silent; and no-one knows it other than He Himself. . . . When the white brilliance is formed in the light, it distils its essence into this brain, which is illumined; and there emanates from this precious influence another brain which expands and shines into 32 paths.

The light of wisdom expands in its 32 directions emanating from the light that is in the concealed brain. There is hewn from wisdom a light that streams forth and proceeds to water the garden. It enters into the head of the “Small Face,” and forms a certain other brain. And from there it is extended and flows

into the whole body, and waters all those plants, as it is written: “And a river went out of Eden to water the garden. . . .” (*Genesis* 2:10). (*Zohar* 3:288a, 289b; extracts from *Idra Zuta Kadisha*)

Emanation is the modus of creation whereby the unknowable essence of God becomes expressed through a series of stages, like light poured into a succession of containers. Isomorphism is the doctrine that lower structures in the emanative hierarchy correspond to higher ones. In the above extract, the “brain” of the “Small Face” is isomorphic with the “brain” of the “Holy Ancient One” (elsewhere referred to as the “Large Face”), both “brains” being symbolic components of the Godhead. Furthermore, in this kabbalistic scheme, both of these “brains” are, in turn, isomorphic with the human brain, which may be understood as a lower emanation of the higher brains. As Shokek (2001) put it, God and man are *isomorphic* in that they “share the same structure and are logically equivalent” (p. 6). The isomorphism here becomes evident in the notion of the

“32 paths,” which may be identified with the spinal cord and its associated 31 pairs of spinal nerves “emanating,” as it were, from the brain (Lancaster, 2005).

The anthropomorphism in the extract is clearly not to be taken literally; the core injunction against images of God is paramount for the author of the *Zohar* and other works of Jewish mysticism that explore concepts portrayed as anatomical features of the divine. Nevertheless, the isomorphism is critical for both speculative and practical aspects of Kabbalah. Speculation about higher things is centered on understanding of the *correspondence* with ontologically lower things: “From the “I” of flesh and blood you may learn about the “I” of the Holy One, blessed be He,” runs a Jewish *midrashic* text.³ As Wolfson (2005) poetically put it, “God, world, and human are intertwined in a reciprocal mirroring” (p. 32). Being “in the image of God” (Genesis 1:27) is, for the kabbalist, not merely a statement of the dignity of being human, but becomes a key to knowing God through grasping the essence of one’s being. And this same correspondence underpins practices whereby mystics aspire both to receive an influx from higher regions and to ascend to those regions. Central to these approaches is the *Torah*, understood in Judaism not as simply a book, but as the organic axis of communion between God and man. Hence, there are three parties to this isomorphic chain: “God, Torah and man share the same structure, and this is the reason why the scholar is able to ascend on high” (Idel, 2005, p. 141). As Idel continued, this “chain of anthropomorphic entities... descends from the divine and enables return there.”

Of what relevance might such mystical musings be to the more scientific quest to understand the brain’s role in relation to anomalous experience? One school of thought would have matters religious or mystical in one domain and matters physical in another; religion and science as two *nonoverlapping magisteria* (Gould, 2001). I do not share this view, and it is the principle of isomorphism that leads me to open a different perspective here. Let me clarify at the outset that I am aware of the difficulties; the kind of mysticism with which I have opened posits ontologically separate domains. At best, one might regard its notion of “higher” brains as quaint, poetic, or even as having some meaning psychologically—symbolising different levels of the psyche, for example. However, the seemingly dualist worldview that it purveys cannot, by definition, sit easily with the worldview of science.⁴ Moreover, even if one deems it useful to

recognize a higher ontological realm, *why* should it be isomorphic with the lower, physical domain?

Leaving aside the ontological question, there are grounds for recognizing a basis for isomorphism in the natural realm. Noting that there are significant parallels between quantum phenomena and the nature of consciousness, Hunt (2001) argued that this reflects the “parsimony of nature”: “the most parsimonious way forward here is to posit an emergentist solution, in which consciousness appears in the universe as the most hierarchically complex system we know, or possibly could know, and which re-creates, on its new emergent level, principles first manifested on quantum and nonlinear systems levels” (p. 36).

Consciousness is the central enigma here. In my view, the parsimony to which Hunt referred may extend beyond this parallel with quantum systems to embrace phenomena associated with mysticism and parapsychology. Kelly (2007) has emphasised that an understanding of psi phenomena depends on a broad sweep over areas including mysticism, dreaming, and genius. The core psychology of anomalous experience may be one and the same across these varied expressions of consciousness. And, critically, these expressions are by no means the trivia of human life; they represent the very dignity of being human. Ignoring the deep question that unifies them on the grounds that science is not yet able to accommodate it is not only to make a false god of science but also to turn one’s back on the most inspiring and transformative aspects of human experience.

As the next section should demonstrate, the understanding of consciousness that comes from contemporary cognitive neuroscience reveals significant parallels with ideas found in spiritual and mystical traditions. For cognitive neuroscience the concepts that find parallels in mystical writings, namely *reflexivity* and *binding*, indicate something about the *mechanisms* involved in neural systems correlating with consciousness, but fail to answer fundamental questions about the essence of consciousness (i.e., *phenomenality*). There is simply an act of faith which assumes that advancing the understanding of mechanism will bring insight into the question as to why any neural activity should relate to phenomenality. The mystical approach extends the principles of reflexivity and binding through the additional notion of isomorphism. My argument is simply that the parallels to be examined suggest a rationale for further examining the principle of isomorphism for

the insight it may bring to fundamental questions as yet unanswered in discussions of consciousness. Perhaps this exploration may offer a model of the mind that can effectively incorporate data from parapsychology.

So... how does the light get in?⁵

Contemporary Neuroscience of Consciousness

Given the putative relations between areas such as consciousness, mysticism, and psi phenomena, it follows that the understanding of any one of these areas may be advanced through scholarship and research in the other areas. Each area is associated with certain strengths and weaknesses: The study of psi is strong on data but, for many, somewhat weak on theory. Mysticism brings rich formulations of the nature of mind and of reality, predicated not only on core texts and/or experiences but also on a strong commentarial tradition. The key claims associated with mysticism may, however, be weak in terms of empirical assessment. The area best captured in the term “consciousness studies” is strong in its empirical approach but weak in its philosophical coherence. This weakness concerns not only its invariable adherence to a neuro-physicalist (Lancaster, 2004) worldview, which can be challenging to many, but also its commitment to representationalism, which has all the hallmarks of a dogma devoid of real support (see recent discussion in Gauld, 2007). My claim is that integrating these areas broadly allows one to cancel out some of the more extreme of the weaknesses associated with each, and to build new explanatory models through a kind of *triangulation* process (see especially Lancaster, 2004, for a fuller treatment of the issues).

Let me assert my bias at the outset: The domain of neuroscience is *not* going to reveal *how the light gets in!* Of course, many would immediately deny any such notion as a need for “the light to get in,” holding instead that the activity of certain brain structures or temporal patterns of neural activity simply *is* consciousness, or that such activity *gives rise* to consciousness as an *emergent* property. Here is not the place to debate the alternatives; I simply want to explore the core brain processes that have been well documented as critical *correlates* of consciousness. As mentioned above, there are two such core processes: neural *reflexivity* and *binding*.

Reflexivity

The immense complexity in the brain’s systems may be simplified by recognizing three forms of connection:

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1. **Feed-forward connections** bring information from the sensory receptors into the brain and through a hierarchical system that functions primarily to detect the presence of feature elements in the sensory array. In the case of vision, for example, nerve fibers originating in the retina, travel via the thalamus into the visual regions of the cerebral cortex. The feed-forward system continues from the first visual area of the cortex (V1) through a succession of areas (V2, V3, V4, etc), each specialized for detection of differing aspects of the input. The feed-forward system runs via two streams towards ‘higher’ regions of the cortex. The term ‘higher’ in this context is applied to a region that includes considerable non-sensory activity. ‘Lower’ regions are driven mainly by sensory input; whereas the activity of ‘higher’ areas involves memory and other cognitive functions.
2. **Horizontal connections** are found between neurons at the same level in the hierarchy. They function to sharpen responses via inhibitory interconnections. In the visual system, for example, such *lateral inhibition* can increase levels of contrast, thereby facilitating object recognition at higher levels in the system.
3. **Re-entrant connections** consist of fibers originating in higher areas that project back onto the feed-forward activity at lower regions. The term *recurrent processing* refers to the influence of re-entrant pathways on the feed-forward system. The presence of re-entrant pathways enables the brain to operate as a dynamic, interactive system. Re-entrant pathways are extensive, with, for example, a larger number of fibers heading from the cortex to the thalamus than in the opposite (feed-forward) direction. Re-entrant fibers are found down to the level of receptor neurones. It has been demonstrated that recurrent processing functions to modulate the responses of the feed-forward system.

A growing body of evidence suggests that consciousness is dependent on recurrent processing (Dehaene, Changeaux, Naccache, Sackur, & Sergent, 2006; Edelman & Tononi, 2000; Lamme, 2003, 2004, 2006). The evidence largely comes from studies of the timing of events in the brain’s perceptual systems, using, for example, *trans-cranial magnetic stimulation* to interfere with neural activity in discrete brain areas at specific times (Pascual-Leone & Walsh, 2001), and

from studying paradigms such as *backward masking* (e.g., Supèr, Spekreijse, & Lamme, 2001) and the *attentional blink* (e.g., Sergent, Baillet, & Dehaene, 2005). Thus, for example, it is not possible to differentiate between masked (i.e., not consciously perceived), and unmasked (consciously perceived) stimuli in terms of the specific brain regions that are activated (Dehaene et al., 2001). Rather, the explanation of masking is to be found in terms of a mismatch between feed-forward and re-entrant data. According to this explanation, by the time re-entrant activity related to the original stimulus reaches V1, the activity in V1 is being driven by the mask and is no longer related to the original stimulus. Dehaene et al. concluded that the data “are consistent with theories that relate conscious perception to the top-down [i.e., recurrent] amplification of sensory information through synchronous co-activation of distant regions” (p. 757).

These conclusions about the role of recurrent activity are further supported by research into neurological conditions in which residual cognitive functioning can be sustained in the absence of conscious awareness. One such condition, *blindsight*, describes a condition in patients following extensive damage to V1 over one half of the brain. In brief, these patients have no visual awareness of material presented in the affected areas of the visual field, but are nevertheless able to make successful guesses about a number of features of the visual content (Weiskrantz, 1986). Available evidence suggests that this deficit in *access consciousness* (Block, 1995, 2005) in blindsight is due to the failure of recurrent processing (Gonzalez Andino, Menendez, Khateb, Landis, & Pegna, 2009; Lamme, 2001). The condition would seem to be caused by the failure of the re-entrant pathway to V1 to intersect with the feed-forward stream. There can be no interaction in V1 on account of the simple fact that V1 is not functioning.

Lamme (2006) succinctly captured the essence of this principle of reflexivity in his assertion that, “RP [recurrent processing] is the key neural ingredient of consciousness. We could even define consciousness as recurrent processing” (p. 499). While agreeing that recurrent processing is the key neural ingredient that correlates with the immediate sense of access consciousness, I would refrain from defining consciousness in this way. As argued more fully elsewhere (Lancaster, 2004), a definition of consciousness requires a recognition of different *dimensions* of consciousness. Recurrent processing appears to be the key ingredient

in the brain mechanisms involved with the dimensions of *intentionality* and *accessibility*. This form of processing does not, however, account for the fundamental dimension of *phenomenality*.

Binding Mechanisms

Many have stressed the importance for understanding the neural correlate of consciousness of the *binding problem* (Crick & Koch, 1990; Treisman & Schmidt, 1982; Treisman, 1996). The problem concerns how the brain registers that certain neural responses should be linked with others in order to establish the presence of whole objects in the world. If I am looking at a pen lying on my desk, the feed-forward visual sweep will detect a host of features in the sensory array. The question is, on what basis can the brain determine that a subset of these features (e.g., those relating to the pen) belong together?

The emphasis on recurrent processing leads to a straightforward answer, namely that the feed-forward sweep does not itself establish the presence of objects. Recognition of objects requires the contribution of recurrent processing. It is likely that the feed-forward system simply detects the presence of basic features in the visual input. On the basis of these features, higher cortical regions connected with the memory store become activated, with those structures (memory traces, or *schemata*) sharing the greatest number of features with the sensory analysis becoming the most highly activated. The re-entrant system then modulates the responses of the feed-forward system in an attempt to establish whether or not the most activated schemata can match the current input. Again, considerable research underpins the summary view of Enns and di Lollo (2000) that the perceptual system, ‘actively searches for a match between a descending code, representing a perceptual hypothesis, and an ongoing pattern of low-level activity. When such a match occurs, the neural ensemble is “locked’ onto the stimulus” (p. 348). The stages hypothesized as being involved in the perceptual process are represented in Figure 1.

Models of this kind have replaced those favored some 30 years ago that stressed only the *spatial* aspects of brain organization. Previously, the search was for increasing evidence of *localization of function*, with consciousness being seen as merely the most complex in a hierarchy of functions. Over recent years, however, there has been a major shift towards greater emphasis on the temporal dimension of cerebral processing.

As first proposed by von der Malsburg (1981), it is the temporal dimension of neural signals that underpins the binding of neurons into functional groups. Much research has demonstrated that phase synchrony in the gamma band (40Hz approx) is established between neurons, and groups of neurons that are functioning together at a given time (for reviews and overviews, see Engel & Singer, 2001; Revonsuo, 1999; Singer, 1999, 2000). Such neural phase synchrony, or *coherence*, is viewed by many as a necessary condition for consciousness.

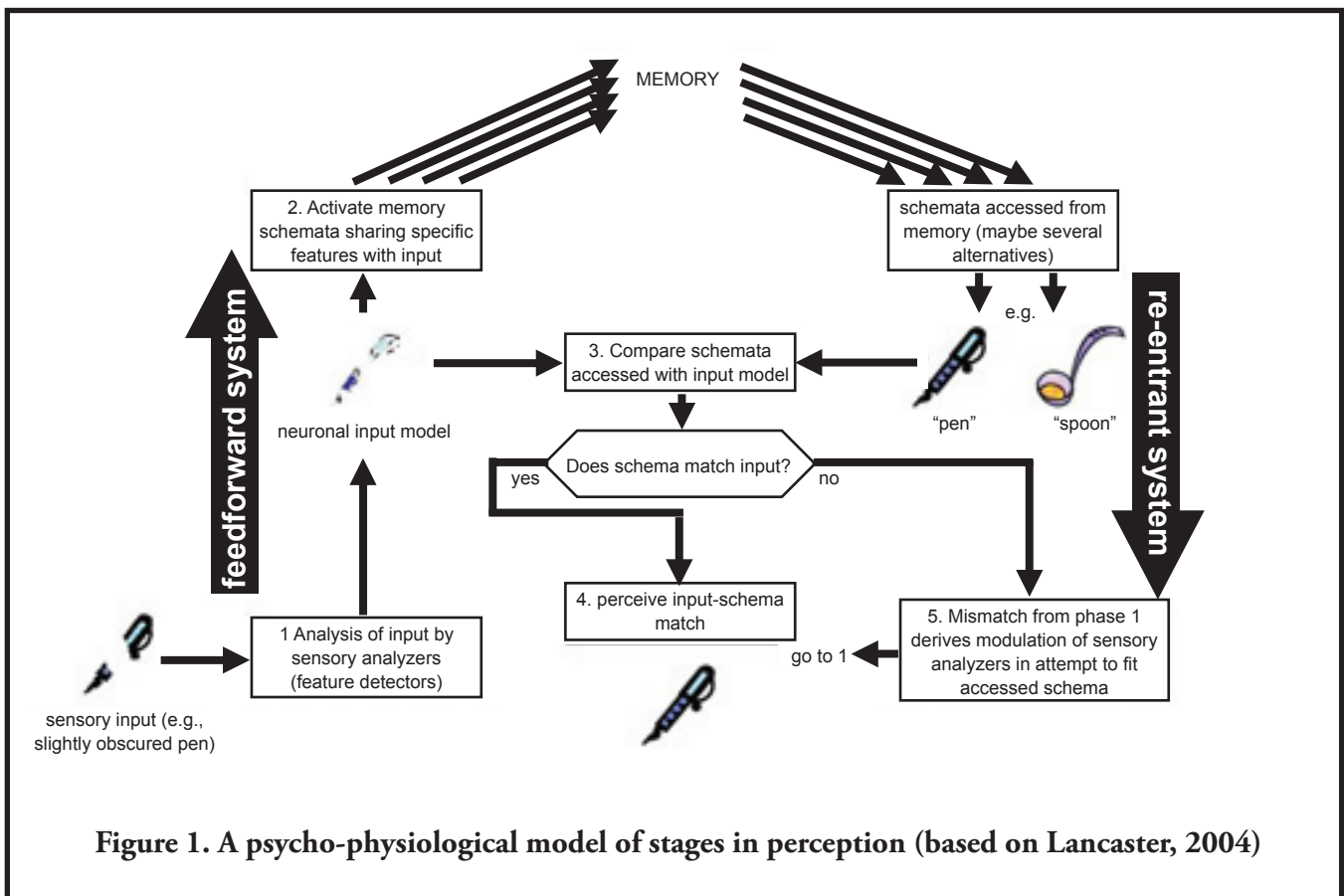
The relation between neural coherence and consciousness is unlikely to be monolithic, however. It has been demonstrated, for example, that levels of coherence in neural firing actually increase during anaesthesia (Vanderwolf, 2000). It is necessary to distinguish binding in the feedforward pathway alone, which is unlikely to be the correlate of consciousness, from binding which unifies feedforward and recurrent processing. It is this latter which appears to underlie the brain's relation to consciousness. It is this form of binding which, for example, would be involved in the unification across different orders of cognitive representation that

has been proposed as the basis of consciousness (see, for example, Kriegel, 2007).⁶

Introspectively, one of the hallmarks of consciousness seems to be its unity; there is a *oneness* across all the diverse features of awareness at any given time. It should come as no surprise, then, to find unification, signalled by neural coherence, as the brain feature most related to consciousness. As von der Malsburg (1997) put it,

we experience mind states of different degrees of consciousness, and...the difference is made by the difference in the degree of coherence, or order...between different parts of the brain. Let us, then, describe a state of highest consciousness as one characterized by global order among all the different active processes.... A globally coupled state could be one in which all the different [parts] are phase-locked to each other. (pp. 196-197)

Bearing in mind the earlier discussion of the key role of neural reflexivity in relation to consciousness, von der Malsburg's assertion must be qualified with the proviso that the global coupling entails



interactions between feedforward and re-entrant neural pathways.

Reflexivity and binding in mystical language

In this section I shall explore some parallels between the above key principles of brain function related to consciousness and ideas central to various mystical systems. I shall draw specifically on the Kabbalah, but, as I have indicated elsewhere (Lancaster, 2004), the key ideas have found expression in diverse mystical traditions. I believe a strong case can be made that the two core principles of brain function related to consciousness have been anticipated in the mystical traditions. The question is: What inferences does one draw from the parallels? Putting it simply, if the parallels are accepted as in some sense significant, then there would seem to be three alternative ways to explain them: (1) They may be attributable to chance (which I doubt); (2) to the mystics having uncannily accurate insight into brain function (which I also doubt); or (3) to the mystics' grasp of principles finding expression at different levels in the "created" hierarchy—due to the isomorphism I discussed earlier. It is this latter alternative which will be further explored in the final section of the chapter.

As Scholem (1941/1961) noted, the essential idea of the impulse from below stimulating that from above—as portrayed in the following excerpt—is central to the *Zohar's* narrative:

Come and see. Through the impulse from below is awakened an impulse above, and through the impulse from above there is awakened a yet higher impulse, until the impulse reaches the place where the lamp is to be lit and it is lit ... and all the worlds receive blessing from it. (*Zohar* 1:244a)

Activity at the lower ontic level is "magically reflected" at the higher level (Scholem, 1941/1961, p. 233). If the lower impulse is acceptable, then the response is "blessing," that is, "light from the supernal lamp," or "oil emerging from *The Holy Ancient One*" (p. 233). There are many metaphors to describe this influx from the higher level. All of them may be best understood in modern terms as concerned with the arising and flow of consciousness.⁷

The picture emerging from cognitive neuroscience parallels this more cosmic picture. As discussed above, intentionality and access consciousness seems to be dependent on recurrent processing. The impulse from below (detection of elemental features in sensory

activity and their integration in a *neuronal input model*) brings about "higher" activity (memory readout), which acts back on the "lower" activity, bringing consciousness of the perceptual object. Stated in this crude form, however, the analogy may be less than convincing. A deeper analysis is required to support the substance of the analogy.

One may start by noting that the parallel extends into the *means* whereby recurrent processing is effected. As discussed above, this seems to depend on the binding mechanisms achieving phase synchrony among neurons. Analogously, at the cosmic level, awakening of the higher influx depends upon unification of the lower "limbs": "Whenever all the parts of the body are brought together in a single bond enjoying pleasure and delight from the head, above and below..., then he becomes a flowing river going out of the real Eden" (*Zohar* I:247b). The "flowing river" from "Eden" is another symbol of the influx from the higher level.⁸ Indeed, the theme of sexual intercourse, whereby the disparate parts are bound together *par excellence*, is a favored image in the *Zohar's* discourse. Unification below brings about a celestial uniting that eventuates in an outpouring that nourishes those "below."

Indeed, practices directed at unification are central to the goals of Kabbalah. A description of one of these practices in the *Zohar* strikes a resonant chord with von der Malsburg's reference to "globally coupled" states quoted above:

"One"—to unify everything from there upwards as one; to raise the will to bind everything in a single bond; to raise the will in fear and love higher and higher as far as *En-Sof* [the limitless essence of God]. And not to let the will stray from all the levels and limbs but let it ascend with them all to make them adhere to each other, so that all shall be one bond with *En-Sof*. This is the practice of unification of Rab Hamnuna the Venerable, who learnt it from his father, who had it from his master, and so on, till it came from the mouth of Elijah. (*Zohar* 2: 216b)

Further examination of the concepts of "lower" and "higher" in the respective contexts will inform the comparison. Superficially, of course, the neuroscientific and the kabbalistic versions appear highly disparate. What can brain regions and functions possibly have in common with supposed mystical planes of reality? However, a

deeper grasp of the kabbalistic symbolism indicates that the “earthly” (lower) and “heavenly”(higher) spheres include features that do bring them into alignment with their proposed neurocognitive counterparts.

The lower level is in touch with the earth—it is the level of human worldly activity. This parallels the “lower” brain regions whose activity is driven by the “impulse from below,” that is, from the energy of the physical world impinging on sensory receptors. The “higher” regions, in neurocognitive terms, are those areas responsible for the memory readout which guides the perceptual process. The parallel here is to the psychological role assigned in kabbalistic thought to the sphere of *Hokhmah* (Wisdom), the highest emanation in the kabbalistic hierarchy attainable by the human mind. Dov Baer, the Maggid of Mezeritch (1704–1742), applied the term *kadmut ha-sekhel* (variously translated as “preconscious” or “unconscious”) to this sphere (see Hurwitz, 1968; Matt, 1995; Scholem, 1975). The Maggid is alluding to the higher level of (preconscious) thought that functions to format (conscious) thoughts in the human mind:

In the vessel which a craftsman makes, you find that wisdom exists in a concealed fashion. So too with thought, for thought requires a preconscious [kadmut ha-sekhel] which is above the thought that thinks.... Hence we find it written (Job 28:12) that “*Wisdom comes from nothing*” (Maggid of Mezeritch, *Or ha-Emet* 15b, as cited in Scholem, 1975, p. 355).

The higher level in both the neurocognitive model and in kabbalistic thought depicts the preconscious as the “concealed” inner process of thought.¹⁰ In Zoharic symbolism, this level is that of the thought that precedes expansion into articulation.¹¹ Similarly, in the neurocognitive model, the preconscious activation of matching memory schemata is clearly a kind of thinking that occurs prior to the meaning which accompanies a match between sensory input and memory readout. Indeed, the linguistic analogy—illustrated in the footnote—is apt, for the match of memory readout to sensory input involves one’s repertoire of language. The structuring of the memory schemata accessed during the preconscious search is essentially linguistic.¹² For the adult at least, knowing depends on the ability to name, and the meaning of the match achieved is bound up with the potential to name the object perceived.

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So Where Exactly is the Top?

Kelly (2007) raised this question in his discussion of interactive models of processing of the kind considered here. In his terminology, “recurrent activity” is replaced by “top-down interactions” which generate “projective activity”; but the principles are the same as those in the model of perception I described earlier. “So far so good,” he remarked, “but where exactly is the ‘top,’ the ultimate source of this projective activity?” (p. 41).

The “top” for the kabbalistic tradition is clearly beyond the “top” as conceived by cognitive neuroscience, principally because the former imputes ontological status to that which is “higher”: “For kabbalists, the mirror is a medium that renders appearances real and reality apparent, and hence the likeness between image and what is imaged is a matter of ontic resemblance and not simply optic reflexivity” (Wolfson, 2005, p. 33).¹³ The above quote from the Zohar concerning the “impulse from below” and that from above assumes a hierarchical series of reflexive levels, with the “light” (which I conceive of as phenomenality, the essence of consciousness) emerging only from the highest level. These levels are further conceptualized in terms of the anthropomorphic images of “brains” within the “Small” and “Large Faces” of the Godhead, mentioned earlier. Thus, Moses de León, reputed to be the editor of the *Zohar*, wrote that, “the worlds... exist in gradations, one atop the other... until they all ascend to the secret of the awesome faces whence the light emerges” (cited in Wolfson, 2005, p. 34).

This reflexive scheme is illustrated in Figure 2, in which I concatenate the material deriving from cognitive neuroscience and Kabbalah. What is known of the workings of the *physical* brain regarding consciousness occupies the two lower levels of the figure; the kabbalistic teachings regarding the “brains” in the Godhead, the upper two levels. Between these I have included the *Active Intellect*, the term employed by the medieval kabbalists (following the lead of Maimonides, foremost of the Jewish philosophers) to depict the level of mind intermediary between God and human. The figure intentionally depicts the isomorphism between brain mechanisms related to consciousness and the kabbalistic scheme whereby the “highest” levels in the created hierarchy are activated. As stated in the *Zohar* (1:70b) in the name of Rabbi Hizkiyah: “The upper world depends upon the lower, and the lower upon the upper.”

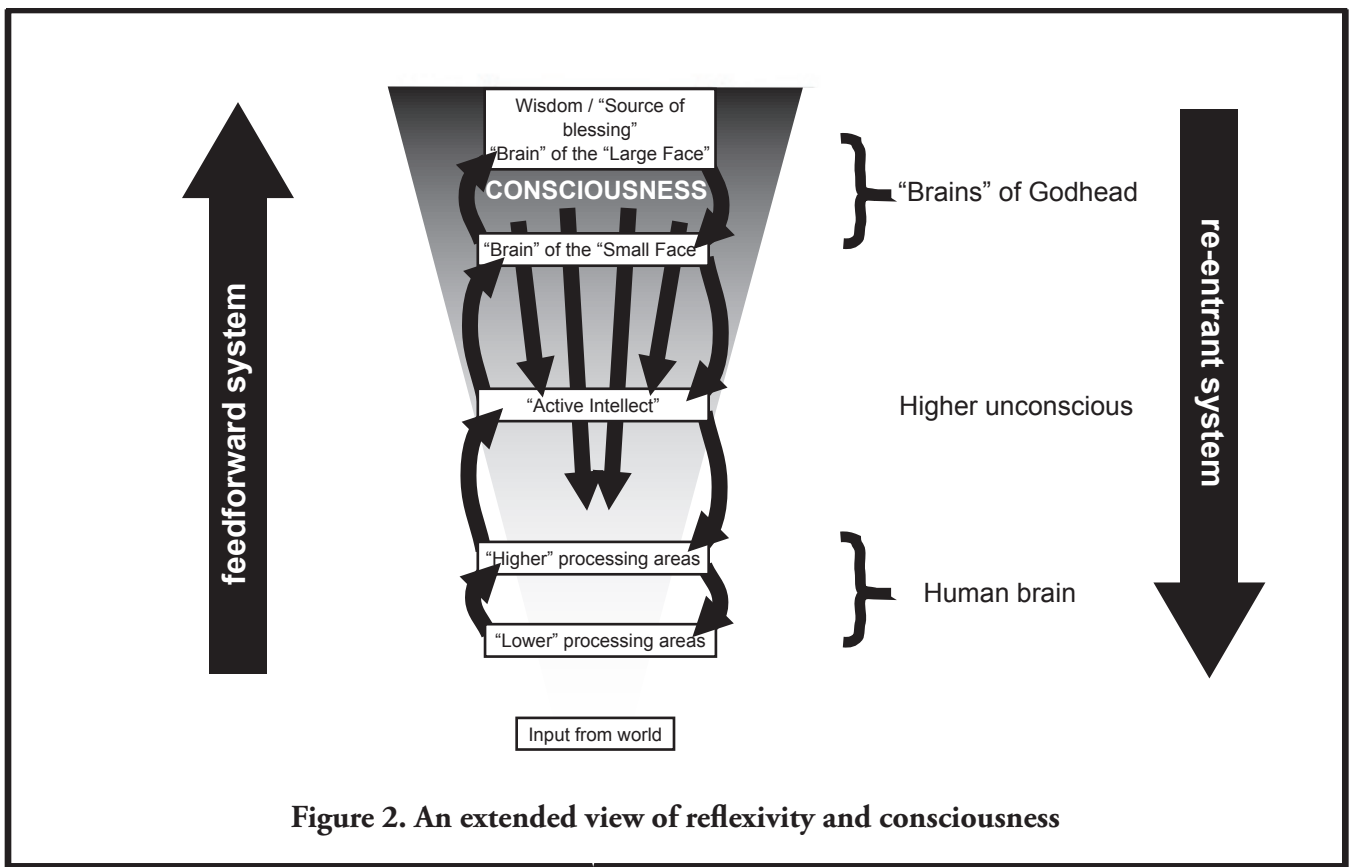


Figure 2. An extended view of reflexivity and consciousness

In the figure I have designated the *Active Intellect* as the “higher unconscious,” the term Assagioli used to depict that sphere from whence the highest intuitions and inspirations derive (Firman & Gila, 2002). The higher unconscious is also active in relation to psychic experience. That some such sphere of mind may be the realm through which psychic phenomena operate is not a new insight. The critical considerations concern, first, the evidence upon which one may assert the existence of such a sphere, and, second, the extent to which operational dynamics can be grasped. The claim I am making here is that these considerations are met, to at least a level that bears further exploration, by the isomorphic principles depicted in Figure 2. In other words, given the two observations that neuroscience has not as yet found any solution to the hard problem of consciousness, and that known features of brain processes related to consciousness accord with the functional principles conveyed in the relevant mystical literature, then serious consideration of the approach to consciousness found in the mystical tradition may be warranted.

This is not to imply that all details of the mystical scheme should be treated at face value. As

mentioned earlier, the notion of “higher brains” is at best only a metaphorical designation. The principles that escape the trappings of medieval imagery may be succinctly stated as:

1. The essence of consciousness (phenomenality) is drawn from the top of a hierarchy of isomorphic, resonant processes; and
2. While successive levels in the hierarchy, that is, *levels of mind*, interact with their neighbors above and below, they also operate in ways that are distinctive.

In relation to point 2, the Active Intellect, or higher unconscious, may be viewed as interacting with the human brain in the same reflexive way as operates within the brain’s perceptual systems. At the same time, it has its own, distinctive sphere of operation which includes *archetypal complexes*, inspiration, and psi phenomena. Its status in the medieval scheme as part-divine and part-human carried the implication that it partakes of sensibilities not carried through the bodily senses. In kabbalistic thinking, for example, the Active Intellect is identified as the collective mind through such

designations as the “Assembly of Israel,” the “Torah,” the “Holy Spirit,” and so on.

In the previous section I emphasized the preconsciousness of “higher” activity, in both cognitive, and kabbalistic, schemes. Just as upward activation in the brain preconsciously activates memories and associations pertaining to the *individual’s* prior experience relating to the current sensory array, so the feedforward system may be viewed as activating *collective* resonances in the higher unconscious/Active Intellect. Yet higher feedforward resonances open the portal of phenomenality. The final effect is that personal and collective projections enter the narrative mind of mundane consciousness via the downward re-entry system. Evidence suggesting that psi phenomena depend on preconscious processing (e.g., precognitive habituation, ganzfeld studies, etc.) imply that psi arises through stimuli primarily activating higher levels in the hierarchy, with lower levels becoming active only through subsequent recurrent processing.¹⁴

In closing, I will emphasize the issue of the *scale* brought to bear when attempting to understand psi phenomena. Whatever the details of the systems through which psi phenomena may become incorporated into interactions with the world, that these systems relate to humanity’s highest aspirations, as well as the root of consciousness, seems correct to me. The scheme I have presented here has the merit of integrating all levels from that of the discrete elements of concrete perception to that of the human role in sustaining the divine (Lancaster, 2008). While Occam’s razor might compel one to eschew “higher brains” and the like, the parsimony in having a single, twin-pronged principle of operation—that of reflexivity / binding—does pass muster.

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Notes

1. The Zohar is universally recognized as the most influential text of Jewish mysticism. It first circulated in the 13th century, leading most scholars to date its authorship to this period. Within the orthodox Jewish tradition it is generally seen as recording mystical speculations from an earlier period, and is ascribed to a second-century author, Rabbi Shimon bar Yochai.
2. As the previous note indicates, dating the origins of kabbalistic teachings is controversial. Many would hold that core ideas such as emanation and isomorphism are intrinsic to the biblical text, and that Kabbalah is some kind of ur-tradition. Whatever the truth of such claims may be, there can be no doubt that the medieval authors who shaped the mainstream kabbalistic framework which is prevalent to this day were influenced by Greek ideas, especially as formulated by Islamic philosophers.
3. *Genesis Rabbah* 90:1; *Leviticus Rabbah* 24:9. The quote is given in the name of Rabbi Levi. The term Midrash refers to a corpus of Jewish literature, dating from the second to the twelfth centuries C.E., and still of the utmost importance to the practice of Judaism today. The style of Midrash is largely homiletical, and frequently draws on word play to derive a teaching from a scriptural passage.
4. I say “seemingly” since Kabbalah holds that all such “levels” are ultimately expressions of the one true reality, that of the divine. Its worldview is thus that of idealism or neutral monism, not dualism.
5. The reference is, of course, to Leonard Cohen’s Anthem from his 1992 Album, *The Future* (“There is a crack, a crack in everything/That’s how the light gets in”). I hesitate to corrupt the poetry by spelling out a meaning in the context of my chapter. Suffice it to say that physicalism has, to my mind, not satisfactorily bridged the explanatory gap (Levine, 1983). As I argue in Lancaster (2004), the core dimension of consciousness, namely that of phenomenality, has not been satisfactorily explained in any contemporary physicalist treatment of consciousness. An extra something—a “More,” as the later James (1902/1960) would have put it—is needed for a complete understanding of consciousness.
6. “Conscious states arise from the integration, or unification, of what are initially two distinct representations, a first-order representation of an external stimulus and a higher-order representation of that first-order representation; once the two representations are unified, they form a single representational state with two parts, one directed at the other and the other directed at the stimulus” (Kriegel, 2007, p. 899). I would accord the “neuronal input model” in Figure 1 the status of first-order representation, and the schemata accessed from memory, the status of second-order representation.
7. A number of modern scholars use the term “consciousness” or “awareness” in attempting to render into contemporary language the Zohar’s symbolic language. See, for example, Giller (2001), Magid (2002), Matt (1995).
8. It is difficult in a short treatment of kabbalistic imagery to substantiate fully my claims about the intended meanings in passages such as this. Indeed, concealment of meaning is one of the hallmarks of the medieval Kabbalah. I have explored this issue at greater length in Lancaster (2005).
9. This verse from the book of Job is often translated as “From where may wisdom be found?” The Hebrew translated as “from where,” if taken more literally, means “from nothingness.” The mystics emphasized this latter meaning since it accords with their understanding that the sphere of Wisdom may be accessed only through annulment of the everyday sense of “I”; “Transformation comes about only by passing through nothingness,” wrote The Maggid (as cited in Matt, 1995, p. 87).
10. The point may be misunderstood on account of confusion over the appropriate direction in the spatial metaphor applied to notions of consciousness. Freud famously viewed the unconscious as “lower”—the portion of an iceberg under water, the basement of a house, and so on. However, as Whyte (1962) pointed out, the unconscious might be thought of as “higher” than the conscious sphere on account of its importance for “higher” creative and spiritual abilities. It is unfortunate that one is compelled to understand these psychic ideas through spatial metaphor, since it is easy to confuse the metaphor with the meaning. There is no spatiality in the psyche.
Kabbalistically, “higher” means closer to the divine. But the parallel with neuro-cognitive

terminology arises by virtue of the critical idea that the terms “higher” and “closer to the divine” mean that the process comes earlier in the generation of mental content. This is essentially the meaning of Dov Baer’s term *kadmut ha-sekhel*, which is why it should be translated as preconscious rather than unconscious.

11. Language lies at the core of kabbalistic speculation. The dynamic relationship between God and man is largely understood in linguistic terms. The Zohar frequently illustrates its paradigm of emanation by using the image of an initial spark of a thought progressing through stages until it is finally expressed in speech. The following is a typical example:

Come and see! Thought is the beginning of all. It is within, secret and unknowable. When it extends, it reaches the place where spirit dwells and is then called Understanding, which is not so concealed as the preceding even though it is still secret. This spirit expands and produces a Voice comprising fire, water, and air, namely north, south, and east.... When you examine the levels, you find that Thought, Understanding, Voice, and speech are all one, and that thought is the beginning of all—there is no separation. Rather all is one and connected as a unity, for it is actualized thought united with its source in nothingness. And will never be disunited. (Zohar I: 246b)

12. The central insight of Lacan (e.g., 1977) that the Unconscious is structured like a language, applies here.
13. It is worth noting in passing that isomorphism as presented in Kabbalah is conceptually distinct from cognitivism’s representationalism, inasmuch as the latter entails an arbitrary relation between the representation and that represented. Kabbalah asserts that the “mirror” that relates two entities (such as God and human) entails an identity of substance. Indeed, it is axiomatic that such identity is critical for any knowledge; man can know God and God can know man only because they share an essential nature. As Wolfson (2005) remarked, this axiom implies ultimately that there is no non-divine reality
14. The situation would be analogous to that in blind-sight, except that in the case of psi (i.e., in non-brain-

damaged individuals), V1 sustains the re-entrant activity. Conscious perception would incorporate the psi activity arriving through re-entrance, but the percipient would have limited ability to reflect on the source of the activity.

About the Author

Les Lancaster, PhD, is Professor of Transpersonal Psychology at Liverpool John Moores University, Honorary Research Fellow in the Centre for Jewish Studies at Manchester University, and part of the Adjunct Research Faculty at the Institute of Transpersonal Psychology, California. He is a past Chair of the Transpersonal Psychology Section of the British Psychological Society, and currently President of the International Transpersonal Association. At LJMU he co-founded the Consciousness and Transpersonal Psychology Research Unit, through which postgraduate programmes in these areas ran for some 15 years. In addition to various journal articles, Les’ published works include *Mind Brain and Human Potential*, winner of a Science and Medical Network Best Book Award, *The Essence of Kabbalah*, and *Approaches to Consciousness: the Marriage of Science and Mysticism*. In addition to his work in cognitive neuroscience, Les has made extensive studies of religious mysticism, focusing for over thirty years on the Kabbalah, and runs international workshops and courses on Kabbalistic Psychology.

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