ASK NOT WHAT BUDDHISM CAN DO FOR COGNITIVE SCIENCE;[*] ASK WHAT COGNITIVE SCIENCE CAN DO FOR BUDDHISM

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Enthusiasts for the scientific character of Buddhism wax eloquent regarding the insights that the Buddhist tradition can deliver to cognitive science, and the contributions that meditative technique can make to understanding cognitive and affective processes. To be sure, there are contributions in this direction, though their significance may be overestimated. Less attention is paid to the value of cognitive theory for developing Buddhist insights in the 21st Century, and the role of science in the dissemination of Buddhism in the modern world. I will pay some attention to that value. I conclude with some remarks on the potential value of Buddhist psychology to the development of moral psychology, an area in which Buddhism has a great deal to contribute.

1. *What well-known brain imaging studies of meditators do and do not Show*

Folks in neuroscience and folks in Buddhist Studies get very excited when brain imaging studies show that meditation transforms the brain, and that long-term meditators experience dramatic, long-term transformations in cognitive function and neural activity. (Brefczynsi-Lewis *et al.* 2007; Farb *et al*., 2007; Moore and Malinowski 2009; Tang *et al.* 2007; van den Hurk *et al*. 2010; Zeidan *et al.* 2010) The toys are impressive, and the protagonists photogenic. The results are significant, in the *statistical* sense of that word. (On the other hand, see

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Chiesa and Seretti 2010 for a sober assessment of how little these results tell us given methodological problems rife in the field.) But what is their *real* significance, for cognitive science or for Buddhism? Less than meets the eye.

First, let us ask why people get excited about the discovery that meditation produces regular, stable changes in the activity of the brain. Let's start with the neuroscientists. They are impressed that meditation techniques have neural signatures, and that long-term practice is neurally transformative. Why should they be so impressed? We know that playing the piano has a neural signature, that doing geometry has a neural signature and that imagining oneself playing tennis has a signature. Moreover, we know that acquiring expertise in any domain transforms the brain, increasing connectivity, blood supply and even neuronal density in relevant parts of the brain. That is how cognitive expertise is implemented in biological organisms like us.[1]

Meditation is one more class of cognitive activity, and meditative expertise is one more kind of expertise. One should only be surprised to discover that meditation has these consequences if one thought antecedently that it was less cognitively significant, less subject to expert learning than other cognitive activities. And of course that is precisely why so many neuroscientists are impressed. They never took meditation seriously before these studies. To *them,* we might say, these results say something: meditation techniques are real activities, and people can become expert at them. For most of us, however—those of us who have taken meditative expertise seriously as a skill—this is hardly worth writing home about, much less writing an article about.

Why should these results be important to Buddhist scholars and practitioners? We have known for a couple of millennia that mediation has effects, that some people become expert at it, and that they are transformed by meditative practice in fundamental ways. We didn't even need fMRIs to see that. What surprises the neuroscientists therefore should not surprise us. Buddhist scholars seem, beyond a certain smug satisfaction in the recognition by guys in white coats with big machines, to be interested in the fact that what we do *cognitively*

[1] Of course this is not a reason to abandon research in this area; nor is it to deny the value of that research. It is always important and interesting to determine exactly how these cognitive processes are implemented in the brain, and of considerable theoretical and clinical interest to determine what the precise cognitive, affective and neural consequences of particular meditative practices are. But these are matters of empirical detail. There is nothing surprising about the fact that there *are* such consequences and implementations.

shows up *physically*.[2] The pictures show that the brain does something when the mind does something.

But why should that be a surprise? There are some, to be sure, who might think that there are neither physical causes nor physical effects of cognitive activity. These are Buddhist dualists, who see the mind as a kind of non-physical substance or a continuum of non-physical events, not even implemented in or causally connected to the physical realm. To them, I say, "welcome to the natural world." But for most of us, who take for granted some kind of supervenience of the mental and the physical, and even for Buddhist dualists who have typically been interactionists (see the twelve links), there is nothing to get excited about. The five skandhas have in fact been regarded as causally interdependent since the dawn of Buddhist philosophy of mind and epistemology, and to have this demonstrated to the saffron-robed by the white-robed should hardly be necessary.

In short, despite all of the glitzy powerpoints and breathless rhetoric (Goleman 1996, 2003; Wallace 2003, 2206, 2008, 2009a, 2009b) about the union of insight and neurobiology, these neuroimaging results are much ado about what we all should have known already. We should have been surprised only if it all came out differently.[3] I take all of this to be pretty obvious, even if it is unpopular to say it out loud. I emphasize it only because we hear a lot about how much Buddhism has to teach cognitive science, how the truths of classical Buddhist metaphysics and philosophy of mind are finally being confirmed in the laboratory, and this work is often cited as evidence. But while this literature shows that Buddhism can provide *data* to neuroscience, for instance, regarding the particular regions of the brain involved in, or transformed by meditation, it does not demonstrate that Buddhist

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[2] Much us also made of the fact that recent research on the psychology and neuroscience of meditation demonstrates considerable neuroplasticity. Once again, less should be made of that. There is plenty of other evidence for substantial neuroplasticiy in *Homo sapiens*. Given that we know that the brain is plastic, there is nothing at all surprising about the fact that meditative practice induces change.

[3] Indeed, see Perlman et al., (2010) for the possibility that some of it *does* come out differently; mindfulness does *not* reduce the intensity of pain, although it reduces its unpleasantness, *only* as measured by self-reports. And see Khalsa et al. (2008), reporting results from the same laboratory, showing that while experienced meditators consistently *rate* their introspective skills more highly than do non-meditators, they are *no better than controls* at such introspective tasks as reporting heart rate. Curiously, the authors take these findings to show that meditation makes introspection *easier,* because of the *report* of reduced difficulty; a sober assessment would suggest that in fact meditation *impairs* introspective awareness in that meditators report improvement where there is none.

doctrine tells cognitive science *anything*. And that's not surprising either. Buddhist literature has always been kind of thin on anatomy and physiology, and the fMRI scanners, at Nālandā were pretty primitive (at least according to Xuanzang). Let's set that stuff aside then, and ask where the real action might be. I expect that it will lie in the realm of phenomenology and the cognitive science of attention, perception and memory, on the one hand, and in moral psychology on the other.

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2. *Surface vs deep phenomenology*

In order to find the real Buddhism-cognitive science interaction, we need to begin with a distinction between two kinds of phenomenology, which I call 'surface' and 'deep' phenomenology (reflecting the similar distinction that commentators such as Zahavi [2008] draw between phenomenology as introspection and phenomenology as transcendental analysis). Phenomenological reflection, even careful, illuminating reflection, and observation by sophisticated, trained observers, is directed in the first instance, almost by definition, at those cognitive states and processes that are accessible to introspection. Indeed, this is often what some philosophers and psychologists mean by 'phenomenology'—the inner world of which we have, at least in psychological principle, conscious awareness, and which we can describe. It is not always easy to introspect the world in a revealing way, of course, and reasonable people disagree about what one finds when one does look within, and especially what it is to look within, but we have a pre-theoretic fix on this inner world and our access to it. The sophisticated articulation of its contours is what I call 'surface phenomenology.'

The term 'surface' here is meant not to disparage the sophistication of such reflection, or of the theories of mental life arising therefrom, but to emphasize that phenomenology in this sense penetrates no further than the *surface* of our cognitive lives, necessarily only to that which can in principle be observed, not to the non-introspectible processes and events that underlie and generate it. This point will be clearer once we contrast surface with deep phenomenology.

Deep phenomenology is the inquiry into the fundamental cognitive, affective and perceptual processes that underlie and which are causally or constitutively responsible for those we find in introspection. This is necessarily an experimental and theoretical enterprise, not an introspective one. It is the enterprise undertaken in the West by such philosophers as Husserl and Heidegger, and by such psychologists as Simons (2000) and Rensink (2000), and in the Buddhist tradition first

in the development of the Abhidharma and later by such philosophers as Śāntarakṣita and Kamalaśila. To get a feel for the difference, consider your visual field. Right now. Is it coloured or black and white? Uniform or gappy? Simultaneously or successively apprehended? These are questions about the phenomenology of perception. In each case, the answer is not simple: shallow and deep reflection yield very different answers, although each is accurate at its respective level.

Most of us experience our visual field as richly coloured from left to right, top to bottom. That is true, but shallow. We also know that only the central 10% of the field is actually processed in colour: the rest is black and white, with the colour experience filled in by, not delivered to, central processes. Our deep visual phenomenology is hence largely monochrome; the *lebenswelt* of our surface phenomenology is a construction from the *ur-welt* of our deep phenomenology. (See Stiles 1959, Hurvich and Jameson 1960.)

We experience our field as uniform in character. We have already noted that this is not so from a chromatic point of view at the deep level. But things at the deep level are even worse: There are holes at the centre of our visual world where the optic nerve enters the retina. While these holes not introspectible, and hence not a fact of surface phenomenology, they set a task for the visual system in the construction of our introspectible experience. Moreover, our visual field is delivered to us in the form of two slightly different images that must be integrated by the visual sense faculty. At the surface level we see one world; at a deeper level, two. Philosophers and psychologists since Goethe and Schopenhauer have been aware of this phenomenon.

Finally in this parade of now commonplace facts about our visual system at the *surface* level we experience, our visual field as present to us simultaneously from edge to edge. But we know that at a *deeper* level, only small parts of it are being processed from the bottom up at any moment; the arc of our vision is generated not by a photographic transfer of what is in front of us to consciousness, but through a constantly updated stitching together of moments of apprehension of different zones within that field. What is experienced as a still photograph at the surface level is a filmstrip—or a pair of damaged filmstrips—at the deeper level. (See Fisher and Weber 1993 for a good discussion.)[4]

[4] Of course Buddhist scholars have been aware for millennia that our ordinary perceptual experience is the result of cognitive processes that operate on sensory input to yield experience of a constructed reality that is erroneously taken to be an accurate

Recent research into inattentional blindness has only amplified our sense of the disjunction between the deep and surface facts of our phenomenology. Inattentional blindness really is *blindness* at the level of surface phenomenology. But we know that a refocusing of attention eliminates that blindness. We don't see (at the introspectible level) the gorilla when we are counting the basketball catches; we do see the gorilla when we look for it. But this also tells us that at a more fundamental level—the deeper, non-introspectible level—information is cognitively available and that it is actively suppressed before reaching surface consciousness. That filtering, like the invisible seams that stitch together our visual field, and like countless other such processes that we only discover through careful experimental paradigms, is essential to the construction of the surface phenomenology we enjoy. (Simons *op. cit*.) There is far more to experience than meets they eye, or even than meets the most careful and honest introspection.

Why call this level of our psychological life phenomenological at all? For several reasons. First, it is essential to understand this deep level in order to understand our surface phenomenology. This is the stuff waking life is made of. Second, in the quest to understand what it is to be conscious, we need to understand not only that which we can report in introspection, but that which is waiting in the wings, sometimes introspectible in principle, but even if not, accessible to processes that appear to be making cognitive *decisions* that determine the character of our inner life: attend to this, not to this; patch this remembered bit into this hole; keep the field steady, even though the retinal image is moving, etc…

Perhaps most importantly for present purposes, this level of consciousness is important for understanding the interface between Buddhist theories of mind and contemporary cognitive science. This is because Buddhist philosophy of mind and psychology generally promises accounts of deep phenomenology as an explanation of our

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representation of an external world existing independently of our perceptual processes. Buddhism does not need cognitive science to tell it about *parikalpita svabhāva*. But the details regarding how this superimposition is achieved are not present in any Buddhist accounts of perception or cognition of which contemporary scholars are aware. This is not surprising. They are hard to discover. Of course there may be lost or yet-to-be-studied texts that develop cognitive theory at a level of detail comparable to that achieved in contemporary cognitive science. But we have no evidence for their existence; to simply argue that Buddhist psychology is scientific and successful, and therefore that all of current cognitive theory is anticipated in the Buddhist tradition does a disservice both to science and to Buddhism.

surface phenomenology. Buddhist accounts of perception, of memory, of attention, and of suffering typically refer to states and processes to which ordinary persons do not have introspective access. And many claims for meditative practice and expertise are claims to access these deep states in meditative equipoise; indeed the reports of meditators are often the principal—though not the only—evidence for Buddhist claims about deep phenomenology.

Buddhist accounts of consciousness are robust theoretical accounts precisely *because* they operate at this level, and the fact that processes at these levels are regarded by most Buddhists as *conscious* processes is the final reason that it makes sense to treat this level as a phenomenological level of analysis. (Indeed such enthusiasts of contemplative science as Wallace [2009] regularly urge that meditators have special access to phenomena at this level, an so can deliver useful data to cognitive science.) Indeed, one of the important features of Buddhist psychology is its identification of a variety of cognitive processes as kinds of consciousness, and hence an early insight into the complex, multilayered, and often cognitively impenetrable character of consciousness itself.

3. *Deep phenomenology matters: The myth of the givenness of consciousness*

Consideration of deep phenomenology raises complex questions about the nature of consciousness. The philosophy of cognitive science has lately been much preoccupied with the nature of consciousness and indeed there is welcome new dialogue between phenomenologists and cognitive scientists, as is evident by the success and quality of *The Journal of Consciousness Studies* and a host of recent books, articles and research programs too numerous to cite and too fecund to ignore. Buddhist philosophy has been focused on the nature of consciousness for much longer. Some have argued that the greatest contribution that Buddhist philosophy can make to cognitive science is an account of the nature of consciousness born of meditative introspection into the deep phenomenology that underlies our ordinary thought. Proponents of such a view argue that consciousness is immediately knowable, self-revealing, and hence always in principle the object of veridical apperception.

Nonetheless, on a Buddhist view, consciousness is a many-levelled phenomenon. The coarsest levels of consciousness are introspectible by ordinary agents in ordinary states; the subtler levels, however, are the ones that matter for an understanding of the nature of our experience,

and these, most traditional scholars argue, are too deep for most of us to introspect. These deeper and more subtle levels of consciousness—what many in cognitive science might regard as analogues to unconscious cognitive processes—are, however, according to most Buddhist traditions, accessible to the introspection of highly advanced meditators. Given the transparency of consciousness, this apperception is taken as immediate and veridical, yielding to those with sufficient training and experience direct insight into the nature of deep phenomenology. This direct experience and insight is taken by some to constitute the foundation of a contemplative science of mind. (Wallace 2008, 2009b) Science, after all, relies upon observation using the best available instruments. If the minds of meditators are the best available instruments for studying the mind, trained introspection amounts to science.

Of course insight into deep phenomenology is important, for understanding the fundamental nature of the self and our subjectivity is central to the project of overcoming primal confusion regarding the nature of reality, as well as the project of cultivating moral perfection, and so central to the elimination of both classes of obstacles to full awakening. Buddhist practitioners and cognitive scientists hence share an important goal—understanding the most fundamental cognitive processes that constitute and enable our ordinary consciousness. But can the meditation cushion really replace, or even supplement in a meaningful way, the laboratory? Might the results of meditation suggest alternative practice in the laboratory? Or might it be instead that science suggests alternative practice on the cushion?

Prior to all of these questions is a meta-question about questions concerning consciousness. Most (but not all) Buddhists share with some (but certainly not all) cognitive scientists and some (but not all) phenomenologists a tendency to think of consciousness as a kind of *thing,* or at least as a discrete *property.* We can then ask how many there are (6, 7, 8…?), whether they are physical or not, what the neural correlates of it are, whether machines can have it, etc… These questions may or may not be interesting, and may or may not have answers. But they share a common presupposition insufficiently interrogated in either tradition, viz., that there *is* something called 'consciousness,' '*jñāna,*' '*shes pa,*' *etc*... about which these questions can meaningfully be asked.

To be sure, we are conscious of things, and to be sure, we are conscious of different things, or the same things in different circumstances, in very different ways; and to be sure, there is all the difference in the world between being unconscious *tout court* and

conscious at all. But that hardly entails that there is some*thing* called consciousness, a unique, homogeneous mechanism, or even that there is a *discrete property* of being conscious. The distinction between surface and deep phenomenology brings this fact out well. To be able to report on an object of experience is one way of being conscious of it, whether the object of consciousness is internal or external. To respond differentially to a stimulus, whether reportable or not, is yet another way of being conscious of it. Sensory consciousness is one class of processes, but processes of this class may be very different from those involving memory or abstract thought. And most of all, to think that any cognitive process or state is self-presenting, immediately accessible and an object of necessarily veridical apperception is manifestly, demonstrably false, as illusions of perception, attention and memory (e.g. the Loftus effect or the colour phi phenomenon) show.

The fact that consciousness is neither a unitary phenomenon nor is immediately available to introspection, or even to introspection supplemented by *a priori* reflection means that deep phenomenology as an enterprise is essential to understanding ourselves. This is because this complex of non-introspectible psychological/neurological processes that conditions so much of our surface phenomenology and drives so much of our behaviour; it also means that deep phenomenology is *hard*. It requires us to use techniques of examination that rely on theory and experiment, not simple observation, however sophisticated that observation may be, or however difficult it may be to cultivate it. The mind guards its secrets as jealously as any other natural phenomenon.

4. *Why Buddhism and Buddhist practice tell us so little about deep phenomenology*

The multiplicity of kinds of conscious experience, and the susceptibility of each to perceptual, apperceptual or cognitive illusion constitute insuperable obstacles to the pursuit of psychology through introspection, even to the pursuit of purely *phenomenological* psychology through introspection. These obstacles cannot even be surmounted by supplementing that reflection with Husserlian or Yogācārin transcendental reflection, any more than *a priori* reflection could by itself supplement observation in biology or chemistry. We have no reason to believe that experienced meditators are immune to inattentional blindness, to the Loftus effect, or that the monochromicity of their peripheral vision is available to them (and Khalsa et al. *op. cit.*

give us good reason to believe that they are not).[5] Moreover, none of these effects, each demonstrable in the undergraduate laboratory, are reported in thousands of years of meditative experience or could be deduced *a priori* from immediate data of experience.

It would be foolish to reply that the reason for this is that these phenomena are soteriologically irrelevant. Nothing could be further from the case. Attention is a kind of mindfulness, and Buddhist meditational theory and soteriological theory emphasizes the need to train attention as a vehicle for epistemological as well as moral development. The psychological nature and epistemic status of perception and memory occupy a great deal of Dharmakīrti's attention, and for good reason: perception is our fundamental mode of access to the empirical world, both internal and external; and memory is central to the debate about *svasaṃvedanā,* which in turn is fundamental to many Buddhist debates about the nature and status of self-understanding in general. The status of *yogapratyakṣa* as a *praṁāna* hinges on the transparency of consciousness to this kind of perception, and so on.

Moreover, illusions or failures of attention, memory and perception have definite consequences. They always represent a kind of *avidya,* and they often cause demonstrable additional suffering. It is important if not to eradicate them, to become aware of their dimensions and to work to ameliorate their effects. We simply have to acknowledge that with respect to many phenomena central to its principal domain of concern, Buddhist practice and theory has not been entirely successful. While cognitive science may tell us something about how Buddhist practice produces its effects, and may even confirm its claims to produce surprising effects, it would be foolish for cognitive science to rely on Buddhist meditation as a substitute for controlled experiments as a source of evidence or to rely on Buddhist theory as a substitute for well-confirmed cognitive or brain theory as an explanation of *how* it produces those effects.

To put this point another way, deep phenomenology to be sure, requires the kind of careful phenomenological reflection and

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[5] Of course, the Khalsa finding is but one data point. Davidon (personal communication) reports that at least two experienced meditators appear to demonstrate less inattentional blindness than typical subjects. But this has yet to be demonstrated experimentally. It might be that further research shows that meditators are indeed relative immune to perceptual and cognitive illusion. But this has not been established to date. And even if it were to be demonstrated, this would not show that the prevalence of these illusions or their cognitive or neurological basis could be discovered by meditation.

introspection in which Buddhist meditators (among others, of course) are trained. But that kind of reflection, while necessary, is insufficient to yield deep results. That is where experiment, neuroimaging, and the theoretical resources they bring to the table come into play.

5. *What cognitive science offers to Buddhism in deep phenomenology*

So far, I have been damping expectations regarding the contributions of Buddhist practice and theory to the enterprise of deep phenomenology. But this is not to deny that there is real scope for collaboration between experienced Buddhist meditators, scholars of Buddhist theories of mind and cognitive scientists, nor to deny that the domain of cognitive phenomenology is the appropriate venue for that collaboration. It is instead to suggest that the principal direction of traffic might be different from that generally supposed by boosters of these collaborations. Cognitive science may have more to contribute to Buddhism than the other way around. (This is *not,* however, to claim that this is a one-way street. I will close with speculations about where the most valuable contributions of Buddhism to psychology might be found.)

Buddhist practice is committed to an understanding of the nature of mind and experience, and its transcendental phenomenological reflection, as pursued in the Yogācāra tradition, as well as in the advanced meditation traditions such as Mahāmudra and rDzog chen, as well as the introspective deliverances of meditators in these traditions, are significant contributions to our understanding of our inner lives. But, as I have indicated, the Buddhist project of insight into the nature of mind for the purpose of the alleviation of suffering requires more than such reflection can deliver on its own. Moreover, the naturalism that permeates Buddhist theory—that is, the commitment to an empirical understanding of causal processes—as well as its epistemological commitment to accepting the deliverances of perception and inference (including, one must suppose, observation and theory developed by those in white coats as well as those in saffron or maroon robes) commits Buddhist theorists of mind to attend to contemporary scientific results concerning the mind. This commitment, I am pleased to say, that is honoured more and more frequently, largely as a consequence of HH the Dalai Lama's commitment to dialogue with science, but also as part and parcel of Buddhism's more general engagement with modernity, and the consequent increasing familiarity of Buddhist scholars and practitioners with science.

Let me just indicate by example how this might go. Consider how we might adumbrate the Yogācāra insight that the world we inhabit is fundamentally *paratantra-svabhāva,* but is experienced by us in its aspect of *parikalpita-svabhāva.* The idea here is that our *lebenswelt* is not delivered to us pre-packaged independent of the nature of our consciousness and our cognitive capacities, but is entirely dependent upon them for its construction and significance. On the other hand, pre-reflective awareness does not deliver that dependency, but superimposes an imagined independence, the illusion of a transcendent existence that is merely captured by passive subjectivity. This Yogācāra analysis of experience, developed by Vasubandhu among others, is the result of a combination of sharp introspection and transcendental phenomenological reduction. It is an excellent point of departure for a deep phenomenology.

But it is only a point of departure. We cannot determine by Yogācāra analysis alone *how* that superimposition is accomplished, and what causal processes mediate the interaction of the sensory system with distal objects to generate the experienced world. We must, if we are intellectually honest, turn to modern cognitive science to take us to these depths. The laboratory can help to tell us both that and how the illusion is created, in virtue of what kinds of perceptual and cognitive processes the world we inhabit is dependent upon us, and how those processes are implemented in the nervous system. (Ironically, but profoundly, it also tells us that this illusion afflicts apperceptive consciousness as well, confirming not the self-luminosity, but the self-opacity of consciousness, a point appreciated by such critical exegetes as Tsongkhapa.)

We find out through careful empirical investigation how colour is assigned to the periphery; how blind spots are filled; how the illusion of constancy is maintained, and how attention operates at a preconscious level to determine what arises to introspectibility. The details and the extent of the illusion that constitutes our perceived world will forever elude introspection because they lie too deep for the light of introspective awareness to penetrate. Nonetheless, it is necessary to understand these details in order to understand how our surface consciousness arises. This understanding is revealed only through experiment; over two thousand years of serious practice left them unknown; less than a century of experiment has disclosed them.

All of this has relevance for *pramāṇa* theory as well. Classical Buddhist epistemology draws a sharp line between perception and inference, and holds perception always to be the veridical apprehension of particulars. Neither of these theses is tenable, if we take empirical

results seriously. Perception, we learn from empirical research, is never immediate, and never devoid of inferential processes. It is guided by attention and pretension, mediated by memory and low-level inference. To isolate the bare sensory information at the lowest level is not to identify *real* perception purified of contaminated cognitive processes, as perhaps one might hope were one desperate to salvage Dharmakīrti's epistemology; it is only to identify the pre-cognitive, non-epistemic stimulation of sensory receptor cells. Those processes are a long way from anything plausibly perceptual. At any level of processing at which even basic sensory qualities are available to cognition, much that Buddhists would regard as conceptual has entered the processing picture.

This also means that to the extent that perception delivers us its objects—however simple and unrecognized they may be—as objects of experience, as opposed to as constructions of mind, perception is deceptive, and the result of imperfectly engineered apparatus resulting from the satisficing processes of evolution modulated by the slings and arrows of everyday life, just like any other cognitive process. This deception is already implicated in the fundamental confusion that is the result of suffering. Adopting a more fallibilist epistemology with a more nuanced understanding of the perceptual process will thus add depth both to Buddhist theory and practice. *Yogapratyakṣa* is not immune from this. Our introspective awareness of our cognitive processes, no matter how sophisticated, is as constructed, and hence as fallible as any other perception.

And of course all of this has implications for the debate regarding *svasvaṃvedanā*, or the question regarding the intrinsically apperceptive character of consciousness. Much Western phenomenology, from Husserl down to Zahavi and Gallagher (2008), like Buddhist Yogācāra, endorses this pervasiveness of pre-reflective self-consciousness. Many Western empiricists, joined by many Buddhist Mādhyamikas, reject it. The jury may be out here, but I believe that the preponderance of evidence still lies with the Mādhyamikas and empiricists. The opacity of our own contribution to our own phenomenology undermines *svasaṃvednā* at both the surface and deep levels. At the surface level, too much of our ordinary processing goes on without our even being aware of it, as the phenomenon of autopilot demonstrates. At the deep level, too much of our consciousness is so primordial, so automated, that it is not even introspectible. To talk of self-consciousness at that level, a level at which even to talk about consciousness is stretched, stretches the meaning of 'self-consciousness' to the point of emptiness—in the pejorative, not the metaphysical, sense of that term.

6. *Buddhism and moral psychology: A real contribution*

So far, I have been heretically emphasizing the degree to which Buddhism can learn from cognitive science, and the degree to which its own internal imperatives compel it to do so. But that is only one lane of a two-way street. There is a domain in which Buddhism probably has a great deal to contribute to cognitive science, one in which arguably Buddhist insight is well in advance of contemporary theory in the West, and that is moral psychology. Buddhist ethics has always been grounded in a sophisticated moral phenomenology, connecting suffering and vice to attachment and aversion, those to deep confusion about the fundamental nature of reality and in particular the self and subjectivity, and these in turn to deep primal fear.

Moral progress in turn has been understood as a transformation of one's comportment toward the world, comprising both a transformation of moral and metaphysical vision and an elimination of the profound fear of death, enabling our pervasive subconscious awareness of impermanence to become a source of joy and compassion rather than a source of fear and grasping. (Garfield 2009 and in press, Finnigan and Tanaka 2010) The phenomenological reflection that underlies this moral psychology as well as the recommendations it entails for moral development, involve both deep introspective engagement and a powerful transcendental reflection on what we have come to know as *dasein* and *mitsein.* While aspects of these insights have emerged in the West, principally in the work of Freud, and more recently in the discipline of cognitive behaviour therapy, there is little either in ethical theory or in the psychology of ethical thought and action that approaches Buddhist ideas, particularly as articulated by such philosophers as Śāntideva, in sophistication.

Buddhist reflection indicates to us the ways that our perception of ourselves, of those around us, and of the world of animate and inanimate objects to which we relate is conditioned by ideology and by affect. It also indicates the plasticity of that perception, of our preconscious ideology and of our affect, albeit also the difficulty of exploiting the plasticity in daily life. And it holds open the prospect that the application of a cognitive understanding of the fundamental nature of reality, including the pervasiveness of impermanence and interdependence, and of the technique of mindfulness can effect the transformation that takes us from fear into contentment, and from egocentric misery into altruistic joy.

This is, of course, the burgeoning science of positive psychology and of ethical development, science that may succeed in redrawing of the map of the domain of moral experience, motivation and action through empirical investigation. And this investigation is has been and will continue to be theoretically and clinically fecund. It involves straightforward experimental and imaging paradigms of the kind used to examine motivation, affect, perception and moral reasoning already, turning our gaze on phenomena such as fear vs equanimity, egoism vs altruism, compassion vs indifference and their connection to the perception of independence vs interdependence, permanence vs impermanence, etc. Not rocket science, but potentially more valuable to humankind than much that is. And a domain in which Buddhist *theory,* as well as practice, has much to contribute to contemporary cognitive science.

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