

The dependent arising of a cognitive unconscious in Buddhism and science

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There is a growing consensus in Western thought and science that we may understand ourselves and our world more deeply if we think in terms of patterns of relationships rather than of reified essences or independent entities—if we think, that is, in the traditional Buddhist terms of dependent arising. This essay explores some of the common ground between these two perspectives by focusing upon two core Buddhist concepts, the dependent arising of our ‘world of experience’, and the notion of *viññāna*, ‘discerning cognitive awareness’ or simply ‘consciousness’, ultimately arriving at its most important development in the *Yogācāra* school of Indian Buddhism, the *ālaya-viññāna*, a form of subliminal cognitive awareness or ‘unconscious structuring of the world’. We will draw upon ideas from such modern fields as general systems theory, evolutionary biology and cognitive science in order to elucidate these ancient Buddhist notions, resulting in provocatively different, yet to my mind more evocatively contemporary, interpretations of key Buddhist concepts. Rather than pursue a simple point-by-point comparison between these traditions, however, we shall seek to invoke their commonalities by engaging in an inductive, almost phenomenological inquiry into the arising of ‘the world of experience’ without an experiencer.

To anticipate both the structure and argument of this essay, we will focus on a number of areas where Indian Buddhist thought constructively converges with current trends in scientific approaches to mind. They both focus upon patterns of dependent relationships rather than on actions of independent entities; within which cognitive awareness (*viññāna*) is understood as a process that arises by depending upon conditions, rather than a faculty that operates by acting upon objects. Such cognitive awareness arises as an awareness of differences within a correlative cognitive domain, rather than as a perception of objects within a pre-existing external world. These cognitive domains, moreover, are thought to have arisen through processes of circular causality (feedback systems), which were in large part brought about by those very discernments of difference. And such discernments are thought to arise, in part, through unconscious processes pre-formed by linguistic classifications, rather than through conscious processes performing rational procedures.

This ‘linguistification’ of human mental processes gives rise in turn to a symbolic self, which is dependent upon the reflexive possibilities of language usage rather than reflective of the existence of substantive souls. And finally,

the notion of a 'cognitive unconscious' epitomizes all of the aforementioned points: it develops through evolutionary processes of circular causality, which give rise to forms of awareness without an experiencing subject, by means of which our 'world of experience' is continuously yet unconsciously constructed, classified, and mapped. This unconscious structuring of experience, both perspectives submit, imparts the cogency of human experience, with its deep sense of subjective coherence, without relying upon essential or substantive causal agents, either external or internal. In this way, at least some Buddhist thinkers and some modern scientists have reached some accord in ways to think about 'Thoughts without a Thinker'.

The 'dependent arising of the world' as phenomenology of experience

Indian Buddhists observed that we can best understand complex causality—how things come to be—by understanding the systemic relations in which they are involved and the patterns of dependence upon which they arise; that is, by understanding their 'dependent arising'. As we shall see, this formula subsequently became the basis for a Buddhist model of circular causality wherein certain specified patterns of conditions continuously feedback upon themselves, reinforcing their own evolutionary processes.

The classical Indian Buddhist conception of causality¹ is singularly expressed in this simple formula of dependent arising:

When this is, that comes to be; with the arising of this, that arises. When this is not, that does not come to be; with the cessation of this, that ceases. (M II 32, etc.)

One of the most important implications of this model is that it dispenses with the notion of fixed entities or unchanging essences altogether. Instead of asking how independent entities act within or upon an objective world, the view of dependent arising asks 'under what conditions does such and such a phenomenon arise?' or, more elaborately, 'what various complex conditions interact in what recurrently patterned ways in order to routinely give rise to what kind of phenomena?'.²

In other words, our attention shifts away from a concern with independent agents acting on independent objects, the entrenched grammatical syntax of conventional language,³ and towards an investigation of the complex, processual and interactive arising of things. But this requires focusing upon patterns of arising rather than on agents of action—and patterns are relational, not substantive, and arising is dynamic, not static.⁴ The Buddhist dismissal of selves, essences or unchanging entities, therefore, derives not so much from logical propositions or first principles, such as 'all is change', as much as it follows from the nature of its questions: 'how do things come to be?'—a point that is all the more obvious by a similar disavowal of essences,⁵ entities or substantive selves⁶ in modern science.

This is the conceptual framework, the causal syntax if you will, within which most early Buddhist analyses of mind took place. It is an attempt to describe and understand experience as it arises. It is, in a word, a phenomenology of consciousness.

The dependent arising of cognitive awareness

This is well exemplified in the concept of *vijñāna* (P. *viññāṇa*), ‘cognitive awareness’ or ‘consciousness’, the central-most concept in Buddhist analysis of mind. Although the Buddha⁷ declared that in general ‘Apart from conditions, there is no arising of cognitive awareness’ (M I 258), each specific form of cognitive awareness arises in conjunction with particular factors; for example, ‘Visual cognitive awareness arises dependent on the eye and (visual) form’ (S II 73). That is, a moment of cognitive awareness (*vijñāna*) arises⁸ when an object appears in a sense field, impinging upon its respective sense organ. Sense object and sense organ (or faculty) are thus correlatively defined, for a visual object is, by definition, the kind of stimulus that can impinge upon an eye.

Although it is common to speak of cognitive awareness as if it actively cognizes objects, in the syntax of dependent arising cognitive awareness does not actually *cognize* anything—it simply *is* the awareness that arises when the requisite conditions come together.⁹ Vasubandhu, author of the fifth-century *Abhidharma-kośa*, makes precisely this point:

The sūtra teaches: ‘By reason of the organ of sight and of visible matter there arises the visual consciousness’: there is not there either an organ that sees, or visible matter that is seen; there is not there any action of seeing, nor any agent that sees; this is only a play of cause and effect. In the light of [common] practice, one speaks, metaphorically, of this process: ‘The eye sees, and the consciousness discerns.’ But one should not cling to these metaphors. (AKBh, Pruden 1988, 118)¹⁰

In other words, to interpret *vijñāna* as an act of cognition rather than an occurrence of awareness is to ignore the syntax of dependent arising, which takes no active subject. Once again, the traditional Buddhist denial of a substantive, unchanging entity may be seen as less a metaphysical position than a function of its mode of analysis.¹¹

Cognition, in these terms, is thus neither purely subjective nor wholly objective. Like a transaction that takes place between individuals, cognitive awareness occurs at the interface, the concomitance of a sense organ and its correlative stimulus. Cognitive awareness is thus neither an exact ‘mirror of nature’ that reflects things ‘as they are’—since what constitutes an ‘object’ is necessarily defined by the capacities of a particular sense organ—nor is it a unilateral projection of *a priori* categories—since the cognitive capacities of a sense organ are similarly defined by the kinds of stimuli that may impinge upon them.¹² This entails a number of far-reaching implications, for discerning cognitive awareness is not only an event that occurs temporally, but one that equally depends upon relational distinctions—and relational distinctions, it should be clear, are hardly substances.

The dependent arising of awareness (*vijñāna*) of difference

Perception operates only on difference. All receipt of information is necessarily the receipt of news of *difference*. (Bateson 1979, 31)

In his popular book *Mind and Nature*, Bateson (1979, 120–1) compares cognitive processes with a simple electric switch:

the switch, considered as a part of an electric circuit, *does not exist* when it is in the on position. From the point of view of the circuit, it is not different from the conducting wire which leads to it and the wire which leads away from it. It is merely ‘more conductor’. Conversely, but similarly, when the switch is off, it does not exist from the point of view of the circuit. It is nothing, a gap between two conductors which themselves exist only as conductors when the switch is on. In other words, the switch is *not* except at the moments of its change of setting, and the concept ‘switch’ has thus a special relation to *time*. It is related to the notion ‘change’ rather than to the notion ‘object’.

The switch exists, as a switch, only at the moment of switching; otherwise it remains indistinguishable from the rest of the circuit. Our sense organs function similarly, Bateson avers: they only operate relative to, that is, are only triggered by, changes in stimuli, by events. Bateson is not simply parroting the ancient platitude that ‘everything changes’.¹³ Rather, he is suggesting the more fundamental notion that change is *constitutive* of perception itself. Hence, to even speak of perception is necessarily to speak of events—and this is to speak in terms of dependent arising.

Moreover, just as the switch does not exist, for the circuit, except while the switch is switching, so too *distinct* stimuli do not exist, for a cognitive system, except insofar as they also involve contextual differences. An absolutely isolated or absolutely camouflaged object would be imperceptible. This is not to say that ‘differences are perceived’ (which would abandon the syntax of dependent arising), but rather that such differences are constitutive of perception in the same way that change is. To even speak of perception, therefore, is necessarily to speak of contextual differences. Awareness of differences, however, does not arise outside of a context, since differences only occur *between* phenomena. Contextual differences, in other words, have no singular location. As Bateson (1979, 109) observes: ‘Difference, being of the nature of relationship, is not located in time or in space’. Since differences arise contextually rather than independently, and are episodic rather than enduring, they have no substantive existence. Not being substances, they neither come nor go anywhere.

These ideas suggest an interesting approach to the elusive notion of dharma in Abhidharma thought. Abhidharma represents a systematic attempt to analyze the arising of experience in terms of discrete factors, in terms of momentary¹⁴ and distinctive events called *dharmas*.¹⁵ A *dharma* refers, in other words, to each momentary and distinct aspect of experience insofar as it is understood as

a conditioning factor, a stimulus, in the arising of cognitive awareness. It follows, therefore, from the mode of analysis outlined earlier that these *dharmas* neither arise from anywhere nor go anywhere. That is, *dharmas* have no actual substance or any singular location; they are neither a ‘something’ nor a ‘nothing’, ontologically speaking.¹⁶

These are, of course, the same conclusions we drew from our analysis of perception, except that now they are reflexively applied to the systemic differentiations between the terms of analysis themselves. Abhidharma, in other words, is a ‘metapsychology’, which self-consciously ‘deals with the various concepts and categories of consciousness as the primary objects of investigation’ (Piatigorsky 1984, 8). Thus, while *dharmas* may ultimately refer to experiential phenomena, what *counts* as a *dharma* in any system of description must always be distinguished from other *dharmas*. *Dharmas* cannot therefore refer to independent, self-sufficient entities. Or rather, and more precisely, we cannot speak about the ‘true nature’ of a *dharma* outside of a given system of analysis.¹⁷

What can serve as a stimulus in the arising of cognitive awareness, moreover, is not merely correlative to our sense organs or faculties, but more deeply depends upon the implicit schemas that are enstructured into the way those organs and faculties operate. We cannot help but see something as red rather than blue, hearing pitches as high or low, feeling distinct textures or temperatures, or smelling odors odious or enticing. Since such distinctions are constitutive of cognitive awareness, the classifications they depend upon are also indispensable for the arising of any moment of discerning cognitive awareness (*vijñāna*). As cognitive scientists Lakoff and Johnson point out:

Categorization is ... a consequence of how we are embodied ... We categorize as we do because we have the brains and bodies we have and because we interact in the world the way we do ... What that means is that the categories we form are *part of our experience!* (1999, 18–19)¹⁸

Our cognitions and distinctions, and the implicit schemas that inform them, thus constitute and construct our ‘world’ of experience.

Circular causality brings forth a world: biology

Our capacities for such awareness of distinctions did not arise uncaused, nor are they without their own consequences. They developed in dependence upon previous kinds of experience and, in turn, condition the kinds of experience, the kinds of cognitive awareness, that may arise in the future. The momentary arising of an awareness of differences is thus embedded in a larger feedback cycle in which ‘the effects of differences are to be regarded as transforms of the difference which preceded them’ (Bateson 1979, 121) These two inter-related notions—circular causality, in the form of recursive feedback processes; and epigenesis, the process wherein the results of previous events serve as the basis for succeeding ones—provide another important arena where Buddhist philoso-

phy has much in common with scientific models of causality, particularly those of cognitive science and evolutionary biology.

Stimuli are always impinging upon the sense organs, giving rise to forms of cognitive awareness, however subtle; and these processes continuously but subtly modulate the structures of these organs, which in turn influences their receptivity to subsequent stimuli.¹⁹ These two processes—that living itself entails continuous moments of cognitive awareness and that cognitive awareness entails continuous modification of living structure—illustrate the reciprocal causal relation between the structure of sense organs and the arising of cognitive awareness. These reciprocal processes, however, not only occur at the micro level of cognition, but also at the macro level of evolution. Both evolutionary biology and the view of dependent arising also articulate models of circular causality in order to describe how things come into being over the long term through the recursive, accumulative processes of feedback causality.²⁰

This implies, in the biological view, that the very minds and bodies we embody today reflect the gradually accumulated results of reproductively successful interactions between our forebears and their natural and social environments. As with our analysis of cognitive awareness, evolutionary theory here shifts our attention from the arising of entities to the recurrent patterns of interaction. ‘What evolves’, biological philosophers Maturana and Varela observe, ‘is always a unit of interactions’ (1980, 12), neither the organism by itself, and certainly not the environment alone, but rather the organism-in-environment. In other words, it is *patterns of interaction* that evolve,²¹ representing for each species an ‘evolution of [its] cognitive domains’.²² And, similarly and reciprocally, the evolution of its cognitive domain is the evolution of the ‘world’—for that kind of organism—a process Maturana and Varela call a ‘structural coupling with the world’.

What constitutes the ‘world’ or ‘environment’ for any given organism, therefore, depends upon these evolved cognitive structures. We cannot speak of an independent, objective world that organisms have access to, because ‘the domain of classes of interactions into which an organism can enter *constitute its entire cognitive reality*’ (Maturana and Varela 1980, 10f; emphasis added). To even speak of a ‘world’, therefore, is necessarily to speak of a cognizing, that is, an interacting, organism. In this sense, and consonant with the view of dependent arising, ‘world and perceiver specify each other’ (Varela *et al.* 1991, 172)—both synchronically, from moment to moment, as well as diachronically, over the life and lifetimes of individuals and species.

Circular causality brings forth a world: Buddhism

We may now more fully appreciate some of the implications of the formula of dependent arising, whose cyclic nature warranted the appellation *saṃsāra*, literally ‘the going around’. The series of dependent arising depicts recursively cyclic patterns of interaction between the constructed complexes

(*saṃskāra*), cognitive awareness (*vijñāna*), and the constructive afflicted actions these both enable and elicit. For as long as the cognitive processes give rise to sensation (*sparśa*) and feeling (*vedanā*), then craving (*trṣṇa*) and grasping (*upadāna*) will tend to arise, which in turn tend to elicit the intentional afflicted activities, the karma, that ultimately shape and sustain the structures (*saṃskāra*) that perpetuate further existence—all of which constitutes the ‘arising of the world’ (S II 73).²³ And for as long as these structures persist, they provide the conditions that both enable and conduce to further cognitive and afflictive processes, and so on. This model of circular causality—enabling structures that give rise to cognitive awareness, which in turn elicit the afflictions that instigate actions which reinforce those very structures, and so on—is, we submit, the core of the non-Mahāyāna Buddhist world view.²⁴

Evolutionary biology and Buddhist thought thus both analyze the causal relations underlying momentary cognitive processes and long-term evolutionary processes in a similar fashion:²⁵ the ‘arising of the world’ for an individual, its ontogeny, as well as, for a species, its phylogeny,²⁶ can be equally well understood as the evolution of specific cognitive domains out of the dynamic vortex of cyclic causality.

Since the recurrent interactions between cognitive awareness and its enabling structures, which entail continuous modification of these structures, are causally effective at either a developmental or evolutionary scale, it follows that the particular implicit and innate classificatory systems that condition cognitive awareness *themselves* become important factors in the further development of living structures (*saṃskāra*); that is, they impart causal influences upon human evolution in their own right. Living forms have, in effect, ‘enstructured’ their cognitive maps, their capacities for cognitive discernment, through the extended epigenetic processes of circular causality. This is true at the individual level, in our neural pathways, for example, as well as at the species level, as in evolutionary theory.

But classifications, we remember, refer to patterns of relationships not properties of substances, to maps not territory. That is to say, the distinctions that constitute our cognitive schemas—which have no spatial location and come from nowhere and go nowhere—are indispensable conditions for the dependent arising of our minds *and* bodies. In Buddhist terms, the *dharmas* that give rise to discerning cognitive awareness are constitutive conditions for ‘the arising of the world’ not just epistemologically, which is obvious, but ontologically as well. In other words, there would be no distinctively human *embodiment* without the classifications and categorizations constitutive of the arising of cognitive awareness itself.

And what is our most important source of human categorization and classification, whose distinctions have no spatial location either inside or outside of our brains,²⁷ and is, furthermore, one of the most salient features of our physical and mental structures? Language. It appears that we embody not only the results of what we have thought, felt and done, but, in addition, of what we have heard and said. We are, in short, the word become flesh.

Cognitive awareness arising from consensual communication

Our linguistic capabilities did not, of course, spring fully formed from the head of Zeus. They too resulted from the accumulative, constructive and circular processes of evolution whereby cognitive processes condition living structures, which in turn condition further cognitive processes, and so on.²⁸ As linguistic, symbolic communication ‘dependently arose’ in early hominids it became a powerful evolutionary force in its own right, radically and irrevocably changing the structures and processes of the human brain.²⁹ This momentous change centered on an increasingly enlarging prefrontal cortex, where such symbolizing processes apparently occur.³⁰ As language use and ‘prefrontalization’ mutually reinforced each other, the symbolic-linguistic mode of cognition that depends upon them came to dominate other, originally non-linguistic, processes. In other words, human cognitive processes, even simple sensory ones, unavoidably arise in dependence upon our ‘linguistified’ brain. Language, then, along with the systemic distinctions that constitute it, is not something added on to human cognitive processes. Systemic symbolic thinking is *constitutive* of normal human cognitive processes.³¹

This prefrontalization of human cognition, however, is fraught with unintended consequences, consequences that follow from the very nature of linguistic symbolification: language gives rise to its own feedback cycles. Not only can we not ‘help but see the world in symbolic categorical terms’, according to neurophysiologist Deacon (1997, 416), ‘dividing it up according to opposed features, and organizing our lives according to themes and narratives.’ But, he ominously notes, ‘[S]ymbolically mediated models of things ... exhibit complicated nonlinearity and recursive structure as well as nearly infinite flexibility and capacity for novelty due to their combinatorial nature’ (Deacon 1997, 434). This linguistification of human cognitive processes, in other words, represents a physiologically enstructured, predominating cognitive strategy characterized by compulsive yet creative recursivity, based upon words that are defined disjunctively and systemically, not independently or substantively, and whose meanings are merely conventionally determined. No wonder Deacon ambivalently observes (1997, 436): ‘we are not just a species that uses symbols. The symbolic universe has ensnared us in an inescapable web’.³²

Buddhist analysis of mind also connects reflexivity, and the linguistic categorizations it depends upon, with cognitive processes (*viññāna*) that have been built up through the accumulating, epigenetic cycles of dependent arising. In this view, cognitive reflexivity and recursivity also depend upon the reciprocal relationships between sensory cognitive awareness, non-sensory (symbolic) objects such as thoughts or ideas, and the ensnaring web of conceptual proliferation (S. *papañca*, P. *papañca*) entailed by language use:

Dependent on the eye and forms, eye-consciousness arises. The meeting of the three is contact. With contact as condition there is feeling. What one feels, that one apperceives. What one apperceives, that one thinks about. What one thinks about, that one mentally proliferates. With what one has mentally proliferated as the source, apperceptions and notions

tinged by mental proliferation [*papañca-saññā-sankhā*] beset a man with respect to past, future, and present forms cognizable through the eye ... mind-objects cognizable through the mind. (M I 111f) (Ñāṇamoli 1995, 203)³³

The most deeply entrenched locus of these recursive possibilities, which also doubles back to instigate its own linguistically generated recursivity, is no doubt our sense of self as an enduring, experiencing agent. As one Pāli text declares, ‘the notion “I am” is a proliferation; “I am this” is a proliferation; “I shall be” is a proliferation’ (S IV 202f). The very thought ‘I am’ is, according to the Sutta-nipāta, the root (*mūla*) of proliferation itself.³⁴ In short, as long as the thought ‘I am’ persists, so long will endless cycles of apperceptions, conceptual proliferation and further apperceptions, and so on, keep spinning.

This sense of self, however, derives its compelling cogency, its enduring and endearing allure,³⁵ from the same social and linguistic matrix that other words and symbols do: symbolic representation.³⁶ Like language, this symbolic self is a product of massive interdependency; like other relational phenomenon, it has no substantive existence in time or space. ‘It is a final irony’, Deacon concludes:

that it is the virtual, not actual, reference that symbols provide, which gives rise to this experience of self. The most undeniably real experience is a *virtual* reality ... its virtual nature notwithstanding, it is the symbolic realm of consciousness that we most identify with and from which our sense of agency and self-control originate. (1997, 452; original emphasis)

The cognitive unconscious as embodied structuring of experience

Language and the symbolic self that language enables are also both complex products of interdependent processes that have, like habits, become enstructured into our underlying physiological and psychological structures. As Deacon observes (1997, 456), ‘It is the goal of most cognitive processes to make information processing unconscious and automatic—as quick, easy, and efficient as possible’. We may distinguish, therefore, between the immediate but intermittent processes of discerning cognitive awareness accompanied by attention, and the underlying but continuous processes operating automatically. This distinction was intimated in two distinct formulas for the arising of cognitive awareness in early Indian Buddhism:

Depending on eye and forms visual cognitive awareness arises. (S II 73)
Depending on *sankhāra* (*saṃskāra*) cognitive awareness arises. (S II 2)

It was not until the Yogācāra school (circa second to seventh century CE), however, that forms of supraliminal cognitive awareness (*pravṛtti-vijñāna*), which arise in conjunction with present stimuli accompanied by attention, were explicitly distinguished from forms of subliminal cognitive awareness, which arise in conjunction with enduring structures (*saṃskāra*)—these latter being

subsumed under the term *ālaya-vijñāna* (roughly ‘store-house’ consciousness).³⁷ This Buddhist ‘cognitive unconscious,’ however, is no more an experiencer, agent or enduring subject than was cognitive awareness in the earlier model. It preserves all the qualities and qualifications mentioned earlier: ‘it is related to the notion “change” rather than to the notion “object” ... admit[ing] only news of difference’ (Bateson 1979, 121), it evolves through the accumulating, epigenetic processes of cyclic causality, and it gives rise to cognitive domains which constitute a specific cognitive reality, a dependently arisen ‘world of experience’. According to the *Samdhinirmocana Sūtra*, this form of subliminal cognitive awareness is such that:

the mind with all the seeds (i.e., the *ālaya-vijñāna*) matures, congeals, grows, develops, and increases³⁸ based upon the two-fold substratum³⁹ (or: appropriation, *upadāna*); that is, (1) the substratum of the material sense-faculties along with their supports (*sādhiṣṭhāna-rūpendriya-upādāna*), (2) and the substratum which consists of the predispositions toward conceptual proliferation in terms of conventional usage of images, names, and conceptualizations.⁴⁰

That is, subliminal cognitive awareness (*ālaya-vijñāna*) continuously arises in conjunction with (1) the living sense-faculties, and (2) the predispositions instilled by past linguistic experience, conceptualization, naming, and so on, defining as its specific cognitive domain an ‘external world’ which, however, remains outside of immediate awareness.⁴¹ We live, that is, in a ‘world’ whose predominant structuring influences—linguistic and physiological structures built up over time through extended organism–environment interaction—we cannot fully discern. And this is, if I am not mistaken, nearly exactly the current notion of the ‘cognitive unconscious’ (Lakoff and Johnson 1999, 9–15).

This model provides a way of articulating the continuous, simultaneous and mutually reinforcing relationship that occurs between subliminal and supraliminal cognitive processes in all ordinary human activities. On the one hand, all supraliminal cognitive processes are said to arise simultaneously with and based upon subliminal cognitive awareness (*ālaya-vijñāna*),⁴² which is itself continuously and simultaneously informed by the classifications constituting the predispositions (*vāsanā*) toward conceptual proliferation, etc. On the other hand, the arising of supraliminal cognitive awareness also continuously entails modulations or transformations of the forms of unconscious cognitive awareness themselves, implanting ‘seeds’ (*bīja*) or impressions (*vāsanā*) as the texts say.⁴³ These reciprocally reinforcing and gradually accumulating processes take place not only simultaneously, ceaselessly and mostly automatically, but also, in large part, unconsciously.

Since linguistic categories and classifications underlie all forms of cognitive awareness, subliminal as well as supraliminal, then they too are susceptible to the same conceptual prolixity, the same ensnaring recursivity that all language entails, which is now understood to occur at unconscious levels as well. Concurrently, our sense of self—enabled by and arising out of the reflexivity of linguistic representation—is also seen to have become so deeply enstructured

that it too occurs *unconsciously and automatically* in nearly every moment of mind.⁴⁴

And since such systemic classifications underlie all our cognitive processes, and have therefore informed and instigated nearly all the intentional activities that have, in the long term, been instrumental in shaping human evolution, it therefore follows that our linguistically based symbolic self, unconsciously embedded and virtually real, has also played an instrumental role in the coming to be of our entire *world of experience*. The symbolic self, in other words, although generated out of the vortex of the linguistic recursivity underlying all cognitive processes, from the unconscious on up, has effected compelling causal efficacy in its own right.⁴⁵ And this is true both within a single lifetime, that is, ontogenetically, as well as in the traditional Buddhist conception of multiple lifetimes, that is, (after a fashion) phylogenetically.

The cognitive unconscious as generative matrix of our 'common world'

We live our lives in this shared virtual world ... The doorway into this virtual world was opened to us alone by the evolution of language. (Deacon 1997, 22)

How is it that our experience collectively gives rise to our *shared* world of experience? We live in this 'shared virtual world', as Deacon puts it, in large part because 'the evolution of symbolic communication ... created a mode of extrabiological inheritance ... [that] is intrinsically social' (1997, 409f), one that evolved 'neither inside nor outside brains, but at the interface where cultural evolutionary processes affect biological evolutionary processes' (Deacon 1997, 409f). That is, we have similar kinds of cognitive processes because their supporting structures developed historically through continuous interaction with other human beings, giving rise to our common bodily forms, with our species-specific propensities toward cultural and social conditioning, and the predominating influences of linguistic classification, conceptualization, nominalization, and so on, through which we collectively yet unconsciously bring forth a shared world of experience.

With allowances for the issue of rebirth, this is largely compatible with mainstream views of causality in the Yogācāra tradition. As the commentary to *Mahāyāna-saṃgraha* (MSg I.60), explains:

[The statement:] 'The common [characteristic of the *ālaya-vijñāna*] is the seed of the receptacle-world' means that it is the cause (*kāraṇa-hetu*) of perceptions (*vijñapti*) which appear as the receptacle world. It is common because these perceptions appear similarly to all who experience them through the force of maturation (*vipāka*) that is in accordance with their own similar karma. (U 397c12f; u 267a8–268a1)

Our 'world'⁴⁶ appears to us in similar ways because we have similar karma to experience it similarly. It is language that provides the means through which the

‘common aspects’ of the *ālaya-vijñāna* give rise to a ‘common’ receptacle world. As a medium for sharing, conceiving and expressing experience, language provides the stimulus for similar kinds of cognitive processes to arise, processes that tend to provoke similar responses,⁴⁷ which, in turn, typically give rise to similar results. That is, actions that are informed and instigated by similar conditions and similar intentions give rise, over the long term, to a similar ‘world’.

And it is because our cognitive structures depend upon linguistic predispositions that cognitive awareness is always subject to language’s endless recursivity (*prapañca*). The ‘predispositions or impressions of speech’ (*abhilāpa-vāsanā*)—which are said to have the ‘special power’ (*śakti-viśeṣa*) of conventional expressions (*vyavahāra*) to give rise to cognitive awareness (*vijñāna*) in regard to expressions of selves (*ātman*), *dharmas*, and actions, and so on⁴⁸ (*ad MSg* I.58)—are never fully ‘used up’ (*anupabhukta*), *MSg* I.61.2 explains, because ‘the seeds of the impressions of language give rise to conceptual proliferation since beginningless time’. In other words, linguistic recursivity is the generative matrix from which endlessly springs forth the contents of our shared symbolic world, one that virtually supersedes the physical world we apparently inhabit.

The reciprocal feedback processes within which language is entwined thus operate on a variety of levels, not only synchronically—between the *ālaya-vijñāna* and supraliminal forms of cognitive awareness—but also diachronically, between our previous linguistic experience and our present proclivities conditioned by the ‘impressions’ of language. These operate both within a single lifetime and, in traditional Buddhist terms, over multiple lifetimes. But there is also a third, unconscious yet thoroughly intersubjective, feedback system, which, like the other two, continuously proliferates and perpetuates samsaric existence, but which, unlike them, bridges the individual and collective experience of the ‘world’, connecting our similar karmic activities with the similar ‘worlds’ these activities bring about.⁴⁹

Our shared world, then, dependent upon our shared species-specific cognitive structures, is ultimately inseparable from our shared cognitive awareness, dependent upon our shared linguistic, symbolic structures. As Deacon declares:

a person’s symbolic experience of consciousness ... is not within the head ... This [symbolic] self is indeed not bounded within a mind or body ... [it] is intersubjective in the most thoroughgoing sense of the term. (1997, 452f)

It is our common but unconscious habits of body, speech, and mind to which we are habituated that give rise, in the long term and in the aggregate, to the habitats we collectively inhabit. And, this, we suggest, is as true for some twentieth-century biologists and neuroscientists, as it was for fifth-century Yogācārin Buddhists.

Such perspectives serve to both clarify the nature of our alienation and bondage—our enchantment (there is no better word) with reified abstractions, such as genes, neurons, species, or selves—as well as to suggest paths beyond

such notions. For once we start thinking of organisms as complex dynamic organizations interacting in patterned relationships with their environments, our older, ultimately alienating, models of human beings as autonomous agents unilaterally acting on, or passively being acted upon, an independent, external and pre-existing world becomes limited at best and misleading at worst. The constructive power of these models comes not only from the idea that we can understand living processes better by understanding the patterns of interaction through which they arise, that is, their 'dependent arising', but also from the notion that we are collectively responsible for the world we continuously construct together. For if we are not really trapped inside our heads, but are causally as well as cognitively intersubjective through and through, then it matters indeed which particular concepts, categories and classifications we produce, proclaim and protect.

Notes

The author gratefully acknowledges permission to reproduce parts of 'Buddhist Steps to an Ecology of Mind: Thinking about "Thoughts without a Thinker"' (*Eastern Buddhist*, 2002, XXXIV, 1–51), from which this article is largely drawn.

- 1 This is, unavoidably, a generalization. There were numerous sects that often differed in their interpretations of dependent arising.
- 2 There are many passages in the Pāli texts such as the following: 'Who, now, Lord, is it who craves?'. 'Not a fit question', said the Exalted One. "I am not saying [someone] craves. If I were saying so, the question would be a fit one. But I am not saying so. And I not saying so, if you were to ask thus: 'Conditioned now by what, lord, is craving?' this were a fit question. And the fit answer there would be: 'Conditioned by feeling is craving.'" (S II 13).
- 3 'All our forms of speech are taken from ordinary, physical language and cannot be used in epistemology or phenomenology without casting a distorting light on their objects' (Wittgenstein *Philosophical Remarks*, §57; cited in Stern 1995, 12).
- 4 Since by definition essences do not change, they can have no obvious causal effect in the world of change; an unmoving billiard ball does cause another ball to move, only a moving one does. Essences are therefore metaphysical notions unrelated to the endeavor to understand causality in the phenomenal world. In slightly different terms, Wittgenstein (*Philosophical Investigations*, §271) suggests that 'a wheel that can be turned though nothing else moves with it, is not part of the mechanism'.
- 5 Gombich (1996, 1f) cites Karl Popper's remarks on the non-essentialism and nominalism of modern science: 'Popper, 1952, vol. II, p. 14): "the scientific view of the definition 'A puppy is a young dog' would be that it is an answer to the question 'What shall we call a young dog?' rather than an answer to the question 'What is a puppy?' (Questions like 'What is life?' or 'What is gravity?' do not play any role in science.) The scientific use of definitions ... may be called its *nominalist* interpretation, as opposed to its Aristotelian or *essentialist* interpretation. In modern science, only nominalist definitions occur, that is to say, shorthand symbols or labels are introduced in order to cut a long story short." Popper 1974:20: "... essentialism is mistaken in suggesting that definitions can add to our *knowledge of facts* ..." '.
- 6 Many, if not most, scientific works on brain and consciousness reject the notion of a 'unified, freely acting agent'. For example, brain scientist Richard Restak (1994, 111–21) argues: 'Brain research on consciousness carried out over the past two decades casts important doubts on our traditional ideas about the unity and indissolubility of our mental lives', particularly 'the concept of ourself as a unified, freely acting agent directing our behavior'. Lakoff and Johnson (1999, 268) state: 'The very

- way that we normally conceptualize our inner lives is inconsistent with what we know scientifically about the nature of mind. In our system for conceptualizing our inner lives, there is always a Subject that is the locus of reason and that metaphorically has an existence independent of the body. As we have seen, this contradicts the fundamental findings of cognitive science’.
- 7 There are serious historical questions concerning whether or to what extent the discourses preserved in the Pāli Canon represent the actual words of the Buddha. As these questions do not directly affect the import of this paper, we follow their traditional attribution to the Buddha.
 - 8 M I 190: ‘When internally the eye is intact and external forms come into its range and there is the corresponding engagement, then there is the manifestation of the corresponding class of consciousness’ (Ñāṇamoli 1995, 284).
 - 9 As Rahula (1959, 23) points out, ‘Consciousness does not recognize an object. It is only a sort of awareness — awareness of the presence of an object’. *Milinda’s Questions*: ‘Because there are vision here and material shape, sire, visual consciousness arises. Co-nascent with that are sensory impingement, feeling, perception, volition, one-pointedness, the life-principle, attention—thus these things are produced from a condition and no experiencer is got at here’ (Miln., 78).
 - 10 Buddhaghosa similarly states in the *Visuddhimagga* (XIX, 20): ‘He sees no doer over and above the doing, no experiencer of the result over and above the occurrence of the result. But he sees clearly with right understanding that the wise say “doer” when there is doing and “experiencer” when there is experiencing simply as a mode of common usage’.
 - 11 Wittgenstein’s attempt to forge a subjectless language entailed similar consequences: ‘It is because a language designed for the sole function of expressing everything that a subject might experience has no need for a term designating that subject that one cannot refer to the subject of experience from within the phenomenological language ... From within, one cannot individuate a subject at all. The metaphysical subject is not an object of experience, but a way of indicating the overall structure of experience ... The grammar of the phenomenological language ensures that all statements about experience are expressed in the same—ownerless—way’ (Stern 1995, 84).
 - 12 ‘Color concepts are “interactional”; they arise from the interactions of our bodies, our brains, the reflective properties of objects, and electromagnetic radiation. Colors are not objective; there is in the grass or the sky no greenness or blueness independent of retinas, color cones, neural circuitry, and brains. Nor are colors purely subjective; they are neither a figment of our imaginations nor spontaneous creations of our brains ... Rather, color is a function of the world and our biology interacting’ (Lakoff and Johnson 1999, 24–5).
 - 13 In his *Philosophical Remarks* §54, Wittgenstein (1975) makes the following remark: ‘What belongs to the essence of the world cannot be expressed by language. For this reason, it cannot say that all is in flux. Language can only say those things we can also imagine otherwise’. We take Stern’s (1995, 162) comments on this passage as admonitory qualification for many of the points that follow in this essay: ‘Like the solipsistic sayings, “the world is my world” and “only the present experience has reality”, Wittgenstein regards “all is in flux” as a philosophical pseudo-proposition, an attempt to say the unsayable ... But saying that we can’t imagine it being otherwise is to rule out the possibility that the proposition is false, and in so doing we also eliminate the connection between language and world that gives the proposition its sense’.
 - 14 The *Abhidharma-kośa* defines as momentary that which perishes immediately after its coming into being (AKBh IV ad 2b–3b; Shastri, 568; Poussin, 4). There was of course considerable disagreement as to what exactly constitutes a moment, whether it was divisible and so on. See, for example, *Kathāvatthu* XXII.8, the *Abhidhammattha-sangaha* (*Compendium of Philosophy*), 25; Nyanatiloka (1977 (1980), 34); AKBh ad II 46a–b (Shastri, 259; Poussin, 228).

- 15 From the root verb 'dhr' to hold, bear, carry, maintain, preserve, keep, possess, use, place, fix, etc.'. Derived meanings of *dharma* are 'that which is established or firm, steadfast, law, statute, prescribed conduct, duty, right, justice, virtue, morality, religion, etc.' (SED, 510, 519). In the Abhidharma context, it is traditionally defined as that which 'holds' (*dhāraṇa*) its own mark (AKBh ad I.2b; Shastri, 12; Poussin, 4: *svalakṣaṇād dhāraṇād dharma*).
- 16 This is arguably implicit in the perspective of dependent arising from the beginning: 'He who with right understanding sees the arising of the world as it really is, cannot attribute non-existence to the world; he who with right insight sees the passing away of the world as it really is, cannot attribute existence to the world' (S II 17).
- 17 Since *dharmas* are themselves dependently arisen events, they are expressed in terms of *patterns of relationship* (with the concomitance of X and Y, Z arises). But because the multiple conditions for the arising of a phenomenon were themselves *dharmas* (X and Y), the formula of dependent arising was fairly early on implicitly, or perhaps incipiently, a *system* wherein the sense of each item was mutually and disjunctively defined. That is, Buddhists fairly quickly came to recognize that they were working with systems of relationships rather than with terms individually defined.
- 18 Varela *et al.* make a similar point: 'The visual system is never simply presented with pregiven objects. On the contrary, the determination of what and where an object is, as well as its surface boundaries, texture, and relative orientation (and hence the overall context of color as a perceived attribute), is a complex process that the visual system must continually achieve ... In the words of P. Gouras and E. Zrenner, "It is impossible to separate the object sensed from its color because it is the color contrast itself that forms the object" ' (1991, 167; emphasis added).
- 19 As Capra (1998, 220) points out, 'as it keeps interacting with its environment, a living organism will undergo a sequence of structural changes ... an organism's structure at any point in its development is a record of its previous structural changes and ... each structural change influences the organism's future behavior'.
- 20 Reciprocal or causal causality is commonly used in investigating emergent properties, how things come to be, particularly in evolutionary biology. It is, rather, linear logic that is the problem: 'How is the world of logic, which eschews "circular argument", related to a world in which circular trains of causation are the rule rather than the exception? ... we shall see that logic is precisely unable to deal with recursive circuits without generating paradox and that quantities are precisely not the stuff of complex communicating systems. In other words, logic and quantity turn out to be inappropriate devices for describing organisms and their interactions and internal organizations' (Bateson 1979, 21).
- 21 'Evolutionary stable strategies within and between populations, whether or not they culminate in symbiogenesis, require that the "unit of selection" now ceases to be an individual genotype or even phenotype, and becomes instead a *relationship between* genotypes and/or phenotypes' (Rose 1997, 229–30; original emphasis).
- 22 'What evolves is always a unit of interactions defined by the way in which it maintains its identity. The evolution of the living systems is the evolution of the niches of the units of interactions defined by their self-referring circular organization, hence, the evolution of the cognitive domains' (Maturana and Varela 1980, 12). In Buddhist terms, we might say that is the cumulative, multidimensional, and repeated relationship between *saṃskāra* and *vijñāna* that evolves.
- 23 'Dependent on the eye-faculty and visual form, visual cognition arises; the concomitance of the three is sense-impression. Depending on sense-impression is feeling, depending on feeling is craving, depending on craving is grasping, depending on grasping is becoming, depending on becoming is birth, depending on birth old age, death, grief, lamentation, suffering, distress and despair come about. This is the arising of the world' (S II 73).
- 24 Vasubandhu describes this classic account of cyclic causality in terms of one's 'mind stream': 'the mind stream (*santāna*) increases gradually by the mental afflictions

- (*kleśā*) and by actions (*karma*), and goes again to the next world. In this way the circle of existence is without beginning (*anādi bhavacakra*)’ (AKBh III 19a–d; Poussin, 57–9; Shastri, 433–4).
- 25 ‘I shall assume that evolutionary change and somatic change (including learning and thought) are fundamentally similar’ (Bateson 1979, 164). See Waldron (2000).
 - 26 Varela *et al.* (1991, 121) interpret these two aspects of dependent arising as roughly corresponding to phylogeny and ontogeny: ‘we could say that such traces (*karma*) are one’s experiential ontogeny ... Here ontogeny is understood not as a series of transitions from one state to another but as a process of becoming that is conditioned by past structures, while maintaining structural integrity from moment to moment. On an even larger scale, *karma* also expresses phylogeny, for it conditions experience through the accumulated and collective history of our species’. One of the main differences with evolutionary theory, however, is that Indian Buddhists see the ‘evolution’ of mind in terms of the continuity of individual mind-streams from one lifetime to the next, with *karma* as the basic causal mechanism whereby changes are transmitted from one life to the next. In Darwinian thinking, this role is played by natural selection. In this sense, Buddhist ideas are akin to a form of Lamarckianism.
 - 27 See Deacon (1997, 409f) p. 151 this article.
 - 28 As Capra (1998, 220) points out, ‘as it keeps interacting with its environment, a living organism will undergo a sequence of structural changes ... an organism’s structure at any point in its development is a record of its previous structural changes and ... each structural change influences the organism’s future behavior’.
 - 29 ‘It is simply not possible’, Deacon concludes (1997, 409f), ‘to understand human anatomy, human neurobiology, or human psychology without recognizing that they have all been shaped by something that could best be described as an idea: the idea of symbolic reference’.
 - 30 ‘[S]ymbol use itself must have been the prime mover for the prefrontalization of the brain in hominid evolution’ (Deacon, 1997, 336).
 - 31 ‘As our central nervous system — and most particularly its crowning curse and glory, the neocortex — grew up in great part in interaction with culture, it is incapable of directing our behaviour or organizing our experience without the guidance provided by systems of significant symbols ... To supply the additional information necessary to be able to act, we were forced, in turn, to rely more and more heavily on cultural sources — the accumulated fund of significant symbols. Such symbols are thus not mere expressions, instrumentalities, or correlates of our biological, psychological, and social existence; they are prerequisites of it. Without men, no culture, certainly; but equally, and more significantly, without culture, no men’ (Geertz 1973, 49).
 - 32 A web, we might add, without a weaver. Anthropologist Rappaport (1999, 5): ‘It would not, indeed, be an exaggeration to claim that humanity is [its] creation’.
 - 33 Translation altered for terminological consistency.
 - 34 ‘With what manner of insight, and not grasping anything in this world, does a monk realize Nibbāna? Let him completely cut off the root of concepts tinged with the prolific tendency (*papañca*), namely, the thought “I am”.’ (SN 915–16) (Nānananda, 1971, 34f). The translation is altered slightly (*kathaṃ divā nibbāti bhikkhu anupādiyāno lokasmiṃ kiñci. Mūlaṃ papañcasankhāyāti Bhagavā mantā asmīti sabbaṃ uparundhe*). Nānananda takes ‘*mantā*’ as ‘thinker’ rather than ‘thought’.
 - 35 The Buddha describes the following, unacceptable, conception of a self: ‘That which is this self for me that speaks, that experiences and knows, that experiences, now here, now there, the fruition of deeds lovely or depraved, it is this self for me that is permanent, stable, eternal, not subject to change, that will stand firm for ever and ever’ (M I 8).
 - 36 ‘Self-representation ...’, Deacon suggests (1997, 451), ‘could not be attained without a means for symbolic representation’. ‘The label ‘I’ thus superimposed on the complex contingent process, serves as a convenient fiction of thought or a short-hand

device ... it is the outcome of *papañca* ...". Bhikkhu Ñānanda (1971, 11) concludes, 'the ego notion is an extension in thought not faithful to facts'.

- 37 The distinctions between these two forms of cognitive awareness are most succinctly stated in the *Proof Portion* of the *Yogācārabhūmi*: '1.a) The *ālaya-vijñāna* has past *samskāras* as its cause (*hetu*), while the arising forms of cognitive awareness, visual, etc., have present conditions as their cause. As it is taught in detail: "the arising of the cognitions comes about due to the sense-faculties, the sense-domains and attention" '.
- This same distinction is also articulated by Maturana and Varela's theory, as articulated by Capra (1998, 268): 'cognition involves two kinds of activities that are inextricably linked: the maintenance and continuation of autopoiesis and the bringing forth of a world'.
- 38 Tib: *sa bon thams cad pa'i sems rnam par smin cing 'jug la rgyas shing 'phel ba dang yangs par 'gyur ro*. Sanskrit reconstruction by Schmithausen (1987, 356, n. 508): **sarvabījakaṃ cittaṃ vipacyate saṃmūrchatī vṛddhiṃ virūḍhiṃ vipulatām āpadyate*. This closely parallels passages found in Pāli texts (S III 53, D III 228): *viññānaṃ ... viddhiṃ virūḍhiṃ vepullam āpajjeyya*.
- 39 Comprised of the prefix 'upa', 'towards, near, together with', plus the noun 'ādāna', 'receiving, taking to oneself' (SED), *upādāna*, like *sankhārā*, may refer to both an active process and a passive product, both a conditioning and a conditioned state. It is not only 'grasping, attachment, finding one's support by, nourished by, taking up', but also 'fuel, supply', 'the material out of which anything is made', or even 'substratum by means of which an active process is kept alive or going' (Apte, 471; PED: 149). See also Schmithausen (1987, 72).
- 40 Schmithausen reconstructs the last phrase as **nimitta-nāma-vikalpa-vyavahāra-prapañca-vāsanā-upādāna*. The import of this dauntingly long (and proliferating!) string of concepts is well summarized in Schmithausen's definition of the first item, *nimitta*, as 'in this context, objective phenomena as they are experienced or imagined, admitting of being associated with names, and being (co-) conditioned by subjective conceptual activity (*vikalpa*), which has become *habitual so that it permeates all (ordinary) perceptions and cognitions*' (1987, 357, n. 511; emphasis added).
- 41 *Ibid. Pravr̥tti-Portion* (D.3b7–4a3; H. T. 580a2–12): '“1.b)A.2. The “outward perception of the external world, whose aspects are undiscerned” (*bahirdhā-aparicchinnākāra-bhājana-vijñapti*) means the continuous, uninterrupted perception of the continuity of the world based upon that very *ālaya-vijñāna* which has inner appropriation as an object. 1.b)A.3. Thus, one should know that the way the *ālaya-vijñāna* [functions] in regard to the object of inner appropriation and the object of the external [world] is similar to a burning flame which arises inwardly while it emits light outwardly on the basis of the wick and oil, respectively”.'
- 42 *Sam̐dhanirmocana Sūtra*. Chapter V. 4. 'Viśālamati, the six groups of cognitive awareness, that is, visual cognition, aural-, olfactory-, gustatory-, tactile-, and mental cognitive awareness, arise *supported by and depending on* (*saṃnīśrītya pratiṣṭhāya*) the appropriating cognitive awareness (*ādāna-vijñāna*) [i.e. the *ālaya-vijñāna*]'.
- 43 *Pravr̥tti-Portion of Yogācārabhūmi* (D.5a3–7; H. 580b17–29): '“3.c) In this way one should understand establishing the arising [of the *ālaya-vijñāna*] is by means of the *ālaya-vijñāna* and the [supraliminal forms of] arising cognitive awareness being reciprocal conditions of each other: by means of [the *ālaya-vijñāna*] being the seed [A.1.] and creating the support [of the forms of arising cognitive awareness (*pravr̥tti-vijñāna*)] [A.2.], and by [the *pravr̥tti-vijñānas*] nurturing the seeds [B.1.], and [causing the *ālaya-vijñāna*] to grasp the seeds [of itself] [B.2.]'.
- 44 *Pravr̥tti-Portion*, 4.b)A.1.(a). (D.5a7f; P.6a5f; T.30.580b29f, 1019c6f). This unconscious self-conception accompanies all states of mind: '4.b)B.4. “The mind which was explained above always arises and functions simultaneously with the *ālaya-vijñāna*. One should know that until it is completely destroyed it is always associated with the four afflictions (*kleśa*, following Ch.) which by nature arise innately

- (*sahaja*) and simultaneously: a view of self-existence (*satkāya-dṛṣṭi*), the conceit ‘I am’ (*asmimāna*), self-love (*ātmasneha*), and ignorance (*avidyā*)”’.
- 45 ‘These abstract representations have physical efficacy. They can and do change the world. They are as real and concrete as the force of gravity or the impact of a projectile’ (Deacon 1997, 453).
- 46 Johansson (1979, 28f) has collected numerous passages that equate ‘the world’ (*loka*) with the ‘world of experience’: ‘the world has arisen through the six (senses, or sense-modalities), it gives rise to knowledge (i.e. is known) through the six; building on the six, the world is destroyed in six’ (SN 169); ‘In this very fathom-long body, with its perception and inner sense, I proclaim the world to be, likewise the origin of the world and the destruction of the world, likewise the method leading to the destruction of the world’ (A II 48); ‘These five love-objects (*kāmagunā*) are called the world in the code of the noble one. What five? Forms, cognized by the eye, longed for, alluring, pleasurable, lovely, bound up with passion and desire, sounds ... , smells ... , tastes ... , contacts’ (A IV 430); ‘The world is brought up by the mind, swept away by the mind’ (S I 39); ‘there is no release from suffering without reaching the end of the world’ (A II 49).
- 47 That the arising of consciousness and the train of responses that follow occur in discernable patterns is the gist of the series of dependent arising in general, as well as of many of the specific factors in particular.
- 48 *ad MSg* I.58. U 397a24–b4; u 266b4–267a1; Bh. 336c5f; bh. 168b7f.
- 49 It is the ‘unbounded’ nature of symbolic media, in Deacon’s (1997, 427) terms, that ‘gives us the ability to share a virtual common mind’.

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