

Buddhist Steps to an Ecology of Mind: Thinking about ‘Thoughts without a Thinker’

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For there is suffering, but none who suffers; Doing exists although there is no doer.
Extinction is but no extinguished person; Although there is a path, there is no goer.

—*Visuddhimagga*

There is no such thing as the subject that thinks or entertains ideas.

—Ludwig Wittgenstein

We are but whirlpools in a river of ever-flowing water. We are not stuff that
abides, but patterns that perpetuate themselves.

—Norbert Wiener

LUDWIG Wittgenstein has succinctly expressed what became one of the central challenges of Indian Buddhist thought:

One of the most misleading representational techniques in our language is the use of the word ‘I,’ particularly when it is used in representing immediate experience, as in ‘I can see a red patch.’ It would be instructive to replace this way of speaking by another in which immediate experience would be represented without using the personal pronoun.¹

Indian Buddhist philosophy addresses the same issue, but for the purpose of liberating sentient beings from such ‘misleading’ notions as an ‘I,’ and our

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¹ Wittgenstein 1975, p. 88.

bondage to the world of repetitive behavioral patterns—i.e., *samsara*—that such misconceptions entail. To this end, Buddhist philosophy attempts to articulate not only how we can usefully speak about immediate experience without reference to internal subjects (*ātman*), but also how we can account for the genesis of this ‘world of experience’ without recourse to supernatural agencies. These two notions, that of no-self (*anātman*) and the dependent arising of the world (*pratītya-samutpāda*) through its own interactive processes alone, are arguably the most distinctive features of the traditional Indian Buddhist world-view. Yet as any teacher of Buddhism knows, these ideas, and their subtle implications, seem extraordinarily difficult to comprehend. We are so bound by our ingrained notions of selves, substances and entities that denying them seems to defy common sense.

One of the great ironies of comparative philosophy is that most modern people already think in such terms in certain contexts: as a matter of course, most scientific accounts of causality lack anthropomorphic agents altogether. Such phenomena as gravity, chemical reactions, even most biological processes, are normally understood in terms of complex yet orderly patterns of interaction and organization which occur ‘by themselves,’ bereft of either external controlling agents or internal experiencing subjects. Analyzing human experience in such purely impersonal terms, however, seems to preclude the very dimension of immediate experience we seek to understand since it excludes from the outset notions of selfhood and subjectivity, the apparent *sine qua non* of experience itself. That is, while science is quite capable of discussing the world without a maker, it is still searching for appropriate ways of discussing thoughts without a thinker. Fortunately, Indian Buddhist analyses of mind are already expressed in a philosophical language which avoids the postulation of experiential subjects without diminishing the importance of the experiential dimension—a language which therefore provides rich opportunities for dialogue with scientific approaches to understanding mind. This is possible because 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 entities—if we think, in short, in terms of dependent arising.

This essay explores such possibilities by focusing upon two core concepts, the dependent arising of our ‘world of experience,’ and the notion of *vijñāna*, ‘discerning cognitive awareness’ or simply ‘consciousness,’ ultimately arriving at their critical confluence in the Yogācāra concept of the *ālaya-*

viññāna, a form of subliminal cognitive awareness that serves as the ‘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 notions, resulting in provocatively different, yet to our mind more evocatively contemporary, interpretations of these key Buddhist concepts. Rather than pursue a simple point-by-point comparison between these traditions, however, we seek to draw out their commonalities by engaging in an inductive, almost phenomenological inquiry into the possibilities of speaking about experience ‘without using the personal pronoun.’ This approach, perforce, focuses upon thematic, even phenomenological, coherency at the expense, we are aware, of historical particularity.

To anticipate both the argument and structure of this essay, we will focus on a number of areas where Indian Buddhist thought converges with current trends in scientific approaches to mind: (I) They both focus on patterns of dependent relationships rather than on actions of independent entities, (II) within which cognitive awareness (*viññāna*) is understood as a process which arises in dependence upon conditions, rather than a faculty which acts by cognizing objects. (III) Cognitive awareness arises, moreover, triggered by differences within a circumscribed cognitive domain, rather than as the perception of objects within a pre-existing external world. (IV) These cognitive domains have arisen through processes of circular causality (feedback systems), brought about in large part by those very discernments of differences. (V) Such differences themselves only arise within a larger classificatory context, through unconscious processes pre-formed by linguistic categories rather than through conscious processes performing rational procedures. (VI) This ‘linguistification’ of human mental processes gives rise to a symbolic self, arising out of the reflexive possibilities of language rather than reflecting the existence of substantive souls. (VII) Finally, the notion of a ‘cognitive unconscious’ epitomizes all of the above 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 mapped, classified and constructed. 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 consensus on ways to think about ‘Thoughts without a Thinker.’

I. The 'Dependent Arising of the World' as Phenomenology of Experience

The classical Indian Buddhist conception of causality² is singularly expressed in the 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)

This basic formula, 'when X is, Y arises,' states that certain conditions (X) are the generative matrix within which other conditions (Y) come to be. Whatever exists comes about dependent upon its enabling conditions and persists as long as such conditions persist. The Indian Buddhists observed that we can best understand complex causality—how things come to be—by understanding the *systemic relations* in which they are embedded and the *patterns of dependence* upon which they arise, that is, their 'dependent arising.' As we shall see, this formula subsequently became the basis for a model of circular causality in which certain specific patterns of conditions feedback upon themselves, reinforcing their own evolutionary processes. Within this deceptively simple formula, however, lies much of the distinctive Buddhist vision of the world, some of whose implications the remainder of this essay will attempt to draw out.

One of its most important implications 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 complex of conditions operates in what recurrently patterned ways in order to typically give rise to what kind of phenomena?"³ This is akin to shifting one's perspective from that of the audience enthralled with the personal drama on stage to that of the crew concerned with the supporting operations backstage. In other words, our attention on independent agents acting upon independent objects, the entrenched

² This is, unavoidably, a generalization. There were numerous schools which often differed in their interpretations of dependent arising. We seek to express here an equitable common ground.

³ 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).

grammatical syntax of conventional language,⁴ is turned toward an investigation of the complex, processual and interactive arising of things. But this focuses our attention upon *patterns of arising* rather than on actions of agents; and patterns are relational, not substantive, and arising is dynamic, not static. The Buddhist dismissal of selves, essences or unchanging entities, therefore, does not arise from logical propositions derived from first principles, such as ‘all is change,’ as much as it follows from the form of the question being raised, “how do things come to be?”⁵—a point which is all the more obvious by a similar disavowal of essences,⁶ entities or substantive selves⁷ in modern science.

This is the conceptual framework, the causal syntax if you will, within which most earlier Buddhist analyses of mind took place. It is an approach to describing and understanding experience *as it arises*. It is, in a word, a phe-

⁴ See Stern 1995, p. 79f: “In the *Philosophical Remarks*, Wittgenstein. . . maintains that the subject-predicate grammar of our everyday language has such a firm grip on us that we are usually quite unaware of its influence. Because the grammar of ordinary language has been shaped by the need to successfully manipulate our environment. . . , we usually understand experience in subject-predicate terms: we say such things as ‘I have a headache’ and take it for granted that the term ‘I’ refers to a subject, the self.”

⁵ Since, by definition, essences do not change, they can have no obvious causal effect in the world of change; an unmoving billiard ball does not 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 suggests that “a wheel that can be turned though nothing else moves with it, is not part of the mechanism” (*Philosophical Investigations*, #271).

⁶ Gombrich (1996, p. 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* . . .”

⁷ 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, pp. 120–21) 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, p. 268): “The very way that we normally conceptualize our inner

nomenology of consciousness. In order to appreciate this perspective and its larger implications for Buddhist philosophies of mind, we will examine the arising of *viññāna*, of ‘discerning cognitive awareness,’ or simply, consciousness.

II. The Dependent Arising of Cognitive Awareness

World and perceiver specify each other.

—Francisco Varela, et. al., *The Embodied Mind*

Classical Buddhist analysis of mind dissects phenomenal experience into its basic constituents, each of which, consonant with the view of dependent arising, arises in dependence upon other causes and conditions. This is well exemplified in the concept of *viññāna* (P. *viññāna*), ‘cognitive awareness’ or ‘consciousness,’ the central most concept in Buddhist understanding of mind. Although the Buddha⁸ declared in general that “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: “Visual cognitive awareness arises dependent on the eye and (visual) form” (S II 73). That is, when an object appears in a sense-field, impinging upon its respective sense organ, a moment of cognitive awareness (*viññāna*) arises.⁹ Sense-object and sense organ (or faculty) are thus correlatively defined: a visual object, by definition, is that kind of stimulus which can impinge upon an eye. The same is true for all six modes of human cognitive awareness: visual-, auditory-, olfactory-, gustatory-, tactile-, and mental-cognitive awareness. All arise depending upon the concomitance of their respective organs (or faculties), the five senses and mind,¹⁰ with their corresponding classes of stimuli.

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.”

⁸ 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 provisionally accede to their traditional attribution to the Buddha.

⁹ 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” (Ñānamoli 1995, p. 284).

¹⁰ We will return to the seemingly anomalous category of mental cognitive awareness below.

Cognitive awareness (*vijñāna*) is, moreover, a result of *discernment*. *Vijñāna* is commonly defined in Abhidharma-era texts as “the discrete discernment [of sense-objects],”¹¹ a definition emphasizing the disjunctive sense that the prefix ‘*vi-*’ (cognate with Latin ‘*dis-*’)¹² lends to the verbal root ‘*jñā*,’ ‘to know.’ We will return to this sense of discernment shortly.

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 which arises when the requisite conditions come together.¹³ 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.¹⁴

¹¹ *Abhidharma-kośa* I.16 (Poussin, tome 1, p. 30): *vijñāna prativijñapti*. *Yogacārabhūmi* (Tib. 189b 4f) has a similar definition: *rnam par shes pa ni yul so sor rnam par rig pa'i mtshan nyid gang yin pa'o*. Perhaps the most common definition is “[one] cognizes [or discerns], therefore it is called cognitive awareness” (M I 292: *vijānāti ti kho tasmā viññānan ti vuccati*). In his *Materials for a Dictionary of the Prajñāpāramitā Literature* (1967, p. 352), Conze lists the following: *vi-jānana*, being aware, *rnam par rig pa*; *vi-jānāti*, is aware, becomes aware of; *vijānīte*, discerns, become aware of; *vi-jñā*, discerning, *rig-pa*; *vijñāpti*, information; *vijñāta*, be aware of, cognized, discerned, known, *śes-pa*, *rnam par śes-pa*; *vijñāna*, *rnam par śes-pa*, consciousness; *vijñāyate*, discern, *śes*; *vijñeya*, *śes-par bya*, discernible, distinct.

¹² Thus, the standard translation of ‘*vi-*’ into Tibetan is ‘*rnam*’, ‘different, distinct, individual’ (Das, p. 757) and into Hsüan Tsang’s Chinese is ‘*fen* 分’, to divide, share, separate, distinguish’ (Mathews’ CED, p. 269, #1851).

¹³ As Rahula points out, “Consciousness does not recognize an object. It is only a sort of awareness—awareness of the presence of an object” (Rahula 1959, p. 23). *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 [56]).

¹⁴ Pruden, vol. 1, p. 118. 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.”

To ‘cling to the metaphors’ of agents and actions—as if, for example, hearing were listening and seeing were watching—obscures the radically depersonalized model of mind expressed by the notion of no-self (*anātman*). In other words, to interpret *vijñāna* as an *act* of cognition rather than an occurrence of cognitive 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.¹⁵ Cognitive awareness is not something ‘someone’ does. Like an act of nature, cognitive awareness happens.

This entails a number of important implications. Cognition, in these terms, is 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’ which 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 also correlative defined by the kinds of stimuli that may impinge upon it. In other words, the ‘subjective’ sense organs and ‘objective’ stimuli necessarily function in relation to, and are only intelligible in terms of, each other.¹⁶

On the one hand, this is just common sense, and nearly tautological: of course perception is based upon our means of cognition. We can only perceive what we can discern, and what we can discern depends upon our means of perception. On the other hand, the implications of this relational view of cognition continue unfolding as we continue asking that quintessential

¹⁵ 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, p. 84).

¹⁶ Cf. Lakoff and Johnson 1999, p. 24f: “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.”

Buddhist question: under what conditions does discerning cognitive awareness arise? For discerning cognitive awareness is not only an event that occurs temporally, but one which equally depends upon relational distinctions—and relational distinctions are hardly substances. Following the implications of such ‘insubstantial discernment,’ our epistemology based upon dependent arising begins to get slippery indeed.

III. 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.

—Gregory Bateson, *Mind and Nature*

We know we are entering a different view of the world when we read the following statement in an early Buddhist text:

The eye, arising, does not come from any place; perishing, it does not remain in any place. In this way, the eye exists after having been non-existent and, after having existed, disappears.¹⁷

Such passages call out for clarification, and not only for those unfamiliar with Buddhist thought. And yet, as we shall see, these notions follow quite logically from the basic perspective of dependent arising.

I will use the analyses of Gregory Bateson, biologist, cyberneticist, and anthropologist, to enter into the subtle implications of an epistemology based upon dependent arising—from the idea that all phenomena are necessarily in flux, to the airy notion that not only do they neither exist nor not exist but that their discernment necessarily depends upon insubstantial classificatory grids or ‘mapping.’ In his popular book, *Mind and Nature*, Bateson analyzes cognitive processes by comparing them to a simple electric switch:

[T]he 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 conduc-

¹⁷ *Paramārtha-sūnyatā-sūtra* (*Samyukta*, T 2. 92c16). As quoted in the *Abhidharmakośa*, ad AKBh V 27b (Poussin, tome 4, p. 59; Pruden, vol. 3, p. 814).

tors 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.'*

Sense organs, as we have already noted, *admit only news of difference and are indeed normally triggered only by change*, i.e., by events or by those differences in the perceived world which can be made into events by moving the sense organ. In other words, *the end organs of sense are analogous to switches*. They must be turned 'on' for a single moment by external impact. That single moment is the generating of a single impulse in the afferent nerve.¹⁸

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, i.e., by events. Bateson is not simply parroting the ancient platitude that 'everything changes.'¹⁹ Rather, he is suggesting the more fundamental notion that change is *constitutive* of perception itself. Without change, there is no perception. Hence, *to even speak of perception is necessarily to speak of events*—and this is to speak in terms of dependent arising. A cognitive event is a function of the interaction between sense organs and their correlative stimuli. Perception for Bateson, as cognitive awareness for the Buddhists, is fundamentally processual.

But it is also discriminative. Recall the definition of cognitive awareness (*vijñāna*) as "the discrete discernment [of sense-objects]." Just as the impingement of a sense organ that gives rise to a moment of cognitive

¹⁸ Bateson 1979, p. 121; emphasis added in the last three cases.

¹⁹ In his *Philosophical Remarks* (#54), Wittgenstein 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 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." (Stern 1995, p. 162). These 'solipsistic sayings,' in other words, may be constitutive conditions for what we *can* say without themselves being propositions.

awareness is a *temporally* distinct event, so too does it depend upon a *contextually* distinct difference. Bateson illustrates this as follows:

I commonly make a heavy dot with chalk on the surface of the blackboard . . . to achieve some thickness . . . If I move my finger across the spot, the difference in levels is very conspicuous . . . What happens is . . . an event, a step function, a sharp change in the state of the relationship between my fingertip and the surface of the blackboard. This example, which is typical of all sensory experience, shows how our sensory system . . . can only operate with events, which we can call *changes* . . . In the case of vision, it is true that we think we can see the unchanging . . . the truth of the matter is that . . . the eyeball has a continual tremor, called *micronystagmus*. The eyeball vibrates through a few seconds of arc and thereby causes the optical image on the retina to move relative to the rods and cones which are the sensitive end organs. The end organs are thus in continual receipt of events that correspond to *outlines* in the visible world. We *draw* distinctions; that is, we pull them out. Those distinctions that remain undrawn are *not*.²⁰

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 involve contextual differences. This is not to say that ‘differences are perceived’ (which would abandon the syntax of dependent arising), but rather that an awareness of differences is *constitutive* of perception in the same way change is. *To even speak of perception is necessarily to speak of awareness of differences.*

Awareness of differences, however, cannot arise outside of a context, since differences only occur *between* phenomena. “To produce news of difference, i.e., *information*,” Bateson observes, “there must be two entities,” since “each alone is—for the mind and perception—a non-entity, a non-being.”²¹ An absolutely isolated object would be imperceptible, like an ani-

²⁰ Bateson 1979, p. 107.

²¹ The entire passage from which these are drawn: “To produce news of difference, i.e., *information*, there must be two entities . . . There is a profound and unanswerable question about the nature of those ‘at least two’ things that between them generate the difference which becomes information by making a difference. Clearly each alone is—for the mind and perception—a non-entity, a non-being. Not different from being, and not different from non-being. An unknowable, a *Ding an sich*, a sound of one hand clapping” (Bateson 1979, p. 77).

mal which stays perfectly camouflaged as long as it does not move. That is, just as switches only arise momentarily, differences only arise contextually. Contextual differences, however, have no singular location. Bateson thus continues:

Difference, being of the nature of relationship, is not located in time or in space. We say that the white spot is ‘there,’ ‘in the middle of the blackboard,’ but the difference between the spot and the blackboard is not ‘there.’ It is not in the spot; it is not in the blackboard; it is not in the space between the board and the chalk. . . . When I wipe the blackboard, where does the difference go? . . . Difference is precisely *not* substance . . . difference . . . has no dimensions. It is *qualitative*, not *quantitative*.²²

Since awareness of differences arises contextually rather than independently, and is episodic rather than enduring, it has no substantive existence. Not being a substance, it neither comes nor goes anywhere. The scriptural passage cited earlier in this section thus answers Bateson’s query, “where does the difference go?”: as an object of awareness, “the eye, arising, does not come from any place; perishing, it does not remain in any place.” The arising of cognitive awareness, which arises in the interface between the sense-fields and sense-faculties, is *axiomatically* both momentary and discerning. All phenomena, the Buddhist sutras state, are evanescent like “a dew drop, a bubble, a dream, a lightning flash or a cloud.”

Bateson’s ideas also suggest an interesting approach to the elusive notion of *dharma* found in the Abhidharma traditions (roughly 200B.C.E.-600C.E.). Although Abhidharma has many dimensions, we shall consider it here only insofar as it is a “phenomenological psychology” whose “primary concern . . . is to understand the nature of experience, and thus the reality on which it focuses is conscious reality, the world as given in experience.”²³ Abhidharma, in this respect, represents an attempt to systematically analyze mental processes in terms of experiential events—and it is these momentary²⁴ and

²² *Ibid.*, p. 109f.

²³ Bodhi 1993, p. 4.

²⁴ The *Abhidharma-kośa* defines as momentary that which perishes immediately after coming into being. (AKBh IV *ad* 2b–3b; Shastri, p. 568; Poussin, tome 3, p. 4). There was of course considerable disagreement as to what exactly constitutes a moment, whether it is divisible and so on. See, for example, *Kathāvatthu* XXII.8, the *Abhidhammattha-sangaha*, (*Compendium*, p. 25; Nyanatiloka 1980, p. 34); AKBh *ad* II 46a–b (Shastri, p. 259; Poussin, tome 1, p. 228).

distinctive events that are called *dharmas*.²⁵ While dharmas have often been interpreted as elements of existence, as if they referred to substantive constituents of an objective world, we suggest an interpretation in the terms of dependent arising of cognitive awareness described above. A dharma refers, that is, like the sensation of the spot on the chalkboard, to each momentary and distinct aspect of experience insofar as it is perceptively involved in the arising of cognitive awareness. Thus it *logically follows* from our mode of analysis that dharmas arise from nowhere and go nowhere. That is, like the distinctions triggered by Bateson's finger on the chalk spot, dharmas have no actual substance nor any singular location; they are neither a 'something' nor a 'nothing,' ontologically speaking.²⁶ Consistent with our previous analysis: without change or distinctions, there are no dharmas.

It is this notion of dharmas—as distinct phenomena which lack location and substantive existence, that evanescently arise from nowhere and go nowhere—that became the basic unit with which Abhidharma analyzes and describes the arising of cognitive awareness and other processes of mind. That is to say, that insofar as every one of the conditioning factors that instigate a moment of cognitive awareness *themselves become events* that give rise to conscious awareness, they become dharmas. No dharma can therefore be distinguished by itself; “there must be two entities,” as Bateson says. Otherwise, each dharma would itself be indiscernible. *To even speak of dharmas then is necessarily to speak of a context of distinctions.* These are, of course, the same conclusions we drew above with our analysis of perception, except that they may now also be reflexively applied to the systemic differentiation 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.”²⁷

²⁵ From the root verb ‘*dhr*,’ “to hold, bear, carry, maintain, preserve, keep, possess, use, place, fix, etc.” (SED, p. 519). Derived meanings of *dharma* are “that which is established or firm, steadfast, law, statute, prescribed conduct, duty, right, justice, virtue, morality, religion, etc.” (SED, p. 510). In the Abhidharma context it is traditionally defined as that which ‘holds’ (*dhāraṇa*) its own mark (AKBh *ad* I.2b; Shastri, p. 12; Poussin, tome 1, p. 4: *svalakṣaṇā-dhāraṇād dharma*).

²⁶ 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).

²⁷ Piatigorsky 1984, p. 8.

Although we will return to this notion of reflexivity below, we must point out here one further implication of the logic, the causal syntax, of dependent arising. 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.²⁸ This relativizes the notion that dharmas have any truly independent ‘distinguishing characteristic’ (AKBh *ad* I.2b; *svalakṣaṇa*),²⁹ and marks our departure from most orthodox Abhidharma systems.

We thus come to the surprising conclusion that while these distinctions do not refer to substances or entities, either ontologically *or* epistemologically, they are nevertheless constitutive of both perception and the entire system of knowledge based upon dharmas. Without such distinctions, there can be no such knowledge. Knowledge thus depends not just upon the arising of an awareness of difference triggered by an impingement of a sense organ, but even more fundamentally upon the *classifications implicit in any such distinction*. The arising of cognitive awareness is therefore not just correlative to our sense organs or faculties, but also to the very possibilities for such distinctions that are enstructured in those organs and faculties in the first place. We cannot help seeing something as red rather than blue, hearing pitches as high or low, feeling distinct textures or disparate temperatures, or smelling odors enticing or odious. Since such distinctions are *constitutive* of cognitive awareness, the classifications they depend upon are also indispensable for any arising of discerning cognitive awareness (*vijñāna*). As cognitive scientists Lakoff and Johnson point out:

²⁸ Since dharmas are themselves dependently arisen events, they are typically expressed in terms of *patterns of relationships* (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 individual terms alone.

²⁹ Harland makes a similar point, citing, then commenting on Saussure’s ‘principle of differentiation’ (Saussure 1959, p. 117): “The concepts are purely differential and defined not by their positive content but negatively by their relations with the other terms of the system. Their most precise characteristic is in being what the others are not.’ Such concepts are like holes in a net: specified by their boundaries but empty in themselves” (Harland 1987, p. 15).

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*. They are the structures that differentiate aspects of our experience into discernible kinds. Categorization is thus not a purely intellectual matter, occurring after the fact of experience. Rather, the formation and use of categories is the stuff of experience.³⁰

Our cognitions and distinctions, and the implicit schemas that inform them, thus constitute our experienced ‘world.’ While the map may not be the territory, *our world* is unavoidably a mapped world.³¹

Thus far, we have analyzed the arising of discerning cognitive awareness, of experience without a subject, as a discrete event, first temporally, as a process which occurs when some stimulus impinges upon its correlative sense organ or faculty, and then epistemologically, insofar as those stimuli are contextually distinguished in dependence upon some embedded and implicit system of distinctions. Our further inquiry into the conditions for the arising of this world of experience will proceed from this, leading into two initially diverging, but ultimately converging, directions: first, we will exam-

³⁰ Lakoff and Johnson 1999, p. 18f; emphasis in original. 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*’” (Varela, et. al. 1991, p. 167; emphasis added).

³¹ This is neither a variety of solipsism nor of idealism, since discerning cognitive awareness is an emergent process that arises conditioned by *both* sense organs and sense-objects. Johansson (1979, 28f) similarly concludes that in early Buddhism “there is no independently existing world. The world is a dynamic process, constantly being produced and deliberately constructed by our senses, our thoughts, and our desires . . . This does not mean that we and the world are unreal or a mere illusion. The objects are there but our perceptions of them are constituent and essential parts of them . . . the cleavage into ‘objective’ and ‘subjective’ was never made; the subjective process of image-formation was thought to be part of the object itself.”

Similarly, the Chilean biologists Varela and Maturana “do not assert that ‘nothing exists;’ they assert that ‘no things exist’ independent of the process of cognition. There are no objectively existing structures; there is no pregiven territory of which we can make a map—the *map making itself brings forth the features of the territory*” (Capra 1997, p. 271; emphasis added).

ine the co-evolutionary processes whereby sense organs and faculties come to be correlative with the stimuli they are receptive to, the so-called ‘structural coupling with the world;’ and, dependent upon that, how the classificatory schemas embedded in these faculties become inseparable from language use, which is itself inescapably intersubjective. These two directions will be reunited in the notion of the ‘cognitive unconscious,’ a dimension of mind resulting from the intertwined co-evolutionary processes of our neurological, linguistic and social lives. This development implies that transient and insubstantial events, such as the discrete awareness of differences “not located in space and time,” can, over time, give rise to the phenomenal world we collectively inhabit—bodies and all. These processes involve, however, a series of vicious circles—in which thoughts without a thinker lead to acts without an actor, and a world without a maker, which leads on to further thoughts, etc.—from which we can hardly find respite.

IV. Circular Causality Brings Forth a World: *Biology*

In mental process, the effects of differences are to be regarded as transforms of the difference which preceded them . . . [D]ifferences . . . and their trains of effects in promoting other differences become material of information, redundancy, pattern, and so on.

—Bateson, *Mind and Nature*

How then can there be causality without agents? And, more specifically, how is it that our sense-faculties come to be receptive to the particular types of stimuli that impinge upon them, which together give rise to our world of experience? 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 the discernment of differences is thus part of a larger feedback cycle in which “the effects of differences are to be regarded as transforms of the differences which preceded them.” These two notions—*circular causality*, in the form of recursive feedback processes, and *epigenesis*, wherein the results of previous events serve as the basis for succeeding ones—comprise another area where Buddhist philosophy has much in common with scientific models of causality, particularly those of cognitive science and evolutionary biology. In both perspectives, these models turn our attention away from independent acts of isolated entities and toward

particular patterns of interaction that give rise both to immediate forms of cognitive awareness and, in the long run, to the living forms we all embody. That is, circular causality operates at both micro and macro levels.

At the micro level, as we have seen, discerning cognitive awareness arises whenever our sensory organs are impinged upon, as, for example, through the incessant tremor of the eyes which continuously gives rise to visual cognitive awareness. The very processes of living ensure that there is virtually no time, even during sleep, when our sense organs are not being impinged upon in some fashion. Our pulmonary and respiratory systems alone prevent that. To speak of living therefore is necessarily to speak of the continuous changes in our skin cells, blood vessels, neurons, etc., which continuously impinge upon our senses and hence continuously give rise to moments, however faint, of cognitive awareness. This inseparability between cognitive processes and the processes of living led biological philosophers Maturana and Varela to effectively equate the two: “*living systems are cognitive systems and living as a process is a process of cognition.*”³² In other words, the processes of change are equally constitutive of life and of the arising of cognitive awareness.

The reverse, of course, is also true. The cognitive processes inseparable from living continuously bring about changes in the organism. All cognitive processes, by definition, involve some neural response, some organismic activity. As Capra puts it in his *Web of Life*, “the human nervous system . . . interacts with the environment by *continually modulating its structure.*”³³ That is, there is no cognition without a simultaneous change in the structure of an organism, in its cells, neurons, etc. Hence, Capra reverses the equation of cognition with life to say that “the structural changes in the system constitute acts of cognition.”³⁴

These two notions—that living entails continuous cognition and cognition entails continuous modification of living structure—introduce an important causal reciprocity between the structure of sense organs and the arising of cognitive awareness. That is, stimuli are always impinging upon the sense

³² Maturana and Varela 1980, p. 13.

³³ Capra 1997, p. 68; emphasis added. See also Marvin Minsky, *Society of Mind* (1986): Brains “use processes that change themselves—and this means we cannot separate such processes from the products they produce. . . . *The principal activities of brains are making changes in themselves,*” as cited in Varela, et. al. 1991, p. 139.

³⁴ Capra 1997, p. 267. Apropos our earlier analysis, we would use the passive voice here.

organs, giving rise to forms of cognitive awareness; and these processes continuously but subtly modulate the structures of these organs, which in turn influence their receptivity to subsequent stimuli. As we know from Hebb's rule in neural pathways, the occurrence of cognitive processes reinforces their underlying neural structures, increasing the likelihood of them reoccurring in conjunction with similar processes. This causal reciprocity between cognition and structure provides, then, a working definition of a living system: *An organism is something that maintains its organization by continuously reinforcing its own structures through its cognitive, that is, living, processes.*³⁵ Maturana and Varela have thus coined the term 'autopoiesis,'³⁶ roughly 'self-making,'³⁷ to express how organisms "transform matter into themselves in a manner such that the product of their operation is their own organization."³⁸ Cognitive systems, living systems, and autopoietic systems are here virtually synonymous.

These reciprocal or autopoietic processes take place not only at the micro level of cognition, but also at the macro level of evolution. Both evolutionary biology and the view of dependent arising articulate models of circular causality to describe how things come into being over the long term through recursive feedback processes.³⁹ Briefly,⁴⁰ evolution occurs through differen-

³⁵ See Capra 1997, p. 218: "One type of structural changes are changes of self-renewal. Every living organism continually renews itself, cells breaking down and building up structures, tissues and organs replacing their cells in continual cycles."

³⁶ Maturana and Varela 1980, p. 79f. In the words of Capra: "Autopoiesis, or 'self-making' is a network pattern in which the function of each component is to participate in the production or transformation of other components in the network. In this way the network continually makes itself. It is produced by its components and in turn produces those components" (Capra 1998, p. 162).

³⁷ Buddhists of course would be cautious in using the term 'self,' which in Indian philosophical contexts implies an unchanging essence that can cause itself. This is clearly not what 'self' means in this context. 'Auto' or 'self' has much the same non-metaphysical sense as it does in 'autopilot,' here suggesting how these phenomena renew themselves through feedback processes comprised of their own structured activities.

³⁸ Maturana and Varela 1980, p. 82.

³⁹ Theories of reciprocal or circular causality are commonly used in investigating emergent properties, how things come to be, particularly in evolutionary biology. It is, instead, 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

tial reproductive success, a process whereby creatures who reproduce more prolifically pass on more of their heritable characteristics. This depicts “a circle of positive feedback” in which whatever differences lead to greater reproductive success are steadily reinforced over time. Complex structures are gradually built up by the successful changes or modifications of each generation, both by their proliferation through greater reproduction, as well as by becoming the basis for each succeeding generation. As an *epigenetic*⁴¹ process, therefore, “every evolutionary step is an addition of information to an already existing system.”⁴² In this fashion, the structures of all life, including human life, have come into being conditioned by an immensely long, complex and unending series of transformations over countless generations. As biological creatures, this means 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.⁴³

This focus upon interactive relationships, however, radically alters our ideas of what exactly ‘evolves’ in much the same way that our analysis of the dependent arising of cognitive awareness alters our ideas of who exactly cognizes.

As we have seen, cognitive awareness arises with the concomitance of an appropriate stimulus, an ‘object,’ and its respective sense organ or faculty. Cognitive awareness is a function of all of these together, neither of them separately. They are also correlative: the kind of stimulus that may impinge upon a sense organ depends upon the structure of that organ. Humans, for

systems. In other words, logic and quantity turn out to be inappropriate devices for describing organisms and their interactions and internal organizations” (Bateson 1979, p. 21).

⁴⁰ We cannot do justice to the rich and complex thinking on causality in evolutionary theory. Nor is there sufficient space to explore its possible parallels with Buddhist ideas of dependent arising. We have touched upon these elsewhere (Waldron 2000).

⁴¹ We are adapting this term from embryology and extrapolating it to developmental processes in general. Epigenesis generally “stresses the fact that every embryological step is an act of *becoming* (Greek *genesis*) which must be built *upon* (Greek *epi*) the immediate status quo ante” (Bateson 1979, p. 52). Epigenesis is an important yet usually implicit correlate of circular causality. The best biological example (outside of embryology) is the formation of habits, whose underlying neurological networks are gradually built up through repetition.

⁴² Bateson 1979, p. 22.

⁴³ Carrithers 1992, p. 48f: “The notion of an evolutionary ratchet is consonant with the idea of co-evolution, which suggests that organisms may produce changes in the environment, changes which redound on themselves, creating a circle of positive feedback.”

example, cannot see ultraviolet light or hear ultrasonic sounds; bees and bats can. Taking an organism's eye-view, Maturana and Varela therefore argue that "perception should not be viewed as a grasping of an external reality, but rather as the specification of one."⁴⁴ That is, what *constitutes* the 'world' or 'environment' for any given organism depends upon its specific cognitive structures, since it is these that specify its 'cognitive domain.'⁴⁵ Biologically speaking, then, 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*."⁴⁶ To even speak of a 'world' therefore is necessarily to speak of a cognizing, that is, an interacting organism. Without an organism, there is no 'environment,' without cognitive interaction, no 'world.'⁴⁷ In this sense, and consonant with the view of dependent arising, "world and perceiver specify each other."⁴⁸ As Capra notes, "cognition, then, is not a representation of an independently existing world, but rather a continual *bringing forth of a world* through the process of living."⁴⁹

Defining the 'world' or 'environment' in this way—as that which comes into being for any given organism through the arising of its cognitive domain—is also used to describe the processes through which beings or species evolve or come into being over time. What *constitutes* an 'environment' for any organism, Tooby and Cosmides argue, are only "those particular aspects of the world that are rendered developmentally relevant by the evolved design of an organism's developmental adaptations."⁵⁰ And it is

⁴⁴ Maturana and Varela 1980, p. xv.

⁴⁵ See Capra 1997, p. 269f: "Living organisms respond to only a small fraction of the stimuli impinging on them . . . In this way each living system builds up its own distinctive world according to its own distinctive structure . . . The range of interactions a living system can have with its environment defines its 'cognitive domain' . . . one that is always dependent upon the organism's structure."

⁴⁶ Maturana and Varela 1980, p.10f; emphasis added.

⁴⁷ As geneticist Richard Lewontin points out, "An environment is something that surrounds or encircles, but for there to be a surrounding there must be something at the center to be surrounded. The environment of an organism is the penumbra of external conditions that are relevant to it because it has effective interactions with those aspects of the outer world" (Lewontin 2000, p. 48). That is, "Just as there can be no organism without an environment, so there can be no environment without an organism" (Lewontin 1983, as cited in Varela, et. al. 1991, p. 198).

⁴⁸ Varela, et. al. 1991, p. 172.

⁴⁹ Capra 1997, p. 267.

⁵⁰ Tooby and Cosmides 1992, p. 84f.

“this *developmentally relevant environment*,” they continue, “the environment as interacted with by the organism—that, in a meaningful sense, can be said to be the product of evolution.”⁵¹ Thus, as with our analysis of cognitive awareness, evolutionary theory also shifts attention from the arising of entities to patterns of interaction. “What evolves,” Maturana and Varela observe “is always a unit of interactions,”⁵² neither the organism by itself, and certainly not the environment alone, but the organism-in-environment. In other words, it is *patterns of interaction that evolve*,⁵³ representing “the evolution of the cognitive domains.”⁵⁴ And, similarly, the evolution of its cognitive domain is the evolution of the ‘world’—*for that specific kind of organism*. In this way, a distinctive world is gradually built up in accordance with the distinctive structures of each living system through its entire history of organism-environment interactions, a process Maturana and Varela call a ‘structural coupling with the world.’ Just as with the arising of cognitive awareness and the functioning of living systems, the evolution of species is seen as the coming into being of specific patterns of interaction rather than the arising of independent entities. As physicist Norbert Wiener notes, “We are not stuff that abides, but patterns that perpetuate themselves.”⁵⁵

V. Circular Causality Brings Forth a World: *Buddhism*

The Elder traced a circle (*cakka*) on the ground and spoke thus to King Milinda: “Is there an end to this circle, sire?”

“There is not, revered sir.”

“Even so, sire, are those cycles (*cakka*) that are spoken of by the Lord: ‘Visual consciousness arises because of eye and material shapes, the meeting of the three is sen-

⁵¹ “Evolution shapes the relationship between the genes and the environment such that they both participate in a coordinated way in the construction and calibration of adaptations. Thus, evolutionarily patterned structure is coming in from the environment, just as much as it is coming out from the genes.” (Tooby and Cosmides 1992, p. 86).

⁵² Maturana and Varela 1980, p.12.

⁵³ Rose 1997, p. 229f: “Evolutionary stable strategies within and between populations, whether or not they culminate in symbiogenesis, require that the ‘unit of selection’ now cease to be an individual genotype or even phenotype, and becomes instead a *relationship between* genotypes and/or phenotypes.”

⁵⁴ Maturana and Varela 1980, p.12: “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.”

⁵⁵ Wiener 1950, p. 96.

sory impingement; conditioned by sensory impingement is feeling; conditioned by feeling is craving; conditioned by craving is kamma [*karma*]; vision [*chakkhu*, lit.: eye] is born again from kamma' — is there thus an end of this series?"

"There is not, revered sir." . . .

"Even so, the earliest point of [samsaric] time cannot be shown either."

—*Milinda's Questions.*

We may now better appreciate some of the implications of the formula of dependent arising, whose cyclic nature warranted the appellation '*samsāra*,' literally 'the going around.' This latter is traditionally taken as the course of an individual's nearly infinite series of lifetimes; in modern Buddhist vernaculars it simply refers to this life. As with evolutionary theory, this theory of circular causality applies equally well to both temporal dimensions,⁵⁶ and the twelve factors⁵⁷ of the series of dependent arising—often depicted in the famed Wheel of Life (*bhava-cakra*) on walls of Buddhist temples throughout Asia—are typically so explained. The cyclic and epigenetic nature of this causal model is epitomized in the reciprocal relationships between cognition and structure, that is, between cognitive awareness (*viññāna*) (and its closely associated activities⁵⁸) and the multiple senses of *samskāra* (Pāli *sankhāra*), the various structures and activities comprising human embodiment which also serve as the basis for cognitive awareness. These two concepts, with the crucial addition of the cognitive and emotional afflictions (*kleśa*), constitute the dynamic core of our conditioned, cyclic existence—of *samsara*.

There is no adequate translation for the term *samskāra*. It has both an active and a nominal sense, 'the act of forming' as well as 'that which is formed.' In its broadest sense, most phenomena in the world are considered

⁵⁶ This overlapping of causal domains is widely found in scientific theories of causation, particularly with circular causality, and complexity and self-organization theory. Bateson 1979, p. 164: "I shall assume that evolutionary change and somatic change (including learning and thought) are fundamentally similar."

⁵⁷ It should be pointed out that there are so many variations of this formula in the early texts that it is not at all obvious what the original formula may have been, if indeed there was just a single one, or what exact form it may have taken. There are variations in which certain terms are missing and others are added, or in which the chain begins or ends with different factors. We may thus consider these formulations less as exclusively defined cause and effect relationships than as varied expressions of the basic theme of dependent arising, i.e., certain conditions arise in dependence on appropriate combinations of other causes and conditions.

⁵⁸ *Viññāna* is one of a set of processes which arise together in response to similar stimuli. Feeling and apperception, for example, themselves considered karmic complexes of mind (*citta*) (M I 301: *saññā ca vedanā cittasankhāro*), are so associated with *viññāna* as to be vir-

saṃskārās insofar as they are compounded or put together.⁵⁹ Thus, *saṃskārā* also comprises the various structures supporting living processes insofar as these are *constructed* from past actions. In other contexts, the term refers to the *constructive* activities in the present, being virtually synonymous with intention (*cetanā*), the defining characteristic of karma, actions that accrue consequences.⁶⁰ *Saṃskārās* are, like organisms which continually modulate their own structures, both continuously and simultaneously *conditioning* and being *conditioned* by ongoing experience. This is crucial for understanding the dynamics of cyclic causality depicted in the series of dependent arising.

Near the beginning of the formula (2) *saṃskārā* refers to the various physical, mental and emotional structures or complexes continuing from past lives, which condition the arising of cognitive awareness at the time of rebirth. In a sense that virtually equates them, Buddhists considered (3) *viññāna* a *sine qua non* of life, whose advent and departure mark the beginning and end of a particular lifetime.⁶¹ Thus the next step in the series, the

tually inseparable: “Feeling, apperception, and cognitive awareness, these factors are conjoined, not disjoined, and it is impossible to separate each of these states from the others in order to describe the difference between them. For what one feels, that one apperceives; and what one apperceives, that one cognizes” (M I 295; Nānamoli 1995, p. 389); terminology altered for consistency.

⁵⁹ Compounded of the prefix ‘*saṃ*,’ ‘with’ or ‘together with,’ and a form of the verbal root ‘*kr*,’ ‘to do or make,’ *saṃskārā* literally means ‘put or made together’ or simply ‘formation.’ In its widest sense, *saṃskārā* refers to the entire phenomenal world, inasmuch as everything has been formed from various causes and conditions. In the psychological sense, *saṃskārā* refers to the volitions, dispositions and actions that constitute human life, both insofar as these are *constructed* complexes formed from past actions and *constructive* activities formative of present and future experience. Edgerton (BHSD, 542) describes *saṃskārā* as “predispositions, the effect of past deeds and experience as conditioning a new state,” and thus as “conditionings, conditioned states.” Collins also stresses this dual sense: “Both the activity which constructs temporal reality, and the temporal reality thus constructed, are *saṃskārā*” (Collins 1982, p. 202).

⁶⁰ S III 60 defines *sankhārā* (the Pāli equivalent of *saṃskārā*) simply as a “group of intentions,” (*cetanākāya*), i.e., intentions in regard to form, sounds, etc., the five objects of the senses and mind, as does A III 60: “And what, O monks, are *sankhārā*? O monks, the *sankhārā* are the sixfold group of the intentions (*sañcetanā*) in regard to material form (etc.)” When *saṃskārā* refers to intentional actions, these are actions that lead to karmic results: “Monks, I say *kamma* is *intention*; having intended, one does *kamma* (action) through body, speech, and mind” (A III 415).

⁶¹ As a factor of samsaric continuity, it is the ‘stationing’ or ‘persistence’ (*paṭiṭṭhite*) of *viññāna* in this world that constitutes the endless wheel of life and death: “Consciousness (*viññāna*) being established and growing, there comes to be renewed existence in the future”

arising of (4) the psycho-physical organism (name-and-form, *nāma-rūpa*), depends upon these cognitive processes in order to develop. On the other hand, cognitive awareness also depends upon some kind of psycho-physical basis (in this world⁶²), so there is an explicitly reciprocal relationship between the arising of cognitive awareness and its psycho-physical basis.⁶³ With the gradual growth of the organism, the conditions for complex cognitive processes develop, epitomized in the next set of factors—(5) the six sense-spheres, (6) contact (or sensation), and (7) feeling—which are themselves instigated by, or even effectively equated with, the cognitive processes as a whole.⁶⁴ The series has thus far depicted how the various cognitive structures—the sense organs and their specific sense-faculties—enable and condition the arising of cognitive awareness and has indicated the first, affective responses to it.

But to be circular, cognitive awareness must also give rise to new actions which reinforce these structures. The sensations and feelings elicited by cognitive awareness thus give rise to the next chain of processes—(8) craving,

(S III 143). “I have said that consciousness conditions name-and-form . . . Were, Ānanda, consciousness not to descend into the mother’s womb, would name-and-form coagulate there?” ‘No, Lord.’ ‘Were consciousness, having descended into the mother’s womb, to depart, would name-and-form come to birth in this life?’ ‘No, Lord.’” (D II 62; PTS). “When, then, the three factors of life, heat, and consciousness abandon this body, it lies cast away and forsaken like an inanimate stick of wood” (S III 143; PTS).

⁶² Indian Buddhist cosmology includes non-corporal realms of existence where cognitive awareness has non-corporal bases for its arising.

⁶³ S II 114: “Just as two sheaves of reeds might stand leaning one against the other, so too, with name-and-form as condition, consciousness [comes to be]; with consciousness as condition, name-and-form [comes to be]. With name-and-form as condition, the six-sense-bases [come to be]; with the six-sense-bases as condition, contact . . . Such is the origin of this whole mass of suffering.”

⁶⁴ “Dependent on the eye and forms, eye-consciousness arises; the meeting of the three is contact; with contact as condition there is feeling; with feeling as condition there is craving” (M III 282; Nāṇamoli 1995, p. 1131; also M I 111). Nor, in fact, is this relationship always expressed in this sequence: “Consciousness is dependent upon feeling born of visual contact” (M III 260; Johansson 1979, p. 92). The *Abhidharma-kośa* also mentions cognitive awareness (*viññāna*) in connection with these factors in the series. Based upon a previous moment of *viññāna*, *nāma-rūpa* develops with its six organs and the six sense-spheres (*āyatana*). Being impinged by an object (*viśaya*), another moment of cognitive awareness arises, and, through the coming together of the three—cognitive awareness, the six sense-spheres (*āyatana*) and a sense-object (*viśaya*)—there is contact, which conduces toward a pleasant feeling, and so on (AKBh III 28a-b; Shastri, p. 461).

(9) grasping and (10) becoming—which eventually reinforce their own enabling structures. That is, it is the karmic actions (here ‘becoming’) instigated by the afflictive (*kleśa*) attitudes of craving (*tanhā*) and grasping that perpetuate and reinforce the very structures⁶⁵ that bring about ‘the arising of the world’ (S II 73).⁶⁶ S II 101 similarly states that when there is pleasure in, or passion or craving (*tanhā*) for the sustenances (*āhāra*) of sentient beings who are already born or who desire to come to be (*sambhavesina*), then,

consciousness becomes established and comes to growth. Wherever consciousness becomes established and comes to growth, there is a descent of name-and-form. Where there is a descent of name-and-form, there is growth in the karmic formations (*saṅkhārā*).⁶⁷ Where there is growth in the karmic formations, there is the production of future renewed existence.

In short, the series of dependent arising depicts a recursively cyclic process between the constructed complexes (*saṃskārā*), cognitive awareness (*viññāna*), and the constructing afflicted actions these both enable and elicit: for *as long as* the cognitive processes give rise to sensation and feeling, then craving and grasping will tend to arise, which in turn tend to elicit the intentional afflicted activities, the karmic actions, that ultimately create and sustain the structures (*saṃskārā*) that constitute further existence and the ‘arising of the world.’ 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, etc.—is, I submit, the core of the pre-Mahāyāna Buddhist world-view.⁶⁸

⁶⁵ “Karma, craving and ignorance are the cause of *saṃskārās* in the future” (AKBh ad VI 3; Shastri, p.887; Poussin, tome 4, p.137). Pruden identifies this passage as *Samyukta*, T 2.88b9.

⁶⁶ “Dependent on the eye-faculty and visual form, visual cognitive awareness 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).

⁶⁷ We should point out that most of the remaining factors of the twelve-member series are simply replaced here by *saṅkhārā*. We are indebted to Aramaki (1985, p. 94) for pointing out the significance of this passage.

⁶⁸ 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 (*kleśa*) and by actions

These processes are not merely cyclic, of course. They are also ‘epigenetic’ in that specific bodily structures and dispositions have been continuously ‘built up’⁶⁹ from past experiences and activities, ‘countless lifetimes’ as the Buddhists put it. These epigenetic processes, propelled by the feedback loops of circular causality, do not concern the evolution of independent entities considered separately from some external world, but rather reflect the continued replication of *patterns of interaction*, such as expressed in the various formulations of dependent arising. It is these *patterns* whereby cognitive or living systems come into being, their patterns of dependent arising, that constitute the ‘product’ of evolution. In this sense, both evolutionary biology and Buddhist thought analyze the causal relations underlying momentary cognitive processes and long-term evolutionary processes in similar ways: the ‘arising of the world’ for an individual, its ontogeny, as well as for a species, its phylogeny,⁷⁰ can be equally well understood as the ‘arising of the world, the ‘bringing forth’ of specific cognitive domains, out of the dynamic vortex of cyclic causality.

This reciprocal causality between our cognitive activities (*viññāna*) and the structures of our bodies and minds (*samskāra*) radically revises our understanding of the role mental processes play in evolution, the second trajectory of our discussion indicated above. We have just suggested that the interaction between cognitive awareness and its supporting structures, which entails continuous modification of these structures, is also causally effective at a developmental or evolutionary scale. That is, our evolved structures

(*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, tome 2, pp. 57–59; Shastri, pp. 433–34).

⁶⁹ “This body does not belong to you, nor to anyone else. It should be regarded as [the results of] former action that has been constructed and intended and now to be experienced” (S II 64). Most of the important processes within the series of dependent arising, such as *viññāna* and *samskāra*, are often said to ‘grow and increase.’ See S II 65, and S II 101 above.

⁷⁰ Varela, et. al. (1991, p. 121) interpret these two dimensions 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 transformations are transmitted from one life to the next. In Darwinian thinking, this function is played by the interaction between genes, the environment and natural selection. In this sense, Buddhist ideas are more akin to a form of Lamarckianism.

reflect the accumulative history of our varied forms of cognitive activity as much as vice versa (i.e., not only do *samskāras* condition *viññāna*, but *viññāna* conditions *samskāras*.) We might dwell on this a moment.

As we recall, each form of cognitive awareness arises conditioned by sensory (or mental) stimuli within its cognitive domain, as well as by the psycho-physiological structures (*samskāra*), the sense organs or faculties, which have been built up by previous karmic activities. These faculties are themselves only receptive to particular kinds of stimuli, whose categorical distinctions are constitutive of that form of cognitive awareness in the first place. As Lakoff and Johnson note, “The categories we form are *part of our experience*,”⁷¹ not something added on. And since, in the epigenetic causal processes outlined above, the activities following the arising of cognitive awareness reinforce the very structures (*samskāra*) that support them, this means that the particular implicit and often innate classificatory systems that condition cognitive awareness *themselves* become important factors in the further development of living structures (*samskāra*). 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 level of the species, as in evolutionary development. As anthropologist, Barash observes,

If evolution by natural selection is the source of our mind’s *a priori* structures, then in a sense these structures also derive from experience—not the immediate, short-term experience of any single developing organism, but rather the long-term experience of an evolving population. . . . Evolution, then, is the result of innumerable experiences, accumulated through an almost unimaginable length of time. The *a priori* human mind, seemingly preprogrammed and at least somewhat independent of personal experience, is actually nothing more than the embodiment of experience itself.⁷²

To the extent that this is so (and evolutionary processes are most commonly seen in just these terms⁷³), this means that the systemic categorizations and

⁷¹ Lakoff and Johnson 1999, p. 18.

⁷² Barash 1979, p. 203; emphasis in original.

⁷³ See Deacon 1997, p. 352: “Some sort of positive feedback process like this has been invoked by most theories of human cognitive evolution.”

classifications underlying our cognitive systems have had important causal influences on human evolution in their own right. 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 processes—which have no spatial location and come from nowhere and go nowhere—were indispensable conditions for the long-term dependent arising of our minds and bodies. In Buddhist terms, the dharmas that are discerned are constitutive conditions for ‘the arising of the world,’ not just epistemologically, which is obvious, but ontologically as well. Without discernment, there is no cognitive awareness (*viññāna*); without cognitive awareness, and its associated activities, no conditioned structures (*saṃskārā*); and without conditioned structures, no bodies and minds. In short, *there would be no distinctively human embodiment without the classifications and categorizations constitutive of the arising of distinctively human forms of cognitive awareness itself.*

And what is the most influential source of human categorization and classification, whose distinctions have no spatial location either inside or outside of our brains,⁷⁴ which represents patterns of intersubjective interaction that have “evolved spontaneously,”⁷⁵ and is, furthermore, one of the most salient features of the physical and mental structures of human life? Language. “The major structural and functional innovations that make human brains capable of unprecedented mental feats evolved in response to the use of something as abstract and virtual as the power of words . . . ,” biological anthropologist Deacon intones.⁷⁶ “The physical changes that make us human are the incarnations, so to speak, of the process of using words.” We are not only the results of what we have thought, felt and done, but, above all, of what we have heard and said. We are, in short, the word become flesh.

VI. Cognitive Awareness Arising from Consensual Communication

The manner and sensory means by which living things construe their environment will be the same media through which the environment— ‘the world’—gives itself back to them . . . Language is a primary medium through which humans inhabit their world. Language names what the world is, and the world complies, delivering itself back to us through our own namings. Languages are indeed like habitats.

—William Paden, *Interpreting the Sacred*

⁷⁴ Deacon 1997, p. 409f. (quoted in note 84 below).

⁷⁵ *Ibid.*, p. 110.

⁷⁶ *Ibid.*, p. 322.

We may now more directly approach the quandaries raised at the outset of this essay: how, absent any external agent or internal experiencer, could our cognitive structures, built up through multi-generational, evolutionary streams of organism-environment interaction, ever give rise to the phenomenal world we inhabit? How, in other words, does ‘our world’—which includes language and thought, society and self—emerge out of these systemic interactions and their long-term accumulative results?

Although we began by analyzing cognitive awareness in terms of the concomitance of sense-faculties and sense-objects, it should be clear that the developmental history of an organism determines more about its *present* cognitive processes than do the stimuli it responds to.⁷⁷ It is, after all, its particular cognitive capacities that specify its specific ‘cognitive domain.’ Complex organisms have, moreover, developed a reflexivity in which forms of cognitive awareness arise in response to stimuli that are internal to the organism itself, bringing forth an ‘inner environment’ that is as much a part of its total cognitive reality as any apparent external one.⁷⁸ In the complex nervous systems in human beings, in particular, this reflexivity eventually gave rise to a distinctive cognitive domain comprised of systems of intersubjective communication utilizing symbolic modes of expression, i.e., language.⁷⁹

In his sweeping book, *The Symbolic Species: The Co-evolution of Language and the Brain*, Terrence Deacon argues that what distinguishes human beings is not so much the size of our brains as its special mode of organization: human brains support systems of symbolic reference. Symbolic reference differs from other modes of reference:

⁷⁷ Oyama 2000, p. 38: “The impact of sensory stimuli is a joint function of the stimuli and the sensing organism; the ‘effective stimulus’ is defined by the organism that is affected by it.”

⁷⁸ “There are organisms that include as a subset of their possible interactions, interactions with their own internal states (as states resulting from external and internal interactions) as if these were independent entities, generating the apparent paradox of including their cognitive domain within their cognitive domain. In us this paradox is resolved by what we call ‘abstract thinking,’ another expansion of the cognitive domain” (Maturana and Varela 1980, p. 13). As Maturana points out (p. xxii), the notions of ‘inner’/‘internal’ and ‘outer’/‘external’ are not, strictly speaking, part of the direct phenomenological experience of an organism itself, but reflect a “metadomain of description” from a larger perspective that is itself based on the very reflexivity under discussion here.

⁷⁹ “At a certain level of complexity,” Capra observes, “a living organism . . . brings forth not only an external but also an inner world . . . linked intimately to language, thought, and consciousness” (Capra 1997, p. 270).

Because symbols do not directly refer to things in the world, but indirectly refer to them by virtue of referring to other symbols, they are implicitly combinatorial entities whose referential powers are derived by virtue of occupying determinate positions in an organized system of other symbols.⁸⁰

In other words, symbolic systems are self-referential in the same way as the classificatory systems we analyzed above are: their individual items are distinguished by the disjunctive differences between them,⁸¹ and interpreted in accordance with systemic patterns of relationship, i.e., grammar.⁸² Language, it is clear, is the mode of symbolic reference *par excellence*.

Our symbolic or linguistic capabilities did not, of course, spring fully formed out of the head of Zeus. They too are part of the accumulative, constructive and interactive processes of evolution whereby cognitive processes condition living structures, which in turn condition further cognitive processes and so on.⁸³ As symbolic communication ‘dependently arose’ in early hominid species it became a powerful evolutionary force in its own right, radically and irrevocably changing the structures and processes of the human brain.⁸⁴ This momentous change centered on our increasingly enlarged pre-

⁸⁰ Deacon 1997, p. 100.

⁸¹ Cf. Wittgenstein 1975, p. 317: “If, for instance, I say such and such a point in the visual field is *blue*, I not only know that, I also know that the point isn’t green, isn’t red, isn’t yellow etc. I have simultaneously applied the whole colour scale . . . It’s such a system which is compared with reality, not a single proposition” (*Philosophical Remarks*, Appendix 2, cited in Stern 1995, p. 99f).

⁸² Deacon elaborates: “[S]ymbols cannot be understood as an unstructured collection of tokens that map to a collection of referents because symbols don’t just represent things in the world, they also represent each other. . . . Because of this systematic relational basis of symbolic reference, no collection of signs can function symbolically unless the entire collection conforms to certain overall principles of organization. . . . [and] are organized so as to form a logically closed group of mappings from symbol to symbol. . . . Thus syntactic structure is an integral feature of symbolic reference, not something added and separate” (Deacon 1997, p. 99f). It is grammar that provides this organization.

⁸³ As Capra 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” (Capra 1997, p. 220).

⁸⁴ “It is simply not possible,” Deacon concludes, “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” (Deacon 1997, p. 409f).

frontal cortex, where such symbolizing processes are apparently concentrated.⁸⁵ As language use and this ‘prefrontalization’ mutually reinforced each other, the symbolic-linguistic mode of cognition which is dependent upon them came to dominate other, originally non-linguistic, processes. “Brain-language co-evolution has significantly restructured cognition from the top-down . . .,” Deacon argues, such that

its secondary effects have also ramified to influence the whole of human cognition. Human beings approach the world of sensory stimuli and motor demands differently from other species . . . even when our symbolic-linguistic abilities are uninvolved.⁸⁶

Human cognitive processes, even simple sensory ones, in other words, unavoidably arise in dependence upon our ‘linguistified’ brain. Language, then, along with the systemic distinctions upon which it depends, is not something added onto human cognitive processes. Systemic symbolic thinking is *constitutive* of nearly all normal human cognitive processes.⁸⁷

This prefrontalization of human cognition, however, is fraught with unintended consequences, consequences that follow from the very nature of linguistic symbolification. As classificatory systems based upon mutually dependent yet disjunctively defined terms, languages are largely conventional; they have no natural correspondence with their referents and hence never really ‘get at’ reality. Just as searching for the definition of a word in a dic-

⁸⁵ “[S]ymbol use itself must have been the prime mover for the prefrontalization of the brain in hominid evolution” (Deacon 1997, p. 336)

⁸⁶ Deacon 1997, p. 417; emphasis added. See also p. 265: “Prefrontal computations out-compete other cognitive computations and tend to dominate learning in us as in no other species. In simple terms, we have become predisposed to use this one cognitive tool whenever an opportunity presents itself, because an inordinate amount of control of the other processes in the brain has become vested in our prefrontal cortex. The way the parietal cortex handles tactile and movement information, the way the auditory cortex handles sound information, the way the visual cortex handles visual information, are all now much more constrained by prefrontal activity than in other species.”

⁸⁷ Geertz 1973, p. 49: “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.”

tionary leads only to other words, the meaning of a term in any symbolic *system* depends more upon other terms than on the ‘things’ themselves. The things themselves stand outside the system of symbolic reference, not in the superficial sense that symbols or words stand for something else, but in the deeper sense that what they stand *for* is primarily determined by *how* they function within the system as a whole.

Language is therefore not only a *result* of the long-term, interdependent feedback cycles of evolution. The self-referentiality of symbolic reference also inevitably gives rise to its own feedback cycles. “[S]ymbolically mediated models of things. . . ,” Deacon notes, “exhibit complicated nonlinearity and recursive structure as well as nearly infinite flexibility and capacity for novelty due to their combinatorial nature.”⁸⁸ Therefore, to the extent that organisms ‘specify their cognitive domains’ through their specific cognitive capacities, the cognitive domains of human beings are inescapably informed by the recursive and self-referential cycles of linguistic symbolification.⁸⁹ “We cannot help but see the world in symbolic categorical terms,” Deacon declares, “dividing it up according to opposed features, and organizing our lives according to themes and narratives.”⁹⁰ This linguistification of human cognitive processes thus represents a physiologically enstructured, dominating cognitive strategy characterized by compulsive yet creative recursivity, based upon words that are defined interdependently and systemically, rather than independently or substantively, and whose ultimate meanings are conventionally determined. No wonder Deacon ambivalently observes: “we are not just a species that uses symbols. The symbolic universe has ensnared us in an inescapable web.”⁹¹

⁸⁸ Deacon 1997, p. 434.

⁸⁹ Maturana and Varela 1980, p. 50: “Through language we interact in a domain of *descriptions* within which we necessarily remain even when we make assertions about the universe or about our knowledge of it. This domain is both bounded and infinite; bounded because everything we say is a *description*, and infinite because every *description* constitutes in us the basis for new orienting interactions, and hence, for new *descriptions*. From this process of recursive application of *descriptions* self-consciousness emerges as a new phenomenon in a domain of self-description, with no other neurophysiological substratum than the neurophysiological substratum of orienting behavior itself. The domain of self-consciousness as a domain of recursive self-descriptions is thus also bounded and infinite.”

⁹⁰ Deacon 1997, p. 416.

⁹¹ *Ibid.*, p. 436. A web, we might add, without a weaver. See also anthropologist Rappaport on language: “It would not, indeed, be an exaggeration to claim that humanity is [its] creation” (Rappaport 1999, p. 5).

Buddhist analyses of mind also connect reflexivity, and the linguistic categorizations associated with it, with cognitive processes (*viññāna*) that have been built up through the accumulating, epigenetic cycles of dependent arising. These are closely associated with ‘mental’ cognitive awareness (Skt. *mano-vijñāna*; Pāli *mano-viññāna*), the only cognitive modality not directly based upon a sense-faculty but upon the faculty of mind (*mano* or *manas*).⁹² Its 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 (Skt. *prapañca*; Pāli *papañca*) entailed by language use.

Mental cognitive awareness arises in conjunction with two kinds of events. First, the occurrence of any of the five forms of sensory cognitive awareness instigates a reflexive mental awareness of that initial awareness.⁹³ An awareness that something is blue, for example, arises (for most Indian Buddhist schools) in two discrete steps: first, a simple sensory awareness without ‘self-awareness’ arises, followed immediately by a mental cognitive awareness that is reflexively aware ‘that such and such a cognitive awareness has occurred.’⁹⁴

This reflexivity is closely related to speech, considered in early Indian thinking as the language of thought and ideas.⁹⁵ The second class of objects that instigates mental cognitive awareness, dharmas, thus includes reflection or thinking (both considered *samskāra* of speech, *vitakka-vicārā vacīsaṅkhārā*, M I 301), which arise in conjunction with mind (*manas*), the faculty that supports mental cognition.⁹⁶ The reflexivity that mental cognitive awareness

⁹² Derived from the Sanskrit root ‘*man*,’ “to think, believe, imagine, suppose, conjecture,” *manas* (Pāli *mano*) is related to the Latin ‘*mens*,’ “mind, reason, intellect,” and ultimately to the English “mind, mentation,” and “to mean” (PED, pp. 515, 520; SED, p. 783).

⁹³ “Friend, these five faculties each have a separate field, a separate domain, and do not experience each other’s field and domain, that is, the eye faculty, the ear faculty, the nose faculty, the tongue faculty, and the body faculty. Now these five faculties, each having a separate field, a separate domain, not experiencing each other’s field and domain, *have mind as their resort, and mind experiences their fields and domains*” (M I 295; Nāṇamoli 1995, p. 391).

⁹⁴ Although from a later period (5th century C.E.), the *Abhidharma-kośa* states that “visual-cognitive awareness is aware of blue, but not ‘that it is blue;’ mental cognitive awareness is aware of blue and aware ‘that it is blue’” (AKBh *ad* III 30c-d).

⁹⁵ See Reat 1990, p. 305: “Language was thought of as a discovery of the inherent conceptual relationships among things, so that from a very early period in Indian thought, conceptualization was regarded as primarily a verbal phenomenon.”

⁹⁶ SN 834 speaks of thinking on the views in the *manas* (*manasā dīṭhigatāni cintayanto*)

provides is therefore typically bound up with its linguistic capacities. But, like language itself, this tends to initiate endless rounds of recursivity, that is, *papañca* (*prapañca*), mental or conceptual proliferation.⁹⁷

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-sāṅkhā*] beset a man with respect to past, future, and present forms cognizable through the eye. . . . mind-objects cognizable through the mind.⁹⁸

In other words, what one cognizes, one apperceives; what one apperceives, results in conventional linguistic usage (*vohāra*),⁹⁹ which becomes a condition for further cogitation, conceptualization and mental proliferation, which in turn serve ‘as the source’ for more cognition and apperceptions regarding the objects of cognitive awareness, and so on.

Language, concepts and classification are thus not only inseparable from most processes of cognition, but they also give rise to a runaway recursivity in their own right, perpetuating our ‘inescapable web.’ Indeed, conceptual proliferation is so utterly entangled in its own reciprocal relationships—with (1) contact¹⁰⁰ (which sometimes conditions the arising of cognitive awareness), (2) apperception¹⁰¹ (which always accompanies it), and (3) thought

and S I 207 of the “reflective thoughts of *mano*” (*manovitaṅkā*). See Johansson 1965, pp. 183, 186.

⁹⁷ See Nāṇananda 1971 for a book-length treatment of this important concept in the early Pāli sources.

⁹⁸ M I 111f (Nāṇamoli 1995, p. 203). Translation altered for terminological consistency.

⁹⁹ As the Buddha said (A III 413): “Apperceptions (*saññā*), I say, result in conventional usage (*vohāra*). As one comes to know a thing, so one expresses (*voharati*) oneself, ‘Thus I have apperceived.’” Rhys-Davids’ *Pāli-English Dictionary* defines *vohāra* as “current appellation, common use (of language), popular logic, common way of defining, usage, designation, term.” *Vohāra* is equivalent to Sanskrit ‘*vyavahāra*.’

¹⁰⁰ A II 161: “Whatever is the range of the six spheres of contact, that itself is the range of prolific conceptualization. And whatever is the range of the prolific conceptualization, that itself is the range of the six spheres of contact” (Nāṇananda 1971, p. 21).

¹⁰¹ SN 874 states that “the series of prolific ideation is caused by apperception.” S IV 71

itself¹⁰²—that it is often a synonym for phenomenal, cyclic existence as a whole.¹⁰³

The most deeply entrenched source 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 text declares, the notion “‘I am’ is a proliferation; ‘I am this’ is a proliferation; ‘I shall be’ is a proliferation.”¹⁰⁴ Thus, not only is “the label ‘I,’” according to Bhikkhu Ñāṇananda, an “outcome of *papañca*,”¹⁰⁵ but the very thought ‘I am’ is also, according to the *Sutta-nipāta*, the root (*mūla*) of proliferation itself.¹⁰⁶ In other words, as long as the thought ‘I am’ persists, so long will endless cycles of apperceptions, conceptual proliferation and further apperceptions, and so forth, keep spinning.

This sense of self, however, derives its compelling cogency, its enduring and endearing allure,¹⁰⁷ from the same social and linguistic matrix other

says: “All men who have prolific ideation go on proliferating when apperceiving” (Johansson 1979, p. 192f).

¹⁰² Ñāṇananda describes the reciprocity between the series of proliferation-apperception, ‘*papañca-saññā-saṅkhā*’ (which he interprets (5) as “concepts, reckonings, designations or linguistic conventions characterised by the prolific conceptualizing tendency of the mind”) and thought (*vitakka*) itself: “the word or concept grasped as an object for ratiocination, is itself a product of ‘*papañca*’. This, in its turn breeds more of its kind when one proceeds to indulge in conceptual proliferation (*papañca*). Concepts characterised by the proliferating tendency (*papañca-saññā-saṅkhā*) constitute the raw-material for the process and the end product is much the same in kind . . . Thus there is a curious reciprocity between ‘*vitakka*’ [thought] and ‘*papañca-saññā-saṅkhā*’—a kind of vicious circle, as it were. Given ‘*papañca-saññā-saṅkhā*’, there comes to be ‘*vitakka*’ and given ‘*vitakka*’ there arise more ‘*papañca-saññā-saṅkhā*’” (Ñāṇananda 1971, p. 25).

¹⁰³ See Schmithausen 1987, p. 509ff, n. 1405, and p. 522ff, n. 1425.

¹⁰⁴ S IV 202f (Bodhi 2000, p. 1259).

¹⁰⁵ Ñāṇananda 1971, p. 11.

¹⁰⁶ “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; Ñāṇananda 1971, p. 34f). Translation altered slightly. (*kathaṃ disvā nibbāti bhikkhu anupādiyāno lokasmim kiñci. Mūlaṃ papañcasañkhāyāti Bhagavā mantā asmīti sabbaṃ uparundhe.*) Ñāṇananda takes ‘*mantā*’ as ‘thinker’ rather than thought.

¹⁰⁷ The Buddha gives the following 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).

words and symbols do: symbolic representation.¹⁰⁸ Like language, this symbolic self is a product of massive interdependency; like other relational phenomena, it has no substantive existence in time or space; and like all symbols, it appears simultaneously autonomous and disembodied. More idea than thing, this symbolic self is nothing if not virtual. “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.¹⁰⁹

Indian Buddhists could hardly have said it better. The irony, of course, is that this symbolic self is at the ‘root’ of proliferating ideation, the matrix of runaway recursivity in which, by all appearances, we all remain ensnared.

VII. The Cognitive Unconscious as Embodied Structuring of Experience

The theory of dependent arising and evolutionary biology, we have seen, both depict long-term co-evolutionary relationships through which certain cognitive processes gradually become ‘enstructured’ into physiological and psychological structures (*viññāna*, etc., condition *samskāra*s), structures which largely condition how subsequent forms of cognitive awareness may arise (*samskāra*s condition *viññāna*). And so it is with both language and the symbolic self that language enables. They are both complex results of interdependent processes which have, over time, become enstructured into enduring physiological and psychological structures, and which continuously influence the arising of cognitive awareness.

Like habits, such enstructuration is thought to occur for reasons of efficiency, which allows these processes to become increasingly automatic. Deacon declares:

¹⁰⁸ “Self-representation . . . ,” Deacon suggests, “could not be attained without a means for symbolic representation” (Deacon 1997, p.451). See also Nāṇananda 1971, p. 11: “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* . . . The ego notion is an extension in thought not faithful to facts.”

¹⁰⁹ Deacon 1997, p. 452.

It is the goal of most cognitive processes to make information processing unconscious and automatic—as quick, easy, and efficient as possible—because these sorts of processes take comparatively little in the way of neural representation and energy to manage, compared to the active adaptational processes we experience as consciousness.¹¹⁰

Think, for example, of the enormous complexity involved in a simple conversation: hearing, talking, breathing, moving, remembering the last few words, anticipating the next, parsing it all while simultaneously assessing emotional responses and observing body language, and so on.¹¹¹ All these processes are cognitive in the sense that they entail modulations, however slight, of the underlying neural and physiological structures of the organism. But they need not, indeed cannot, all result in or require conscious awareness. Most of them involve underlying neurological processes that have become ‘unconscious and automatic,’ only some of which lead to conscious awareness—both of which, however, must occur simultaneously, constantly informing and influencing the other, without which even simple conversation would be impossible.

We must distinguish, therefore, between those immediate but intermittent processes of discerning cognitive awareness accompanied by attention, and the underlying but continuous processes operating automatically. These latter are subliminal, arising outside of immediate conscious awareness. We must, therefore, analyze the arising of cognitive awareness into both *subliminal* as well as *supraliminal* dimensions.

This distinction was already intimated in the early Pāli texts in two distinct formulas for the arising of cognitive awareness:

Depending on eye and forms visual cognitive awareness arises.¹¹²

¹¹⁰ Deacon 1997, p. 456.

¹¹¹ In understanding speech alone, we are able to hear a continuous flow of sound, discern the discrete phonemes which, together, make up the specific words, a sufficient number of which must be held in short-term memory long enough to effectively parse their grammatical role within the sentence. The sentence itself subserves the larger rhetorical purposes of that speech act, which is itself embedded in a specific social or pragmatic context. All the while, we are also attentive to all the non-semantic, non-syntactic, yet nevertheless crucial communicative cues, such as changes in intonation, rhythm, word choice, hand and facial gestures, body language, etc. We are somehow aware of these all the time in any common conversation, despite the fact that *only one sound occurs at a time* (Lakoff and Johnson 1999, p. 10f).

¹¹² S II 73.

Depending on *saṅkhārā* (*saṃskārā*) cognitive awareness arises.¹¹³

It was left, however, to Indian Buddhists of the Yogācāra school (ca. 2nd–7th century C.E.), some fifteen centuries before Freud, to explicitly distinguish between the forms of supraliminal cognitive awareness (*pravṛtti-vijñāna*) that arise in conjunction with present stimuli accompanied by attention, and subliminal forms of cognitive awareness, subsumed under the term '*ālaya-vijñāna*' (roughly 'store-house' consciousness), that arise in conjunction with more enduring psycho-physiological structures (*saṃskārā*).¹¹⁴

This Buddhist 'cognitive unconscious,' however, is no more an experienter, agent or enduring subject than was cognitive awareness in the earlier model. It still has all the qualities and qualifications mentioned above: "it is related to the notion 'change' rather than to the notion 'object' . . . admit [ting] only news of difference,"¹¹⁵ it grows and develops through the accumulating, epigenetic processes of cyclic causality, and its cognitive domain constitutes a particular cognitive reality, a dependently arisen 'world of experience'. Specifically, it denotes a form of discerning subliminal awareness that arises from moment to moment in dependence upon specific kinds of stimuli, i.e., the enduring physiological and psychological structures (*saṃskārā*) whose ongoing processes underlie all sentient existence. Put the other way around, since these *saṃskārās* are continuously being modulated in the very processes of living, they provide the ever-present stimuli through which subliminal forms of awareness arise in each and every moment of life.¹¹⁶ In

¹¹³ S II 2.

¹¹⁴ 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 *saṃskārās* 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 [forms of] cognitive awareness comes about due to the sense-faculties, the sense objects and attention.'" This same distinction is also articulated by Maturana and Varela's theory, as described by Capra: "cognition involves two kinds of activities that are inextricably linked: the maintenance and continuation of autopoiesis and the bringing forth of a world" (Capra 1997, p. 268).

¹¹⁵ Bateson 1979, p. 121.

¹¹⁶ The *Pravṛtti-Portion* of the *Yogācārabhūmi*: "1.b) B.2. The [*ālaya-vijñāna*] always has an object, it is not sometimes this and sometimes that (**anyathātva*). However, from the first moment of appropriation [of the body at conception] for as long as life lasts (*yāvaj jīvam*) [its] perception (*vijñāpti*: T. '*rigs pa*') arises always having one flavor (*ekarasātvena*) [that is, homogeneously]. 1.b) B.3. It should be understood that the *ālaya-vijñāna* is momentary

this sense, and like simple *viññānas* before it, the *ālaya-viññāna* is virtually equated with the continuity of samsaric existence itself.

What are these structures that give rise to subliminal cognitive processes (*ālaya-viññāna*)? And how do they together continuously ‘specify a cognitive domain,’ gradually building up and ‘bringing forth’ our multi-dimensional world of human experience?

According to the *Samādhinirmocana Sūtra*, one of the earliest Yogācāra texts to elucidate this concept, this form of subliminal cognitive awareness,

the mind with all the seeds matures, congeals, grows, develops, and increases¹¹⁷ based upon the two-fold substratum¹¹⁸ (or: appropriation, *upādāna*); that is, (1) the substratum of the material sense-faculties along with their supports (**sādhiṣṭāna-rūpīndriya-upādāna*), (2) and the substratum which consists of the predispositions toward conceptual proliferation in terms of conventional usage of images, names, and conceptualizations.¹¹⁹

This dense passage recalls and rather formidably reformulates what we have just seen: that there is an intimate, and accumulating, relationship between

regarding [its] object, and though it arises continuously in a stream of instants, it is not unitary (*ekatva*)” (D.4a3–5; T.580a12–18).

¹¹⁷ 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: **(sarvabījakam cittam) vipacyate sammūrcchati vṛddhiṃ virūḍhiṃ vipulatām āpadyate*. This closely parallels passages found in Pāli texts, S III 53, D III 228: *viññāṇaṃ . . . viddhiṃ virūḍhiṃ vepullam āpajjeyya*. (Schmithausen 1987, p. 356, n. 508).

¹¹⁸ Comprised of the prefix ‘*upa*,’ ‘towards, near, together with,’ plus the noun ‘*ādāna*,’ “receiving, taking to oneself” (SED), *upādāna*, like *sāṅkhārā*, 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, p. 471; PED, p. 149. See also Schmithausen 1987, p. 72).

¹¹⁹ 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 his definition (Schmithausen 1987, p. 357, n. 511) 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” (Emphasis added).

bodily sensory awareness, conventional linguistic usage (*vohāra*),¹²⁰ and the runaway recursivity of *prapañca*, conceptual proliferation. Here, however, all these processes are said to be subtle and “difficult to discern (*duṣpariccheda*) even by the wise ones of the world.”¹²¹

This model articulates the underlying structures, the infrastructure as it were, through which all forms of cognitive awareness—both subliminal and supraliminal—are thought to arise. Elaborating on this, the *Yogācārabhūmi* describes how these predispositions (*vāsanā*) toward conceptual proliferation help bring forth a subliminal awareness of an ‘external’ world. 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, etc., bringing forth as its cognitive domain an ‘external world’ outside of immediate awareness.¹²² 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. This is, if I am not mistaken, nearly exactly the current notion of the ‘cognitive unconscious.’¹²³

As was suggested above, there must also be a continuous and simultaneously reinforcing relationship between sub- and supra-liminal cognitive processes in order for even ordinary human activities such as conversations to occur. This relationship, this ‘intrapyschic causality,’ if you will, is also

¹²⁰ See A III 413, quoted in note 99 above.

¹²¹ 1.b) B.1 (D.4a3–5; T.580a12–18) of the *Pravṛtti-Portion* of the *Yogācārabhūmi*. The mental factors associated with the *ālaya-vijñāna* are similarly subtle: “2.b) A. The *ālaya-vijñāna* is associated by association (*saṃprayoga*) with the five omnipresent factors connected with mind (*cittasaṃprayukta-sarvatraga*): attention (*manaskāra*), sense-impression (*sparśa*), feeling (*vedanā*), apperception (*saṃjñā*), and volitional impulse (*cetanā*) . . . 2.b) B. These dharmas, then, . . . are subtle (*sūksma*) because they are hard to perceive (*durvijñānatva*) even for the wise ones in the world” (D.4a3–5; T.580a12–18). See also TBh, 19.14–15, ASBh, 21.9f, Hakamaya 1979, p. 71, n. 6, 7, and Schmithausen 1987, p. 389f. for an extensive discussion of *aparicchinnā*.

¹²² *Pravṛtti-Portion* (D.3b7–4a3; T.580a2–12): “1.b) A.2. The ‘outward perception of the external world, whose aspects are undiscerned’ (*bahirdhā-aparicchinnākāra-bhājana-vijñāpti*) 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* [arises] 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.”

¹²³ Lakoff and Johnson 1999, pp. 9–15.

accumulative in the epigenetic sense we have already discussed, i.e., experience builds upon itself. That is, on the one hand, all supraliminal cognitive processes are said to *simultaneously* arise based on subliminal cognitive awareness (*ālaya-vijñāna*),¹²⁴ which arises on its own physiological and psycho-linguistic bases. In other words, our present experience is already continuously and simultaneously informed by the classifications implicit in all forms of cognitive awareness, which now, however, are seen to occur unconsciously and automatically. On the other hand, the arising of supraliminal cognitive awareness also continuously modulates or transforms the forms of unconscious cognitive awareness themselves, implanting ‘seeds’ (*bīja*) or ‘impressions’ (*vāsanā*) as the texts say,¹²⁵ which in turn condition the forms of supraliminal cognitive awareness, and so on. In modern terms, the neural networks that enable any specific form of conscious perception to occur are themselves always modified by repeated instances of those same types of perceptions. These reciprocally reinforcing and gradually accumulating processes, however, take place not only simultaneously, ceaselessly and mostly automatically, but also, in large part, unconsciously.

And, as our earlier analyses also suggest, if linguistic categories and classifications underlie all forms of cognitive awareness, subliminal as well as supraliminal, then we are susceptible to the same conceptual prolixity, the endless, ensnaring recursivity that language entails, at unconscious levels as well. Accordingly, our sense of self—enabled by and arising out of the reflexivity of linguistic and symbolic representation—has also become so enstructured that it, too, occurs ‘unconsciously and automatically’ in nearly every moment of mind. Specifically, this sense of self not only arises in reference to the ongoing forms of subliminal cognitive awareness (*ālaya-vijñāna*), but it is also associated with the linguistically expressed processes of conceptual thought:

¹²⁴ *Samdhinirmocana Sūtra*. Ch. 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* (*saniśritya pratihāya*) the appropriating cognitive awareness (*ādāna-vijñāna*) [a synonym of the *ālaya-vijñāna*].” The *Pravṛtti-Portion* of the *Yogācārabhūmi* (D. 6a4–6; T. 580c26–581a2): “4.b) B.1. The *ālaya-vijñāna* arises and functions simultaneously with the [forms of] arising cognitive awareness, too.”

¹²⁵ The *Pravṛtti-Portion* of the *Yogācārabhūmi* (D.5a3–7; T. 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 (*pravṛtti-vijñāna*)] [A.2.], and by [the

The mind (*manas*) whose mode (*ākāra*) is conceiving (*manyānā*) 'I-making' (*ahaṃkāra*), the conceit 'I am' (*asmimāna*), always arises and functions simultaneously with the *ālaya-vijñāna* . . . That [mind] has the mode of taking the *ālaya-vijñāna* as [its] object and conceiving [it] as 'I am [this]' (*asmīti*) and '[this is] I' (*aham iti*)."¹²⁶

We may now more fully appreciate the poignancy of our human condition, that inescapable web woven by nothing more than a 'virtual self,' the conceit 'I am.' As we have seen, the systemic classifications underlying all human cognitive processes have informed and instigated intentional activities that, in the long term, have been as instrumental in shaping the contours of human evolution as our more obvious physiological features. This linguistically-based symbolic self, unconsciously embedded and virtually real, has played no less a role in the coming to be of our entire 'world of experience.' This is because it is our behavior, the actions (*karma*) arising out of the dynamic interaction between (1) our physical embodiment, (2) the constructive influences of language, (3) our embedded sense of selfhood (all these being mostly subliminal), and (4) our supraliminal forms of cognitive awareness, that are most causally important, most effectively ensnaring. For these are indelibly informed by unconscious forms of self-grasping.

In commenting on the idea of unconscious predispositions of speech (*abhilāpa-vāsanā*), the commentary to the *Mahāyāna-saṃgraha* states that manifest cognitive awareness arises in regard to expressions of selves (*ātman*) and phenomena (*dharma*), and so on, due to the special power (*śakti-viśeṣa*) of the predispositions of conventional expressions (*vyavahāra*).¹²⁷ That is to say, the conventional expressions of everyday speech (*vyavahāra*), which delineate the world into innumerable discrete objects and categories, subtly condition the way in which awareness of those

pravṛtti-vijñānas] nurturing the seeds [B.1.], and [causing the *ālaya-vijñāna*] to grasp the seeds [of itself] [B.2]."

¹²⁶ The *Pravṛtti-Portion* of the *Yogācārabhūmi*, 4.b) A.1.(a). (D.5a7f; P.6a5f; T. 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-drṣṭi*), the conceit 'I am' (*asmimāna*), self-love (*ātmasneha*), and ignorance (*avidyā*)." See Schmithausen 1987, p. 444, ns. 944f.

¹²⁷ *ad* MSg I.58. U 397a24–b4; u 266b4–267a1; Bh. 336c5f; bh. 168b7f.

objects arises. The kinds of cognitive experiences people have, the categories of ‘things’ we see and touch, are indelibly influenced by the expressions and figures of speech to which we are habituated.

The most influential of these unconscious predispositions of speech is undoubtedly the view of self (*ātma-dṛṣṭi*), which accompanies all cognitive processes, continuously distinguishing self and other.¹²⁸ But, the *Yogācārabhūmi* warns, as long as one “is not freed from the bondage of perception in regard to phenomena (*nimitta*),” then so long will all our forms of cognitive awareness be influenced by these afflictive dispositions toward the sense “I am,”¹²⁹ colored by the discriminations between ‘self’ and ‘other.’ And insofar as these instigate karmically consequential actions, this ingrained self-view—virtual or not, unconscious or otherwise—will continuously perpetuate the cycle of samsaric existence, keeping us ensnared in the vicious cycle of dependent arising.

The symbolic self, in other words, although generated out of the vortex of the linguistic recursivity underlying all cognitive processes, from the unconscious level up, has compelling causal efficacy in its own right.¹³⁰ 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. In more modern terms, Deacon intimates the powerful punch this symbolic self effectively delivers:

As symbolic reference and symbolic minds co-evolved from the non-symbolic . . . so do the levels of self-representation that constitute our experience bring themselves into being in a moment-by-moment coevolutionary process. *As the symbolic process can be the co-author of our unanticipated brains, so can the symbolic self be the co-author of the component neural processes that support it.* We live in a world that is both entirely physical and virtual at the same time.¹³¹

¹²⁸ Ibid. Bh. 336c9f; bh 169a2: *gang gis bdag zhes bya ba dang / bzhan zhes bya ba'i bye brag 'dir 'gyur par byed do.*

¹²⁹ *Pravṛtti-Portion*, 4.b) A.2. (D. 5b4–6; T. 580c9–13).

¹³⁰ See Deacon 1997, p. 453: “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.”

¹³¹ Ibid., p. 454 ; emphasis added.

VIII. 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.

—Terrence William Deacon, *The Symbolic Species*

We now reach the last leg of our inquiry into the arising of the world of experience bereft of any external agents or internal subjects. Why, we must ask, if the 'world' co-arises with our cognitive systems, do we seem to live in so much the same world? How is it that we collectively 'bring forth' our shared world of human experience?

The short answer is, again, language; or rather, the common influences that language imparts on the activities, the karma, of human beings which, in turn, bring about common results. 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," one that evolved "*neither inside nor outside brains, but at the interface where cultural evolutionary processes affect biological evolutionary processes.*"¹³² That is, we have similar kinds of cognitive processes because they developed historically through continuous interaction between human beings, giving rise to our common bodily forms with our species-specific propensities toward cultural and social conditioning, and the dominating influences of linguistic classification, conceptualization, nominalization, and so forth, 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. Indeed, in one sense, this merely articulates the social, cultural and biological dimensions already implicit in the theory of dependent arising. But it took some one thousand years after the time of the Buddha for these implications to become explicit within Indian Buddhist thought. Again, it is the *Mahāyāna-saṃgraha* (MSg) of Asaṅga which explicitly articulates the connections between the social nature of language, its common influences upon human behavior, and the similarities of 'worlds' which result therefrom.

MSg I.60 states that the subliminal form of cognitive awareness (*ālaya-vijñāna*) which subliminally 'brings forth a world' based upon the predis-

¹³² Deacon 1997, p. 409f.

positions to categorization, etc., exhibits both shared or common and uncommon aspects:

The common [characteristic of the *ālaya-vijñāna*] is the seed of the receptacle world (*bhājana-loka*). The uncommon [characteristic of the *ālaya-vijñāna*] is the seed of the individual sense-spheres (*prātyātmikāyatana*).

In most Indian Buddhist traditions, indeed in ancient India in general, this ‘receptacle’ world in which we all dwell arises from the accumulated actions (*karma*) of numberless sentient beings.¹³³ Asaṅga elaborates on this, stating that it is the *common and uncommon actions* of sentient beings that create the inanimate (*bhājana-loka*) and animate worlds (*sattva-loka*) respectively,¹³⁴ while the commentary to the MSg comments that without this shared aspect of subliminal cognitive awareness (*ālaya-vijñāna*), there could be no receptacle world which is the basis for the shared usage of animate beings.¹³⁵ At first blush, this may seem rather farfetched, but it is well in accord with the terms of our earlier analyses. Moreover, the sense that the similar cognitive domains of sentient beings ‘bring forth’ a common world was already deeply implicit in the Buddhist notion of karma. It is the common influences of language that hold these all together.

The commentary to this text 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*.¹³⁶

¹³³ AKBh. *ad.* IV 1.a. (Shastri, p. 567; Poussin, tome 3, p. 1: *sattvānām karmajam lokavai-citryam*). Also *ad.* II 56b, 57b. For the early Vedic sense of *loka* as a multidimensional ‘world’ constructed by human action, particularly ritual action, see Collins 1982, pp. 43–45.

¹³⁴ The term *sādhāraṇa* here means “having or resting on the same support or basis” (SED, p. 1202).

¹³⁵ Bh 337a28ff; bh 169b5. See also the *Pravṛtti-Portion* of the *Yogācārabhūmi*, I.5.b) A.1–3, where the *ālaya-vijñāna* is considered the root of the inanimate and animate worlds coming into existence.

¹³⁶ *ad.* MSg I.60, U 397c12f; u 267a8–268a1.

Simply put, our ‘world’¹³⁷ appears to us in similar ways because we have similar karma to experience it similarly. But to what extent do our actions make this ‘experienced world’ similar? And how or why do we come to have similar karma?

In general, this simply unpacks part of what karma means in the classical Indian world-view: similar actions lead to similar results. All members of the same species are born into similar kinds of bodies which are largely brought about by past karma, by the structural transformations incurred from innumerable past actions. Since our bodies are similar, the actions, the karma they resulted from, are also similar. And since these similar bodies have similar cognitive structures, which both facilitate and circumscribe what we can normally see, feel and think, they ‘bring forth’ a common cognitive domain, a human ‘world’ that is distinguished, for example, from that of cats, bats or gnats. In other words, our common ‘world’ is produced by our common causal history, embodied in the similar structures and processes of our cognitive capacities. As the commentary states, “perceptions appear similarly to all who experience them . . . in accordance with their own similar karma.”

These species-specific cognitive structures include, quite prominently, an ‘extra-biological inheritance’ that arose “neither inside nor outside brains, but at the interface where cultural evolutionary processes affect biological evolutionary processes,” i.e., language. It is language that provides the means whereby 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 common focus for similar kinds of cognitive processes to arise, processes that tend to provoke similar responses¹³⁸ which, in turn, typically give rise to similar results. That is,

¹³⁷ Johansson (1979, p. 28f) has collected numerous passages that equate ‘the world’ (*loka*) with the ‘world of experience’: SN 169: “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 the six;” A II 48: “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 IV 430: “These five love-objects (*kāmaguṇā*) 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;” S I 39: “The world is brought up by the mind, swept away by the mind;” A II 49: “there is no release from suffering without reaching the end of the world.”

¹³⁸ That the arising of consciousness, and the train of responses that follow, occur in discernible patterns is the gist of the series of dependent arising in general, as well as of many of the specific factors in particular.

actions that are informed and instigated by similar conditions and similar intentions give rise, over the long term, to a similar world. And this is the similar world in which we are ‘ensnared.’

It is just because our cognitive structures are constituted by linguistic predispositions that cognitive awareness is always subject to language’s endless recursivity (*prapañca*). The ‘predispositions or impressions of speech’ (*abhilāpa-vāsanā*), which have the ‘special power’ (*śakti-viśeṣa*) to give rise to manifest cognitive awareness (*vijñāna*) in regard to expressions of selves (*ātman*), dharmas, and actions, etc. 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,*” without which, the text continues, “the new arising of the impressions of language would be impossible.” In other words, this linguistic recursivity is the generative matrix from which endlessly springs forth our symbolic world, one that virtually supercedes the physical world we appear to inhabit.¹³⁹

The reciprocal feedback processes that language invites thus operate at 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. What the MSg is now describing is a third, unconscious yet thoroughly *intersubjective* feedback system, which, like the other two dimensions of circular causality, continuously proliferates and perpetuates samsaric existence, but, unlike them, bridges the individual and collective experience of the ‘world,’ connecting our similar karmic activities with the similar ‘worlds’ these activities bring about.¹⁴⁰

Since the recursivity that symbolic communication facilitates is “intrinsically social,” and has evolved “neither inside nor outside brains,” then our commonality of worlds, dependent upon our common species-specific cognitive structures, is ultimately inseparable from our commonality of cognitive awareness, dependent upon our common linguistic, symbolic structures. That is, Deacon declares, since,

symbolic reference is at once a function of the whole web of inferential relationships and of the whole network of users extended in

¹³⁹ See note 89 above.

¹⁴⁰ It is the “unbounded” nature of symbolic media, in Deacon’s terms, that “gives us the ability to share a virtual common mind.” (Deacon 1997, p. 427).

space and time . . . 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.¹⁴¹

These mostly indiscernible processes both reflect and reinforce the cultural, social, and cognitive worlds we inhabit, not just as individuals but even more importantly as social beings, since “language is a primary medium through which humans inhabit their world.”¹⁴² Indeed, languages are like habitats, because they give rise to the inexhaustibly proliferating processes (*prapañca*) of classification and conceptualization (*vikalpa*) through which we habitually, nearly unavoidably and mostly unknowingly engage, construct and perpetuate the ‘world’ which simultaneously sustains and ensnares us. It is our 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 inhabit. And, this, we suggest, is as true for some twentieth-century evolutionary biologists and neuroscientists as it was for fifth-century Yogācārin Buddhists.

It further suggests, we venture, that we all have a larger share in the common construction of our ‘world’ than we commonly realize. For if we are not actually trapped inside our heads, but are causally as well as cognitively intersubjective through and through, it matters a great deal which particular concepts, categories and classifications we produce, proclaim and protect. We can and must strive, that is, to collectively unravel the “common bonds” (*sādhāraṇa-bandhana*) that ensnare us, “difficult to cut (*duṣheya*) and difficult to fully comprehend (*duṣparijñeya*)”¹⁴³ though they may be. It would make a world of difference.

¹⁴¹ Deacon 1997, p. 452f.

¹⁴² Paden 1992, p. 7.

¹⁴³ MSg I.60.

REFERENCES

Abbreviations and Primary Sources

- A *Āṅguttara Nikāya*. London: Pali Text Society. 1885–1910. Woodward, F.L. and Hare, E.M., trans. 1932–36. *The Book of the Gradual Sayings*. London: Pali Text Society. Cited by collection and page number of Pāli text. Also, Nyanaponika Thera and Bhikkhu Bodhi, trans. 1999. *Numerical Discourses of the Buddha: An Anthology of Suttas from the Āṅguttara Nikāya*. Walnut Creek, CA: AltaMira Press.
- Abhidhammattha-sangaha*. See *Compendium*.
- AKBh *Abhidharmakośabhāṣya*. Shastri, S. D., ed. 1981. Varanasi: Bauddha Bharati Series. Cited by chapter and verse.
de La Vallée Poussin, Louis. French trans. 1971. *L' Abhidharmakośa de Vasubandhu*. Bruxelles: Institut Belge des Hautes Études Chinoises.
Pruden, Leo M., English translation of Poussin's Fr. trans. 1990. Berkeley: Asian Humanities Press. Cited by volume and page numbers.
- Apte Apte, Vaman Shivaram. 1986. *The Practical Sanskrit-English Dictionary*. Reprint: Kyoto: Rinsen Book Co.
- ASBh *Abhidharmasammucaya-bhāṣyam*. Tatia, Nathamala, ed. 1976. Patna: K.P. Jayaswal Research Institute.
- Bh *Mahāyānasamgraha-bhāṣya*, Chinese translation. T.#1597.
bh *Mahāyānasamgraha-bhāṣya*, Tibetan translation. P.#5551; D.#4050.
- BHSD *Buddhist Hybrid Sanskrit Dictionary*. Edgerton, Franklin. Reprint: Kyoto: Rinsen Book Co.
- Compendium*. Aung, Shwe Zan, trans. 1979. *Compendium of Philosophy (Abhidhammattha-sangaha)*. London: Pali Text Society. (Revised translation and edition: *A Comprehensive Manual of Abhidhamma*. 1993. Trans. by Nārada; rev. by Bhikkhu Bodhi. Kandy: Buddhist Publication Society).
- D *Dīgha Nikāya*. London: Pali Text Society. 1890–1911. Rhys-Davids, T.W. and C.A.F., trans. 1899–1921. *Dialogues of the Buddha*. London: Pali Text Society. Cited by collection and page number of Pāli text. Walshe, L. 1987. *Thus Have I Heard*. Boston: Wisdom Books.
- D. Derge edition of the Tibetan *Tripitaka*.
- Das Das, Chandra. *Tibetan-English Dictionary*.
- M *Majjhima Nikāya*. London: Pali Text Society. 1948–51. Horner, I. B., trans. 1954–59. *Middle Length Sayings*. London: Pali Text Society. Cited by collection and page number of Pāli text. Nāṇamoli 1995. *The Middle Length Discourses of the Buddha*. Boston: Wisdom Books.
- Kathāvatthu*. London: Pali Text Society. 1979.
- Mathews. *Mathews' Chinese-English Dictionary*.
- MSg *Mahāyānasamgraha*, T.#1594; P.#5549; D.#4048. Cited by chapter number and section.

- Miln. *Milinda's Questions*. Horner, I.B., trans. 1963-64. London: Pali Text Society. Cited by page numbers of translation and Pāli text in brackets.
- P. Peking edition of the Tibetan *Tripitaka*.
- PED *Pāli-English Dictionary*, Rhys-Davids, T.W. and Stede, W., ed. 1979. London: Pali Text Society.
- Poussin See AKBh.
- Pravṛtti Portion*. Part of the *Yogācārabhūmi*. T.30 (#1579).579c23-582a28; P.#5539 Zi.4a5-11a8; D.#4038 Shi.3b4-9b3. Cited by page number and outline as found in Hakamaya 1979.
- Proof Portion*. Part of the *Yogācārabhūmi*, which is also found in ASBh 11,9-13,20; T.31(#1606).701b4-702a5; P.#5554 Si.12a2-13b5; D.#4053 Li.9b7-11a5. Cited by page and proof number.
- S *The Connected Discourses of the Buddha*. 2000. Translated by Bhikkhu Bodhi. Somerville: Wisdom Pub. *Samyutta Nikāya*. 1894-1904. London: Pali Text Society. Rhys-Davids, C.A.F. and Woodward, F.L., trans. 1917-30. *The Book of the Kindred Sayings*. London: Pali Text Society. Cited by collection and page number of Pāli text.
- Samdhinirmocana Sūtra*. Lamotte, Étienne, ed. and trans. 1935. *Samdhinirmocana Sūtra. L'Explication des Mystères*. Louvain. Cited by chapter and section.
- SED *Sanskrit-English Dictionary*. Monier-Williams. 1986. Reprint: Tokyo: Meicho Fukyūkai.
- Shastri See AKBh.
- SN *Suttanipāta*. London: Pali Text Society. 1948. H. Saddhatissa, trans. 1985. London: Curzon Press.
- T Taishō edition of the Chinese *Tripitaka*.
- TBh *Trīṣṭikābhāṣyam* of Sthiramati, in Lévi, Sylvain., ed. 1925. *Vijñaptimātratāsiddhi: Deux Traités de Vasubandhu*. Paris: H. Champion.
- U *Upanibandhana of Asvabhāva*. Chinese translation of commentary on MSg. T.#1598.
- u *Upanibandhana of Asvabhāva*. Tibetan translation of commentary on MSg. P.#5552; D.#4051.
- Visuddhimagga. The Path of Purification*. Buddhaghosa. Nānamoli trans. 1976. Berkeley: Shambala. Cited by chapter and paragraph.
- Yogācārabhūmi*. Bhattacharya, ed. 1957. Calcutta: University of Calcutta. See also *Pravṛtti and Proof Portions*.

Secondary Materials:

- Aramaki, Noritoshi. 1985. "The Short Prose Pratīyasamutpāda." In *Buddhism and its Relation to Other Religions*. Kyoto: Heirakuji Shoten, pp.87-121.
- Barash, David. 1979. *The Whisperings Within: Evolution and the Origin of Human Nature*. New York: Harper & Row.
- Bateson, Gregory. 1979. *Mind and Nature: A Necessary Unity*. New York: Bantam Books.
- Bodhi, Bhikkhu. 1993. *A Comprehensive Manual of Abhidhamma*. Kandy: Buddhist Publication Society.

WALDRON: BUDDHIST STEPS TO AN ECOLOGY OF MIND

- Capra, Fritjof. 1997. *The Web of Life: A New Scientific Understanding of Living Systems*. New York: Anchor Books.
- Carrithers, Michael. 1992. *Why Humans Have Cultures*. New York: Oxford University Press.
- Collins, Steven. 1982. *Selfless Persons: Imagery and Thought in Theravada Buddhism*. Cambridge: Cambridge University Press.
- Conze, Edward. 1967. *Materials for a Dictionary of the Prajñāpāramitā Literature*. Tokyo: Suzuki Research Foundation.
- Deacon, Terrence William. 1997. *The Symbolic Species: The Co-evolution of Language and the Brain*. New York: W.W. Norton & Co.
- Geertz, Clifford. 1973. 'The Impact of the Concept of Culture on the Concept of Man.' *The Interpretation of Cultures*. New York: Basic Books.
- Gombrich, Richard Francis. 1996. *How Buddhism Began: The Conditioned Genesis of the Early Teachings*. Jordan Lectures 1994. Atlantic Highlands, N.J.: Athlone Press.
- Hakamaya, Noriaki. 1979. 'Viniścayasamgrahaṇi ni okeru āraya-shiki no kitei.' *Tōyō bunka kenkyūjo-kiyō* 79, pp. 1–79.
- Harland, Richard. 1987. *Superstructuralism: The Philosophy of Structuralism and Post-structuralism*. London: Routledge.
- Johansson, Rune Edvin Anders. 1965. "Citta, Mano, Viññāṇa—A Psychosemantic Investigation." *University of Ceylon Review*, vol. 23, nos. 1 & 2, pp. 165–215.
- . 1979. *The Dynamic Psychology of Early Buddhism*. London: Curzon Press.
- Lakoff, George and Mark Johnson. 1999. *Philosophy in the Flesh: The Embodied Mind and its Challenge to Western Thought*. New York: Basic Books.
- Lewontin, Richard C. 1983. 'The organism as the subject and object of evolution.' *Scientia* 118, pp. 63–82.
- . 2000. *The Triple Helix: Genes, Organism, and Environment*. Cambridge: Harvard University Press.
- Maturana, Humberto R. and Francisco Varela. 1980. *Autopoiesis and Cognition: The Realization of the Living*. Dordrecht, Holland: D. Reidel Pub. Co.
- Ñānamoli, Bhikkhu. 1995. *The Middle Length Discourses of the Buddha: A New Translation of the Majjhima Nikāya*. Boston: Wisdom Publications.
- Ñānananda, Bhikkhu. 1971. *Concept and Reality in Early Buddhist Thought: An Essay on Papañca and Papañca-saññā-sankhā*. Kandy: Buddhist Publication Society.
- Nyanatiloka. 1977. (1980) *Buddhist Dictionary: Manual of Buddhist Terms and Doctrines*. Colombo: Frewin & Co. Ltd. Reprint: San Francisco: Chinese Materials Center, Inc.
- Oyama, Susan. 2000. *The Ontogeny of Information*. 2nd ed. Duke University Press.
- Paden, William E. 1992. *Interpreting the Sacred: Ways of Viewing Religion*. Boston: Beacon Press.
- Piatigorsky, Alexander. 1984. *The Buddhist Philosophy of Thought: Essays in Interpretation*. London: Curzon Press.
- Popper, Karl R. 1952. *The Open Society and its Enemies*, 2nd (revised) ed., 2 vols. London: Routledge & K. Paul.
- . 1974. *Conjectures and Refutations*. 5th ed. London: Routledge & K. Paul.
- Rahula, Walpola. 1959. *What the Buddha Taught*. New York: Grove Press.

- Rappaport, Roy A. 1999. *Ritual and Religion in the Making of Humanity*. Cambridge: Cambridge University Press.
- Reat, N. Ross. 1990. *Origins of Indian Psychology*. Berkeley: Asian Humanities Press.
- Restak, Richard M. 1994. *The Modular Brain: How New Discoveries in Neuroscience are Answering Age-old Questions about Memory, Free Will, Consciousness, and Personal Identity*. New York: Touchstone Books.
- Rose, Steven P. R. 1997. *Lifelines: Biology Beyond Determinism*. New York: Oxford University Press.
- Saussure, Ferdinand de. 1959. *Course in General Linguistics*. Ed. by Charles Bally and Albert Reidlinger. Trans. by Wade Baskin. New York: The Philosophical Library.
- Stern, David G. 1995. *Wittgenstein on Mind and Language*. New York: Oxford University Press.
- Schmithausen, Lambert. 1987. *Ālayavijñāna: On the Origin and Early Development of a Central Concept of Yogācāra Philosophy*. Tokyo: International Institute for Buddhist Studies.
- Tooby, John and Leda Cosmides. 1992. "The Psychological Foundations of Culture," in Jerome H. Barkow, Leda Cosmides, John Tooby. 1992. *The Adapted Mind: Evolutionary Psychology and the Generation of Culture*. New York: Oxford University.
- Varela, Francisco J., Evan Thompson, and Eleanor Rosch. 1991. *The Embodied Mind: Cognitive Science and Human Experience*. Cambridge, Mass.: MIT Press.
- Waldron, William. 2000. "Beyond Nature/Nurture: Buddhism and Biology on Interdependence." *Contemporary Buddhism*. Vol.1, No. 2 (Nov. 2000), pp. 199–226.
- Wiener, Norbert. 1950. *The Human Use of Human Beings; Cybernetics and Society*. Boston: Houghton Mifflin.
- Wittgenstein, Ludwig. 1953. *Philosophical Investigations*. Tran. by G.E.M. Anscombe. Oxford: Basil Blackwell.
- . 1975. *Philosophical Remarks*. Ed. from his posthumous writings. Oxford: Basil Blackwell.