The Co-arising of Self and Object, World, and Society: Buddhist and Scientific Approaches

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> The mind is neither within nor without, nor is it to be apprehended between the two.
> *Vimalakīrti-nirdeśa-sūtra* (30).

The ways in which the relationship between mind and world have been considered for the last few hundred years in Western thought and science are being radically reconceived and ideas from a wide variety of sources are now being taken more seriously than ever. Philosophical perspectives from the Buddhist traditions of India are of particular interest because they have long addressed issues that are currently in contention: if we are not Cartesian subjects essentially alienated from our bodies and the material world, as many have previously accepted, then who and what are we? And what then is the status of the "world" we purportedly stood against? Or our perceptions of it? Or the consequences of actions within it? And if the line between self and world is not nearly as clear or hard and fast as we have assumed, where or what is it?

We propose to address such questions by considering a wide range of ideas from Indian Buddhist traditions and various scientific fields. We shall find thinkers in both areas who have reached surprisingly similar conclusions on a number of key issues: they similarly conclude that (1) the "self" is a designation for interactive processes rather than the name of an autonomous entity, and (2) that cognitive awareness only arises as a result of interaction between subject and object, which are themselves, however, (3) ultimately inseparable.[1] These conclusions lead them to the counter-intuitive idea that (4) such awareness occurs neither solely inside nor wholly outside of the brain, but only at the interface of "self" and world. We are further surprised when we find thinkers in both these areas who therefore (5) understand the "world" as necessarily correlative with specific organisms or species, and then (6) go on to suggest similar causal patterns—i.e. circular causality—whereby these "worlds" and species-specific awareness of them concomitantly come about (i.e. they co-evolve), (7) disclosing, for our human "world," the indispensable influences of language and society. And, finally, we are astonished to discover that some Buddhists and scientists agree that our sense of self, object, world, and society, (8) not only occurs mostly automatically and unconsciously, but also necessarily (9) includes the whole network of language users, past and present, leading them, at last, to (10) concur with the epigraph above that, at least for man, mind "hath no place to lay its head."

That these views are even comparable only becomes clear when they are seen in light of one another. That is, the startling implications of various scientific understandings of perception, world and mind, could easily be overlooked if they were examined one by one, without the perspective that a well-developed and integrated world view such as Indian Buddhism provides.[2] Conversely, the relevance, and oft-times even the import, of basic Buddhist ideas could be

occluded without the fresh perspectives that scientific inquiries into the arising of awareness provide.

We will pursue this mutual edification of Buddhist and scientific understandings of mind and world by pursuing a single line of inquiry to its logical, if vertiginous, conclusion: the idea that awareness arises in dependence upon an ultimately indefinite range of causes and conditions and is therefore a function neither of the subject by itself nor of the world alone. In this light, we shall see that our selves, our worlds, and our minds can be understood more fully and more deeply if we consider them not as autonomous entities originally existing apart from each other and only subsequently coming together, but rather as aspects of recurrent *patterns of interaction*s that concurrently arise.[3] The objects of such analyses, in other words, are not really *objects* at all, but specific, recurrent relationships. This perspective is most succinctly stated in the classical Buddhist formula of dependent arising (*paṭicca-samuppāda*):

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

This shift in focus—reframing questions from "who did what to whom?" to "how do interactive processes come to occur?"—replaces the implicit metaphysics[4] of autonomous agents acting upon independent objects with a view of the complex and patterned arising of phenomena. This alone largely explains one of the most overlooked similarities between scientific and Buddhist modes of inquiry: that in their common attempt to understand not the essence but the arising of things, they have both found it *necessary* to dispense with the notions of substantive entities, unchanging essences[5] or independent agents altogether.[6] This is a momentous shift entailing ever-widening implications. We shall gradually draw out these implications by examining three aspects of interdependence: between self[7] and object, self and world, and self and society.[8]

Interaction

Visual experience perhaps best illustrates this shift from substance to process, from things to relations; it is certainly the most thoroughly studied of the five modes of sensory perception.[9] The examination of vision, though, whose apparent externality would most seem to secure our sense of a truly objective reality, ironically undercuts our everyday view of the world. For when we analyze the perceptual processes, we cannot find awareness either in an isolated subject apart from its object nor in an object apart from some subject.[10] Most Indian Buddhists and many cognitive scientists therefore conclude that we can ordinarily[11] only apprehend perceptual awareness as it arises *in conjunction* with its respective objects.

The prototypical Buddhist analysis of perception was expressed by the Buddha himself

some 2,500 years ago: "Apart from conditions there is no arising of cognitive awareness" (M I 258). The most important conditions that Buddhists delineated are the sense faculties (*indriya*) and their correlative objects, as in this standard application of the formula of dependent arising: "visual cognitive awareness arises dependent on the eye and visual form" (S II 73). It is clear even in this simple formulation that "cognitive or perceptual awareness" (or, more commonly, "consciousness"; Pāli: *viññāṇa*; Sanskrit: *vijñāna*) is *not* a faculty that actively cognizes objects, as it is in most philosophical traditions.[12] Rather, cognitive awareness is seen as the result of the interaction, or more precisely, the concomitance of a specific sense faculty[13] and its correlative object. Different modalities of cognitive awareness thus arise when different kinds of objects—five sensory and one mental—enter the cognitive range of, and thereby impinge upon, their respective sense faculties, provided that attention is present.[14] It is, in short, a process that occurs rather than an agent that acts.

An analysis of cognition as an interactive process is also advanced by many cognitive scientists. Lakoff and Johnson, for example, analyze color perception in exactly these terms.[15] "Color," they declare, "is not a thing or a substance out there in the world." Instead, it

> arise[s] from the interactions of our bodies, our brains, the reflective properties of objects, and electromagnetic radiation. Colors are not objective; there is in the grass or the sky no greenness or blueness independent of retinas, color cones, neural circuitry, and brains. Nor are colors purely subjective; they are neither a figment of our imaginations nor spontaneous creations of our brains… Rather, color is a function of the world and our biology interacting. (Lakoff and Johnson, 1999, 24-5)

If we take vision as paradigmatic of perception in general, then we may concur with Lakoff and Johnson that perceptual awareness is "neither purely subjective nor purely objective" (*ibid*., 25). It is a function neither of the faculties by themselves nor of their objects alone, as idealism or realism would suggest, respectively.[16] Rather, as in the Buddhist analysis earlier, perceptual awareness is a result of the interaction between sense faculties and their correlative objects. This notion—that cognitive awareness arises only with the coming together of "the world and our biology"—will serve as our conceptual point of departure and our recurrent *leifmotif*. First, biology.

Sensory Cognition

It is prosaic, perhaps even tautological, to note that knowledge depends upon a means of knowledge. We can only perceive what our organs and faculties enable us to perceive, and this in turn depends upon the kind of stimuli their physical structures are capable of responding to. This is what a "correlative object" means: a "visible object" is precisely that which can impinge upon the visual organ and elicit visual awareness. This appears to invert the usual roles of subject and object, though, because now it is not the objects that determine the form of sensory awareness, but rather the sensory capacities that determine the "object," that determine *what kind* of phenomena

can even become a cognitive object.[17] Human eyes, for example, do not respond to ultra-violet or infra-red light, nor can most of us hear a dog whistle; we are blind and deaf to what other species can see and hear. In this fashion, just as our analysis of color perception undermines our sense that colors truly exist "out there," so too does an analysis of sensory awareness undermine the sense that we experience objects "out there." This merits further discussion.

According to many analyses, sense organs only function when the stimuli impinging upon them reach a certain threshold, triggering impulses in the receptor neurons that, via various mediating processes, register in the cortex.[18] When sufficiently strong, these result in a form of perceptual awareness. A number of implications follow from this simple process. First, the entire process is temporal; it is an event. By definition, a stimulus is something that evokes a *change* in the sense organ,[19] distinguishing it from its preceding state. And second, whatever stimulus leads to perceptual awareness is necessarily distinguished from its surrounding context. We do not, for example, normally notice subtle stimuli like the quick flicker of a fluorescent light or ambient stimuli like the steady hum of a fan since they are either too rapid or too regular to trigger our awareness—until there is a change. We only notice it when the hum stops. Similarly, if everything in our visual field were completely white (or completely black) nothing would be distinguishable from anything else and we would be effectively blinded, as in the blizzard condition called a "white-out." The arising of perceptual awareness thus depends upon the effervescent contrasts, the shifting *temporal and contextual distinctions* that disjunctively constitute stimuli, not upon some solitary stimulus existing in splendid isolation.

It appears then that the objects of our sense organs are not really objects at all; they only appear to be. This is tellingly illustrated in experiments tracing people's eyes as they scan a photograph. The eyes do not dwell on the "objects" in the picture, but follow their outlines, where the greatest contrasts lie. As Gregory Bateson (1979, 107) explains, "the end organs [of sense] 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*." This then suggests a third point: that our everyday awareness of the world, what we see and hear and touch and smell, critically depends upon the distinctions our sense faculties are *capable* of "drawing"—indeed, the world ordinarily only appears in the forms they draw.

In this sense, cognitive awareness is both categorical and constructive. First, the receptor neurons of the sense organs, according to cognitive scientist, Christine Skarda (1999, 85), are "stimulus-specific in terms of their response characteristics. Each responds maximally (i.e. with a burst of intense electrical activity) to a specific type or class of stimuli," such as certain wavelengths or intensities of light, temperature, sound, etc. Even putatively "pure sensations" depend upon the elementary schemas that constitute the responsive structure of the sense organs. This initial process, however, only yields isolated neurological signals that at this stage do not yet amount to identifiable objects or characteristics.[20]

The features or categories that we actually experience, such as red or blue or hot or cold, are constructed in the next stage, the post-receptor level of neural processing. At this level the

isolated signals from the receptor neurons are effectively juxtaposed, so that specific features become distinguishable. In this sense, Skarda continues, "features are dependent phenomena. Every feature acquires its unique nature as a feature *in a process of contrast*... Different frequencies of light acquire their unique color characters from being contrasted with one another" (*ibid*., 86f; emphasis added). When red is perceived in contrast with blue, for example, it is subtly different than when it is perceived in contrast with green. The distinctive features we perceive therefore neither exist in complete isolation from each other, for they are only distinguished contrastively, nor do they directly correspond with some "pure sensation," since they are also the end result of a series of complex, constructive neurological processes.[21] Neurophysiologist, Walter Freeman, explains this last point:

> The only patterns that are integrated into the activities of the brain areas to which the sensory cortices transmit their outputs are those patterns they have constructed within themselves.... They are not direct transcriptions or impressions from the environment inside or outside the body. All that brains can know has been synthesized within themselves, in the form of hypotheses about the world. (2000, 90).

This is crucial. Our sense organs are triggered by certain "*classes* of stimuli," which in turn only become perceivable features when they are contrastively distinguished. Lakoff and Johnson (1999, 18f.) thus conclude that such constructive "categorization is a consequence of how we are embodied.... it is an inescapable consequence of our biological makeup.... 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." Perceptual experience, in this view, is a function of the classificatory schemas our nervous systems necessarily embody and unavoidably employ. Our everyday "world" appears *already formed* by the categories that allow perception to occur in the first place.

These intriguing analyzes, at the cutting edge of cognitive science, parallel Buddhist analyses of perception in a number of ways; in particular, Buddhists also analyze perception as involving both disjunctive and constructive processes, both differentiation as well as synthesis. First, as we have seen, Indian Buddhists considered perceptual awareness as a distinctive temporal event which occurs when certain requisite conditions come together, specifically, when an unimpaired sense organ is impinged upon by an appropriate object within its respective sense-field (*gocara*) and attention is present. The term translated as "cognitive awareness," *vijñāna*, itself implies an awareness which arises in terms of distinctions. The Sanskrit prefix "*vi-*" (cognate with the Latin prefix "dis-") lends a disjunctive sense to the verbal root "*jñā*" ("to know"),[22] meaning, roughly, "discerning cognitive awareness." This disjunctive sense is highlighted in the classical definition of *vijñāna* as "perception of distinct [objects]."[23] Cognitive or perceptual awareness (*vijñāna*) in Indian Buddhist thought is thus temporally as well as contextually disjunctive, much as our cognitive scientists described it earlier.

The entire perceptual process, though, also includes categorical and constructive aspects.

In most Buddhist analyses, discerning cognitive awareness (*vijñāna*) is nearly always accompanied by apperception (S. *saṃjñā*; P. *saññā*), a re-cognition or "knowing together" (*saṃ-jñā*; the Sanskrit prefix "*saṃ*" is cognate with Latin "con"), that brings together present sensation with previous knowledge or experience. It is defined, from the early systematic texts of Abhidharma on,[24] as the apprehension of a distinctive quality or characteristic mark (usually *nimitta*),[25] and is typically illustrated, interestingly enough, in terms of color categories: "it apperceives blue, it apperceives yellow, it apperceives red, and it apperceives white" (M I 293). But what makes these categories distinctive? They are derived, according to one text of the 5-6th century Yogācāra school, the *Triṃśika-bhāṣyam*, by exactly the same contrastive processes our cognitive scientists have described:

> Apperception means apprehending the distinguishing mark (*nimitta*) of an object... The distinguishing mark is its distinction, the cause of deciding [if it is] a blue or yellow, etc., object. Apprehending [the mark] here means ascertaining "this is blue, it is not yellow."[26]

Since most Indian Buddhist schools consider apperception to invariably occur in every mundane moment of mind,[27] each perceptual event it thought to include both the differentiating process of discerning cognitive awareness (*vijñāna*) as well as the contrastively constructive process of apperception (*saṃjñā*). As Sariputta, one of the chief disciple of the Buddha, declares in an early *sutta*:

> Feeling, apperception, and cognitive awareness, friend—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 293).

In short, both the cognitive scientists we have cited and the Indian Buddhists we have examined concur that disjunctive (*vijñāna*) as well as synthetic (*saṃjñā*) cognitive processes occur in nearly every perceptual event, corroborating psychiatrist Oliver Sacks' recent observation that "whether it is color or motion, a double process of breaking down and building up, or decomposition and recomposition—whatever one likes to call it—seems to be unavoidable."[28]

Couched in terms of our central themes, if cognitive awareness is indeed "a function of the world and our biology interacting," then its arising is clearly a function of the responsive structure of our sense faculties, our "biology," together with the correlative stimuli, the "world," which impinges upon them. These are not two essentially independent entities that just happen to come together, they are *two aspects of a single, integral event*.[29] Awareness of the world necessarily arises *in the very forms*—the distinctions and categories—determined by the structures and functions of the neural processes that subserve it. There is, ordinarily, no other way that perceptions *could* appear. The categories that are the "stuff of experience" are the same categories that are the "stuff" of the world. It is our subsequent analysis that bifurcates them.

This, however, carries further, potentially unnerving implications. As we have seen from both the cognitive scientists and the Buddhists, the categories and distinctions that constitute cognitive awareness are not isolated objects. They do not denote independent, objective characteristics, but rather reflect contextually distinctive differences. Such differences, though, are relational, not substantive. And "difference," Bateson cautions, "*being of the nature of relationship, is not located in time or in space*" (1979, 109; emphasis added). Our awareness of the "world" rests upon slippery ground indeed.

Worlds

These considerations radically challenge our ordinary notion of the "world," making it a phenomenon that must be understood interactionally rather than a reality that exists unilaterally. And if the way our "world" appears is a function of the structure of the sense faculties, then this apparent "world" is therefore also a function of the categories that constitute sensory awareness.[30] This perspective involves the same kind of inversion we saw between subject and object above: it is not the "world" that determines the perceptions of an organism, but rather the perceptual capacities of the organism that determine its "world,"[31] its environment.

This is so in several senses. First, an "environment," as geneticist Richard Lewontin (2000, 48) points out, "is something that surrounds or encircles, but for there to be a surrounding there must be something at the center to be surrounded." In this sense, a "world" is always a world *for* someone. This seemingly simple point entails several interesting implications. Lewontin continues: "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" (*ibid.*). An environment is thus defined by the organism, by the range of conditions any given organism can effectively interact with; if something cannot possibly affect that organism, it is not part of its "world." Biological philosophers Maturana and Varela therefore conclude that "the domain... of interactions into which an organism can enter *constitutes its entire cognitive reality*" (1980, 10). An organism's "world" is thus not a simple reflection of some external, pre-existing objective reality. Rather, its cognitive reality—its "cognitive domain" as they call it—is defined by the range of its possible interactions, which in turn is determined by the organism's sense faculties, or more precisely, by *the implicit categorizations built into the responsive structures* of those faculties. Our "worlds" are correlative in that same ways that our objects are; here too "world and perceiver specify each other" (Varela, et. al., 1991, 172).[32]

But there is a deeper, even more historical way in which world and perceiver "specify each other." The cognitive capacities of organisms have only come into being through recurrent interactions with their relevant environments over the extended course of evolution, resulting in what biologists Tooby and Cosmides (1992, 72) call "the evolution of a mesh between the principles of the mind and the regularities of the world." In this perspective, a species never evolves all by itself, but only in tandem with its environment; that is, they co-evolve. Tooby and

Cosmides thus conclude that it is "the environment as interacted with by the organism that, in a meaningful sense, can be said to be the product of evolution" (1992, 84). Maturana and Varela similarly suggest that "what evolves is always a *unit of interactions*" (1980, 12; emphasis added), neither a kind of organism by itself, and certainly not an environment alone, but always an organism-in-environment.

The "arising of the world" thus has two dimensions, one more or less synchronic, the other diachronic, both of which follow the same general pattern of arising.[33] The concomitance of subject and object gives rise, from moment to moment, to forms of cognitive awareness that are strongly determined by the specific structures of an organism's faculties—and this constitutes the arising of that organism's "world," its current cognitive domain. Similarly, the recurrent patterns of interaction between a species and its relevant environment give rise, over the long-run, to species-specific forms of cognitive awareness that are strongly determined by the evolved structure of that species' faculties—and this constitutes the evolution, the long-term arising, of that species' "world," its species-specific cognitive domain.[34] We will discuss the relationship between these two shortly.

Once again, we find that Indian Buddhists conceived of the "world" and its "arising" in surprisingly similar ways, both synchronically at the cognitive level, as well as diachronically at the trans-generational level.[35] In early Buddhist texts one's experience of the "world" (*loka*) was effectively equated with the arising of cognitive awareness.[36] Much like our biologists, the Buddha defined our "world" in terms of the cognitive capacities of our sense faculties (plus mind):

> The eye... The ear... The nose... The tongue... The body... The mind is that in the world by which one is a perceiver of the world, a conceiver of the world. That in the world by which one is a perceiver of the world, a conceiver of the world—this is called the world in the Noble One's terms (S IV 95).[37]

"World" here conveys much the same sense as cognitive domain: it is co-terminus with the effective cognitive range of a sentient being. A "world" is thus also thought to arise, cease or be transformed in relation with the arising, cessation or transformation of one's cognitive faculties: "it is in this fathom-long body with its perceptions and thoughts that there is the world, the origin of the world, the cessation of the world, and the path leading to the cessation of the world," that is, the four Noble Truths (*cattāri ariyaccāni* A II 48; S I 62).

A "world" then is not something static or limited by the current configuration of our cognitive faculties. Like cognitive domains, "worlds" also come into being diachronically over successive generations, or many lifetimes as the Buddhists put it. And this process occurs through the same dynamic interactions that give rise to the "world" synchronically, as depicted in the following formulation of dependent arising:

> 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)

For both the cognitive scientists and the Indian Buddhists we have cited these are parallel processes: the patterns of interaction that constitute the "arising of the world" in momentary, cognitive terms are the same patterns of interaction that constitute the "arising of the world" in longer, evolutionary terms.

But these processes are dynamic in another, more constructive sense as well. Cognitive awareness is not just a "function of the world and our biology interacting;" "the world and biology interacting" is also a function of the arising of cognitive awareness in ways that are all too easily overlooked. For there is a reciprocal *causal* relation between them such that cognitive awareness, though itself a result of these interactive processes, circles back to influence those very processes in its own right. And this is true for scientific as well as Buddhist thought.

Feedback

Cognitive awareness, and by extension the embodied distinctions and implicit categorizations that constitute its moment-to-moment arising, is not merely epiphenomenal. The conditions that give rise to cognitive awareness also exert a crucial though indirect *causal* influence in the evolution of a species' cognitive domain by means of the behavior that awareness elicits, behavior that in turn influences the gradual evolution of that species' cognitive domain. This is not always obvious. In our perennial enchantment with unilateral determinants, such as genes, we easily underestimate the role that behavior plays in the evolution of life in general and of cognitive faculties in particular. Nevertheless, the influence of behavior—of actions and the cognitive processes that elicit and enable them—is absolutely central to the theory of evolution.[38]

According to evolutionary theory species evolve through differential reproductive success, the fact that certain organisms reproduce more than their conspecifics. This creates "a circle of positive feedback" (Carrithers 1992, 49)[39] whereby the conditions that contribute to this relative success—that organism's actions as well as the physiological and psychological structures that facilitate them—are reinforced and gradually developed over successive generations. In this way, each species' specific cognitive domain, its effective "world," gradually evolves in conjunction with its particular environment. The physiological and behavioral traits developed through this process are thus neither a simple reflection of some objective world, since they also reflect the effects of that species' behavioral patterns, nor are they the product of genes alone, since genes themselves only evolve in relation to particular environments.[40] Rather, these traits reflect the accumulative results of reproductively successful interactions between a species' ancestors and their natural and social environments over the long-term.

This is true for our human minds and bodies as well. Chief amongst these traits are the physical, cognitive and emotional capacities necessary for finding food and shelter, and for

producing and protecting progeny. In other words, the drive to preserve one's personal existence, the desire for the activities that lead to reproduction, and sufficient craving for and defense of the means to achieve both these ends, have long been indispensable for producing, preserving, and re-producing human life. That these aims—for self-protection and sex, through attachment and aggression—were instrumental in the evolution of, and are therefore powerfully present within, the forms of existence we embody right here and now directly follows from the basic postulate of evolutionary theory: what has been more reproductive in the past is more plentiful in the present. Such is the "arising of our world."

Indian Buddhists also thought that behavior—actions and their motivations—plays an important causal role in the evolution of living forms. In the words of one *sutra*, "the causes of living structures (*saṃskārā*) in the future are action, craving and ignorance."[41] More specifically, as the great fifth-century Buddhist philosopher, Vasubandhu, states: "it was said that the world (*loka*) in its variety arises from action (*karma*). [The effects of these] actions accumulate due to the power of the afflictive dispositions (*anuśaya*)" (AKBh *ad* V 1).[42] The "world" arises here from actions (*karma*) that are motivated by the "afflictive dispositions"—craving, attachment and aggression, and, underlying them all, a misguided view of our own existence (*satkāyadṛṣṭi*)[43]—the same sorts of behavior, with similar motivations, that evolutionary theory posits as instrumental in the evolutionary "arising of the world."

In Buddhist thought, too, this results in a "circle of positive feedback" wherein these afflictive dispositions are gradually reinforced by the very actions they instigate, and which together perpetuate the "arising of the world." The cyclic nature of these processes is reflected in the general Indian term for mundane existence, saṃsāra, literally "the going around," as well as in the extended formula of dependent arising itself, classically depicted in the famed Wheel of Life (*bhava-cakra*) murals found throughout Buddhist Asia. As Vasubandhu avers in the *Abhidharma-kośa*: "The mental stream," a euphemism for evolving individuals, "increases gradually by the afflictions and by actions, and goes again to the next world. In this way, the circle of existence is without beginning."[44] That these drives—these cravings, attachments and aggressions—were instrumental in the past arising of, and also therefore powerfully present within, our current forms of embodied existence, similarly follows from the basic postulate of the Buddhist world view. Thus, Vasubandhu continues from the passage cited earlier:

> ....without the afflictive dispositions [actions] are not capable of giving rise to a new existence. Thus, the afflictive dispositions should be known as the root of existence (*mūlaṃ bhava*). (AKBh ad V 1a).[45]

For both Indian Buddhists and evolutionary biologists, it is behavior—the sum total of one's actions and their aims—that brings about the "arising of the world" through patterns of cyclic causality, both in the cognitive short-term as well as in the evolutionary long-term. They both maintain, moreover, that what instigates and informs the potent actions that bring about these

"worlds" is precisely that which constitutes and accompanies all ordinary forms of cognitive awareness: the embodied categorizations and the dispositions they evoke, that is, forms of sensual experience, an ingrained sense of self, and our endless self-aggrandizing efforts. Therefore, insofar as they serve to instigate the actions that perpetuate cyclic existence—the actions that lead to "living structures (*saṃskārā*) in the future"—then so far do these categories and dispositions *impart causal influences on human evolution in their own right*. Simply put, there would be no human embodiment, no human "world," without the categories that have given rise to human forms of cognitive awareness and activity. The afflictive dispositions can, indeed, be considered the "roots of existence."

And what is the single most important source of human categorization and classification, whose predispositions equally pervade our physiological and psychological cognitive structures, and which gives rise to that most enduring and endearing affliction—our sense of independent, individual existence (*satkāyadṛṣṭi*)—for whose promotion and protection we commit all kinds of consequential actions, thereby affecting evolutionary processes and perpetuating the cyclic "arising of the world"? Language. The capacity to conceive of and cling to a sense of self as some "thing" separable from the larger processes in which we are inescapably enmeshed—a capacity that has literally helped make us who we are—would simply have been impossible without the advent of human linguistic communication.

Language

In current thinking, human symbolic communication, that is, language,[46] neither sprung fully formed from the head of Zeus nor was divinely bestowed on man at the beginning of time. Like the arising of awareness, language evolved, neurophysiologist Terrence Deacon (1997, 409f) observes, "neither inside nor outside brains, but at the interface where cultural evolutionary processes affect biological evolutionary processes." Language, and its influences upon human consciousness, culture and evolution, is thus also, and unavoidably, a product of "the world and our biology interacting." And, like cognitive awareness, it too reciprocally influences its own originating milieu.

First, keeping in mind the evolutionary processes outlined above, it is most probable that improvements in early man=s communicative capacities, such as proto-language, would have improved the differential reproductive success of its users. As with other traits, these incipient linguistic abilities likely entered into the evolutionary "circle of positive feedback" and become gradually reinforced over time, until they eventually transformed our entire cognitive physiology. These changes centered on our increasingly enlarged prefrontal cortex, the locus of most higher cognitive processes. Language use and this "prefrontalization" continued to reinforce each other, so that this symbolic-linguistic mode of cognition has now come to influence other, originally nonlinguistic, modes, "even when our symbolic-linguistic abilities are uninvolved" (Deacon 1997, 417).[47] We no longer see and touch a purely physical object, a ball; we now see and touch

something with a name and a function, a "ball."

Language use has thus subtly shifted our cognitive focus from the immediate world of sensory realities in front of us to the ethereal realms of symbolic imagination within and between us.[48] We are no longer naked apes living in trees on the savannah, but denizens of cognitive domains of our own devising, simultaneously empowered and impaired by the now indispensable prostheses of language and culture. As anthropologist Clifford Geertz (1973, 49) elaborates,

> 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 symbol[ic modes of communication] 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.

In this widely accepted view, language is not simply added on to other, entirely separable cognitive capacities. Language is constitutive of all distinctively human cognitive processes.[49] In this sense, as well, we have no "pure sensation."

And just as our individual cognitive domains arise from moment-to-moment informed and instigated by our embodied categorical distinctions—which must now include the phonological, morphological, syntactic and semantic distinctions comprising language—so too has our species-specific cognitive domains arisen over evolutionary time insofar as the *capacity* for such distinctions have become embodied in human physiological and psychological structures. In other words, and echoing Geertz, there would be no distinctively human embodiment without the feedback cycle of evolution having been heavily influenced by the distinctions that underlie our uniquely human, that is our essentially linguistic, cognitive domain.[50] The distinctions comprising language have thus imparted *causal influences on human evolution in their own right*.[51]

Foremost amongst these categorical distinctions has undoubtedly been the capacity to conceive of oneself as an enduring locus of experience existing relatively independently of momentary stimuli and the awareness it instigates;[52] that is, to conceive of a *truly* independent self one must ignore the mutual dependency and inseparability of subject and object.[53] And this is only conceivable[54] because language allows us to fully objectify[55] ourselves in contradistinction from others and in relation to remembered pasts and imagined futures[56]—contextual and temporal relationships, Bateson reminds us, that *belie the very autonomy they appear to affirm*.

And it is this contradiction, with all its attendant obscurations, that lies at the heart of the human predicament. Just as we cannot (ordinarily) evade the categories that "are the stuff of experience" (Lakoff and Johnson, 1999, 18f.), nor avoid the linguistification of experience even when "our symbolic-linguistic abilities are uninvolved" (Deacon, 1997, 417), so too, according to Deacon (416), we "cannot help but see the world in symbolic categorical terms, dividing it up according to opposed features and organizing our lives according to themes and narratives." Our

cognitive schemas virtually require us to see our thoroughly interdependent world "through the glass darkly" of independent entities, unchanging essences and substantive selves. "We are not just a species that uses symbols," Deacon decries, "the symbolic universe has ensnared us in an inescapable web" (436).

Indian Buddhists also expressed the intimate relationships between the cognitive processes associated with speech, the reflexivity of language, and a sense of autonomous self-existence, in terms of an ensnaring, symbolic feedback cycle centered on verbal or conceptual proliferation (P. *papañca*; S. *prapañca*). These processes revolve around the nature of mental cognitive awareness (P. *mano-viññāṇa*; S. *mano-vijñāna*), the sixth mode of cognitive awareness in standard Buddhist analyses. Like sensory cognitive awareness, mental cognitive awareness arises with the concomitance of a faculty and its correlative objects. That is, it arises in dependence upon *manas*, the faculty of mind,[57] and two distinct kinds of objects: sensory awareness and *dharma*s, phenomenon such as thoughts or ideas. The first object consists of the five forms of sensory awareness themselves. For example, when a moment of sensory awareness arises it often instigates a mental awareness *of* that sensory awareness,[58] one that is reflexively aware "*that* such and such a sensory awareness has occurred."[59] We not only see, but are aware that we see. This reflexive nature of mental awareness is only explicitly related to language, however, in regard to its second object, *dharma*s as thoughts or ideas. When mental cognitive awareness arises with these as objects, it is invariably accompanied by thought and reflection (*vitakka-vicāra*),[60] both of which are considered activities of speech (*vitakka-vicāra vacisaṅkhārā,* M I 301).[61] Thus, the reflexivity of mental cognitive awareness bridges both ordinary sensory awareness and more language- dependent cognitive processes (indeed, for some schools *vitakka-vicāra* accompanies all moments of sensory awareness[62]).

As with language itself, however, this relation tends to invite endless rounds of conceptual proliferation:[63] One early discourse reads:

> Dependent on the eye and forms, visual-cognitive awareness 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 (*vitakketi*). What one thinks about, that one conceptually proliferates (*papañceti*). With what one has conceptually proliferated *as the source* (*nidāna*), apperceptions and notions tinged by conceptual proliferation beset a man with respect to past, future, and present forms cognizable through the eye, [and so on, up to:] mind-objects cognizable through the mind. (M I 111f)[64]

Here, the arising of cognitive awareness (P. *viññāṇa*; S. *vijñāna*) and apperception (P. *saññā*; S. *saṃjñā*), which occur in nearly every cognitive process (M I 293, earlier), evoke cogitation (*vitakketi*, the verbal form of *vitakka*)and conceptual proliferation (*papañca*). And this conceptual proliferation in turn serves "as the source" (or cause, *nidāna*) for further apperceptions and notions regarding other objects of cognitive awareness, and so on.

Language then—with its endlessly proliferating concepts and classifications—not only attends most cognitive processes, but also gives rise to its own a runaway recursivity. In fact,

conceptual proliferation is so bound up with the basic components of perception—with contact,[65] apperception and thought[66]—that it serves as a synonym for cyclic existence as a whole.[67]

And here, too, the most deeply entrenched of these recursive possibilities is a view of one's own self-existence (P. *sakkāyadiṭṭi*; S. *satkāyadṛṣṭi*), the view that we are or have an underlying entity or enduring self (*attā*; S. *ātman*). As one early text declares, the thought " 'I am' is a proliferation; 'I am this' is a proliferation; 'I shall be' is a proliferation" (S IV 202f). Indeed, the early Pāli text, the *Sutta-nipāta* (Sn. 915-16), calls the thought "I am" the root (*mūla*) of proliferation itself. In fact, the underlying disposition towards this notion "I am" (*asmīti-anusaya*) is so deeply entrenched in our psyches that it is considered the last "fetter" to be removed on the path to liberation:

> So, too, friends, even though a noble disciple (*ariya-sāvaka*) has abandoned the five lower fetters, still, in relation to the five aggregates subject to clinging, there lingers in him a residual conceit "I am," a desire "I am," an underlying disposition "I am" that has not yet been uprooted (S III 131).

It appears we are ensnared in a web of circles within circles. We seem bound to a notion of enduring, autonomous selfhood which only arises within a reflexively proliferating symbolic system that disjunctively distinguishes it from others, and that is itself based upon a reflexive cognitive system which only arises in regard to temporal, contextual and categorical distinctions. Our vaunted "in"-dependence depends upon distinctions based upon distinctions. But distinctions, we recall, are relational not substantive, fleeting not enduring; in Bateson's words, they are "not located in time or in space." No wonder Deacon (1997, 452) wryly remarks that:

> It is a final irony 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.

Unconscious Processes

The fact that *both* our sense of self as well as our distinctively human cognitive domains arise in dependence upon linguistic communication entails two more far-reaching consequences: that much of what influences the "arising of our selves and our world" occurs unconsciously, yet at the same time operates intersubjectively. Both of these insights are shared by some cognitive scientists and some Indian Buddhists.

The obvious place to start talking about language is that, legends aside, we do not start off talking. Language is only gradually acquired during the first few years of life through sustained interaction with our immediate caretakers, a cognitive development that irrevocably distinguishes us from our nonlinguistic primate cousins. In the words of Michael Tomasello (1999, 123), who

studies both primate cognition and human language acquisition, "the process of acquiring and using linguistic symbols fundamentally transforms the nature of human cognitive representation." By having acquired language, "the language user partitions her world into discrete units of particular kinds" (150), i.e. into "the categories and perspectives and relational analogies embodied in that language" (189). This includes such simple "units" as nouns, verbs and adjectives, as well as the causal and relational assumptions implicit in all complex syntactic structures and, indeed, the very possibility of taking multiple perspectives. *This* is our distinctively human cognitive domain.

These categories and perspectives, however, usually operate indiscernibly and involuntarily. Through years of acquisition and use, the "categories and relations embodied in one's language" have become embedded in specific neurological pathways and structures within each person's cognitive system, which then continuously serve as the unseen yet indispensable basis for all symbolic-linguistic processing, enabling us to comprehend most language most of the time without consciously contrasting phonemes or parsing pronouns. Thus, Lakoff and Johnson (1999, 18) conclude that these and other forms of "categorization [are], for the most part, not a product of conscious reasoning.... We do not, and cannot, have full conscious control over how we categorize."

One of the most entrenched of these implicit categorizations, as we have seen, is our view of ourselves as separable entities. This, too, operates mostly unconsciously and largely involuntarily. "We all grow up," according to Lakoff and Johnson (1999, 268), "with a view of our inner lives that is mostly unconscious, [and] used every day of our lives in our self-understanding." But this view of self, they continue, is "both internally inconsistent and incompatible with what we have learned from the scientific study of the mind" (*ibid*.)—not least because its reliance upon linguistic distinctions belies its basic conceit of separate existence. Linguistic reference, after all, not only functions disjunctively, by distinguishing "self" from "other"[68] and "subject" from "object," but also only operates intersubjectively, relying upon the understanding of other speakers—without whom there would of course be no language in the first place.[69] In short, both the "arising of our human world" and our sense of ourselves as truly autonomous selves depend upon the implicit, and hence effectively unconscious, linguistic categorizations and classifications that underlie our moment-to-moment cognitive processes, which themselves depend upon the community of speakers with whom we have learned to share such concepts, contrasts and syntactic constructions.[70]

The arising of our distinctively human "world" then is based not only upon long-term influences that we cannot fully discern, that is, the physiologically-based linguistic structures that have evolved through extended organism-environment interaction, but also upon more recently acquired influences that also operate unconsciously, that is, the neurologically-based linguistic structures developed through extended social interaction. And all these influences underlie and inform every moment of waking awareness.[71] Our world arises of its own accord, in all its apparent objectivity.

Here, too, Buddhists in classical India arrived at remarkably similar conclusions. Building upon the Buddha's analyses of the dependent arising of cognitive awareness (*vijñāna*) in the 5th century BCE, such as we have examined earlier, Buddhist thinkers of the Yogācāra school in the 4-5th century CE conceived of the dependent arising of *unconscious* cognitive awareness, namely an *ālaya-vijñāna* or "store-house" consciousness. As formulated in the classical treatises of the brothers, Asanga and Vasubandhu, this "*ālaya*"—"home, base, or store"—awareness operates in ways remarkably similar to the unconscious processes described earlier: supported by physiological and linguistic structures that have been built up through the constructive, cyclic processes of organism-environment interaction (that is, *saṃsāra*), this subtle level of awareness simultaneously supports and informs all moments of conscious awareness, is closely associated with unconscious conceptions of self, and, perhaps most intriguingly, also encompasses an intersubjective, endlessly proliferating, yet still subliminal dimension of the arising of our common, collective "world."

These characteristics are most succinctly articulated in several early Yogācāra texts: the *Saṃdhinirmocana Sūtra*, a 2nd-3rd century CE *sūtra* attributed by Mahayana Buddhists to the Buddha himself, the *Yogācāra-bhūmi*, an encyclopedic text attributed to Asanga but likely compiled between the 3rd and 5th centuries CE, and Asanga's own *Mahāyāna-saṃgraha*. *Saṃdhinirmocana Sūtra* V.2 first outlines the complex conditions that support the arising of this form of underlying, subliminal awareness:

> In cyclic existence with its six destinies such and such beings are born as such and such a type of being. They come into existence (*abhinirvṛtti*) and arise (*utpadyante*) in the womb of beings.... There, at first, the mind with all the seeds (*sarvabījakaṃ cittam*, a synonym of *ālaya-vijñāna*) matures, congeals, grows, develops, and increases[72] based upon the two-fold substratum (or "appropriation,"[73] *upādāna*), that is,
>
> (1) the substratum of the material sense-faculties along with their supports (*sādhiṣṭhāna-rūpīndriya-upādāna*),
>
> (2) and the substratum which consists of the predispositions toward conceptual proliferation in terms of conventional usage of images, names, and conceptualizations (*nimitta-nāma-vikalpa- vyavahāra-prapañca-vāsanā-upādāna*).[74]

This dense passage summarizes much of what we have seen earlier. Forms of unconscious mental processes not only evolve through long-terms patterns of cyclic causality operating over multiple generations, but they also arise and develop from moment-to-moment in dependence upon several supporting conditions: the traditional condition of the sense-faculties, along with their embodied cognitive schemas, as well as a condition newly articulated by this school, the predispositions or impressions (*vāsanā*) of the names and concepts of ordinary language, along with its propensity toward conceptual proliferation (*prapañca*).

This *ālaya* awareness also arises in conjunction with the second traditional condition for the arising of cognitive awareness: a correlative cognitive object. The *Yogācāra-bhūmi* describes this as the "outward perception of the surrounding world, whose features are undiscerned

(*bahirdhā-aparicchinnākāra-bhājana-vijñapti*)," a perception which arises based upon the first two conditions, now called "inner appropriation."[75] In other words, this form of "subtle" (*sūkṣma*) cognitive awareness continuously arises based, on the one hand, on the living sense-faculties and the predispositions or impressions instilled by past linguistic experience, conceptualization, naming, etc., in conjunction with, on the other hand, an "undelineated surrounding world," a cognitive domain whose features remain obscure.[76]

This subliminal mode of cognitive awareness does not usually occur alone, however, for it also simultaneously supports all *supra*liminal mental processes. In the Yogācāra view, the six traditional modes of cognitive awareness (five sensory, one mental) no longer arise solely in dependence upon their own respective faculties and correlative objects, as in most Buddhist analyses, for they also arise supported by this *ālaya* awareness.[77] Sensory cognitive awareness in this model is therefore never *simply* sensory. As in Deacon's and Lakoff and Johnson's analyses, sensory awareness is also indelibly influenced by the linguistic predispositions—the classifications, conceptualizations, etc.—that accompany the arising of subliminal awareness.

As our earlier analyses would also suggest, however, if linguistic categories and concepts underlie (nearly) all modes of awareness, subliminal as well as supraliminal, then we are predisposed (*vāsanā*) to the same conceptual prolixity (*prapañca*), the same ensnaring recursivity that language invites at unconscious levels as well. Accordingly, our sense of self, the view of self-existence (*satkāyadṛṣṭi*) which arises out of the reflexivity of linguistic and symbolic representation, is now also thought to occur automatically and unconsciously in nearly every moment of mind[78]—and with the same ensnaring consequences. The *Yogācāra-bhūmi* thus warns that as long as one "is not freed from the bondage of perception in regard to distinguishing marks (*nimitta*)"[79]—that is, as long as one remains constrained by the unconscious schemas underlying ordinary perception—then so long will *all* our forms of cognitive awareness be indelibly informed by the distinction between "self" and "other"[80] and thereby subtly motivated by the underlying disposition toward the sense "I am." And insofar as this conduces towards karmically consequential actions, so far does this entrenched self-view keep us caught in cyclic existence, endlessly spinning further webs of ensnaring signification. The view "I am," we recall, was called the root (*mūla*) of proliferation (*papañca*; Sn. 915-16), and the afflictive dispositions the root of existence (*mūlaṃ bhava*; AKBh ad V 1a). In this way, the underlying disposition toward the sense "I am," "that is mostly unconscious, [and] used every day of our lives in our self-understanding" (Lakoff and Johnson, 1999, 268), is seen to have *compelling causal efficacy in its own right*.

Intersubjectivity

At this point, our search for the conditions underlying and informing the "arising of the world" has opened up well beyond the range of each individuals' cognitive processes. If language use, together with the symbolic selves it enables and the afflictive actions it in turn instigates, is constitutive of our distinctively human world in the way that Indian Buddhists and our cognitive

scientists suggest, then the conditions for the arising of our world are much broader than most of us can readily comprehend. For "symbolic reference," Deacon (1997, 452) submits, "is at once a function of the whole web of referential relationships and of the whole network of users extended in space and time." But where in the world do these distinctively human modes of cognitive awareness arise if they arise in conjunction with "the whole web of referential relationships" and "the whole network of users"? Here, too, we find some scientists and some Buddhist thinkers responding similarly to these curious questions.

We have interpreted the notion of "world" (*loka*) as a "cognitive domain," the possible range of experience of any given organism or species that has come about through recurrent interaction between that species and its broader natural and social environments. In this sense, our distinctively human world, the cognitive domain brought about through language, is inescapably intersubjective, and therefore both richly interconnected and radically decentered at the same time. We live in a "shared virtual world," Deacon declares, precisely because "the evolution of symbolic communication... created a mode of extrabiological inheritance... [that] is intrinsically social," one that evolved, we remember, "neither inside nor outside brains" (Deacon, 1997, 409f). And it is language that is the diffusing yet unifying medium of this common cognitive domain, that bridges not only percept and concept,[81] nature and culture, but also self and society—the last of the three interdependencies mentioned at the onset of this paper.

Indian Buddhists also interpreted the "arising of the world" in terms of intersubjective experience facilitated by language. They distinguished between the *sattva-loka*, the world of sentient beings, which beings experience individually by virtue of their biological particularity, and the *bhājana-loka*, the "receptacle" or surrounding world, which classes of beings experience similarly by virtue of their cognitive commonality.[82] In Indian Buddhist traditions, as we have seen, both these "worlds" result from the accumulated actions (*karma*) of sentient beings. For some schools, such as the Yogācāra, the world of individual beings (*sattva-loka*) results from actions committed by individuals, while the shared, surrounding world (*bhājana-loka*) results from actions beings commit in common.[83] Until such actions ripen into their respective "fruits," the potential to experience these results are metaphorically symbolized as "seeds" stored within the "store-house" consciousness (*ālaya-vijñāna*). Asanga's *Mahāyāna-saṃgraha*, therefore, correlates these two kinds of seeds—the potential for experiencing either a shared "world" or an individual "world"—with two distinct aspects of subliminal awareness, which he accordingly call the common (*sādhāraṇa*) and uncommon (a*sādhāraṇa*) aspects of *ālaya-vijñāna*, respectively.[84] We could not experience our common, surrounding world, one of the commentaries explains, if we did not have such "seeds" in common, that is, if we did not have similar potentialities to experience such similar "worlds."[85] In other words, we would not have a similar "environment," a similar cognitive domain, which affords a similar range of experiences if we did not have fundamentally similar influences operating at subliminal levels of our awareness.

But if each individual's "world" is largely determined by its own previous actions, its own previous karma, then why would our "worlds" have anything in common at all? The traditional

answer is that each individual's previous actions were similar enough to have resulted in sense faculties that are similar enough to afford a similar range of experience, i.e. a common cognitive domain. The second commentary to the *Mahāyāna-saṃgraha* (*ad* I.60), states this quite explicitly:

> [The statement] "the common [aspect of *ālaya* awareness] is the seed of the share world" means that it is the cause (*kāraṇa-hetu*) of perceptions (*vijñapti*) which appear as the shared 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*.[86]

In other words, the similar actions of individual beings results in the capacities to perceive the world similarly. And what makes these actions similar? Actions that are informed by similar conditions and instigated by similar intentions give rise, over the long term and in the aggregate, to similar results, including the capacities to experience a similar "world." And why might these conditions and intentions be similar?

It is language use, via the shared aspect of *ālaya* awareness, that provides the similar conditions that give rise to our shared world, our common cognitive domain. According to both commentaries on the *Mahāyāna-saṃgraha*, our underlying cognitive processes (*ālaya-vijñāna*) are imbued with the impressions or predispositions of language (*abhilāpa-vāsanā*) on the basis of which manifest cognitive awareness (*vijñāna*) arises in regard to expressions of selves (*ātman*) and phenomena (*dharma*), etc., *due to the special power* (*śakti-viśeṣa*) of the impressions of conventional expressions (*vyavahāra*).[87] That is to say, that the shared conventions of language (*vyavahāra*), which delineate the world into discrete objects and categories, as Tomasello so well described earlier (1999, 123), similarly yet unconsciously shape the way our conscious awareness of the world arises. And, to the extent that our "world" is similarly construed, it conduces to similar actions, similar karma, which in turn result in similar "worlds." As the *Mahāyāna-saṃgraha* (*ad* I.60) states, the shared aspects of subliminal awareness (*ālaya-vijñāna*) give rise to similar perceptions of our "world" in accordance with our own similar karma.

Language use thus constructs our common "world" insofar as it is instrumental both in the long-term evolution of specifically human cognitive domains, as well in the moment-to-moment arising of common forms of cognitive awareness in general and of our symbolic selves in particular—the latter of which, we have seen, is thought to accompany each and every moment of mundane consciousness. But if this commonality of cognitive awareness depends upon our common linguistic structures, where or how then, finally, does such awareness arise? Where indeed does language reside? This line of inquiry leads Deacon (1997, 452f) to vertiginously aver that, in the end,

> 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.

Not only does symbolic awareness depend upon language, but the most crucial condition for its

arising seems to be diffused throughout "the whole network of users extended in space and time."

From the Buddhist point of view, though, this is hardly some big happy love-fest. Since our intersubjective symbolic selves depend upon language, they are susceptible to the same runaway recursivity, the same profuse prolixity (*prapañca*) that all language is. The impressions of speech, which have the "special power" to give rise to cognitive awareness in regard to expressions of selves, *dharma*s, etc. are never fully "used up" (*anupabhukta*), *Mahāyāna-saṃgraha* I.61.2 declares, precisely because "*the seeds of the impressions of language give rise to conceptual proliferation since beginningless time*," without which, it warns, "the new arising of the impressions of language would be impossible."

In other words, linguistic recursivity is the generative matrix from which springs forth profusions of possible worlds, further enfeebling any sense of a singular, external reality we might unambiguously apprehend, on the one hand, while continuously ensnaring us in its endlessly proliferating symbolic webs, on the other. As Tomasello (1999, 107) observes, not only does "the perspectival nature of linguistic symbols multipl[y] indefinitely...," but "the intersubjective and perspectival nature of linguistic symbols actually undermines the whole concept of a [single] perceptual situation by layering on top of it the multitudinous perspectives that are communicatively possible for those of us who share the symbol" (*ibid*., 132). That is, thanks to language use, our linguistified symbolic awareness is both everywhere and nowhere at the same time.

This recursive discursiveness that language evokes operates on a number of levels: not only synchronically, between subliminal and supraliminal forms of cognitive awareness, but also diachronically, between our previous linguistic experience and our present proclivities, conditioned as they are by impressions of language. These two operate both within a single lifetime, and, in Buddhist or biological terms, over multiple lifetimes or countless generations. What the *Mahāyāna-saṃgraha* is now proposing, consonant with Deacon and Tomasello, is a third, largely unconscious yet thoroughly *intersubjective* feedback system, which, like the first two dimensions of cyclic causality, continuously proliferates and perpetuates individual cyclic existence, but which also, unlike them, connects us all through our common experiences of a shared, surrounding "world." And it is this, Deacon declaims (1997, 427), that "gives us the ability to share a virtual common mind," one that effectively encompasses "the whole network of users extended in space and time." Ironically yet undeniably, this points to a path beyond the bonds of an alienated individuality supposedly separable from the surrounding world, and suggests the possibility of much more encompassing conditions for the arising of cognitive awareness. We may perhaps more fully appreciate the apophasism of Vimalakīrti's epigraph, which declares that "mind is neither within nor without, nor is it to be apprehended between the two." It is, like all interactive phenomena, "like a dream, a phantom, a drop of dew, a flash of lightening."

It is said that when one sees through the false duality of subject and object, when one sees

their inseparability, their "emptiness" in Yogācāra terms, then the veils obscuring our interdependent world are removed and one sees things, as the Buddhists say, "as they are" (*yātham bhūtam*). This insight is said to liberate from unfounded fears, insatiable desires and the mistaken views they depend upon. This is true, presumably, however those veils may be removed.

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1. "What is objective acquires its objective status only in relation to what is subjective" (Skarda 1999, 90).

2. We will only be citing here Indian Buddhist traditions up to the Yogācāra school, *c*. 4-5th centuries, CE. All general statements about "Buddhism" are to be qualified accordingly.

3. As physicist Norbert Wiener (1950, 96) observes, "We are not stuff that abides, but patterns that perpetuate themselves."

4. This view is no less metaphysical for being so firmly entrenched in science and "common sense." As Stern (1995, 79f) observes: "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."

5. "The sciences, while developing their own modified or novel meanings of definition, have abandoned the concept of *essence*... Science is not interested in essences. A modern physicist cannot define matter; but he can handle it, and can do so because his predecessors eventually learned that the essence does not signify. He understands the behavior of matter not because he knows what matter is—for he does not; but because he has learned how it operates, and how it changes" (Smith 1962, 143).

6. Simply put, something that never changes cannot be the specific cause of a particular change. How, for example, could an unmoving billiard ball ever cause another ball to move? Unchanging essences therefore can have no causal role in the arising of things.

7. We are well aware of the irony of speaking of "self" in a Buddhist context, and do so in concession to popular usage (*vyavahāra*). As should be completely clear in what follows, it carries no substantive implications.

8. Our rhetorical strategy is similar to that expressed by Eleanor Rosch in her recent article, "Reclaiming Concepts" (1999, 71, n. 1): "Note that I am starting with *mind* and *world* as those terms are generally used and attempting to guide the reader towards a different (arguably better) understanding of such matters."

9. We are drawing upon, among others, Freeman (2000), Skarda (1999), and Varela, *et. al.* (1991).

10. It is only "when mind and world are considered separate," Eleanor Rosch (1999, 74) observes, that "causal or explanatory efficacy is attributed either to the mind or the world."

11. This marks another of the parameters of our paper. In what follows, we will only be discussing Buddhist analyses of mundane mental processes. Although Buddhist traditions hold that certain states of mind ultimately transcend worldly consciousness, these are not sufficiently commensurate with scientific perspectives for us to make useful comparisons at this time.

12. This is explicitly expressed by Vasubandhu (Pruden 1990, 118), in his fifth-century classic, the *Abhidharma-kośa*: "The sutra 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."

13. Reflecting Buddhist usage, we take "faculty" (*indriya*, literally "governing," "power") as inclusive of both the specific sense organs, such an eye or ear, as well as the neurological processes connected with that specific sensorium (which Buddhist analyses generally do not further specify).

14. M I 190: "When internally the eye is intact and external forms come into its range and there is the corresponding engagement, then there is the manifestation of the corresponding class of consciousness" (Ñāṇamoli 1995: 284).

15. It is important to distinguish between color as a perceptual experience, and the physical nature of light. As Skarda (1999, 82) remarks, "with respect to perceptual system functioning, 'physical reality' refers to things like light or sound waves and neural activity, while 'perceptual reality' refers to the product of perceptual functioning, i.e. the percept... [L]ight and its physical properties are not colours."

16. "Consciousness... should not be identified with the subjective sphere, as idealism claims, or with the objective sphere as materialism and scientific realism claim" (Skarda 1999, 91).

17. We say "appears to invert" because a rejection of naive realism does not in itself entail an affirmation of idealism. As Skarda (1999, 80) cautions, while "all *perceived* features and objects are the *products* not the causes of perceptual processing... rejection of naive realism does not imply.... a form of subjectivism, for it does not claim that the percept is merely subjective. Subjectivism [also] violates the principle.... that all phenomena (whether physical or mental) are inexorably embedded in a causal network of reality. The notion of a cut off or private (acausal) interiority is essentially meaningless."

18. Freeman (2000, 65-90).

19. Concise Oxford English Dictionary (Oxford, 1976, 1130) defines stimulus as "a thing that evokes a specific functional reaction in an organ or tissue."

20. "This cannot happen in the receptor layer," Freeman (1999, 81) explains, "because those neurons do not interact."

21. Skarda (1999, 87): "the discreteness of components of the phenomenal event created by sense organs... is not copied from that event, it is bestowed on it by virtue of the isolated way in which it is used by receptor neurons." Also see note 17, earlier.

22. Thus the standard translation of the Sanskrit prefix "*vi*-" into Tibetan is "*rnam*," "different, distinct, individual" (Das: 757) and into Hsüan Tsang's Chinese is "*fen*," "to divide, share,

separate, distinguish" (Mathew's CED, 269, #1851).

23. *Vijñāna prativijñapti* (*Abhidharma-kośa.* I.16. Poussin. 1.30). The *Yogācāra-bhūmi* (Tib.189b4f) 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 in the early texts is "[one] cognizes, therefore it is called cognitive awareness" (M I 292. *vijānati ti kho tasmā viññāṇa ti vuccati*). *Milinda's Questions* (1963-64, 85) defines *vijñāna* similarly: "whatever material shape (*rupa*) a man sees he discriminates it by consciousness, and whatever sound he hears, whatever smell he smells, whatever tastes he savours, whatever touch he feels, and whatever mental state he discriminates, he discriminates it by consciousness. Even so, sire, is discriminating the distinguishing mark of consciousness."

24. For example, the *Dhammasangaṇi* (7f.): "What on that occasion is apperception (saññā)? The apperception, the apperceiving, the state of having apperceived which on that occasion is born of contact with the appropriate element of mental cognitive awareness [*mano-viññāṇa*]–this is the apperception that there then is." (*Katamā tasmiṃ samaye saññā hoti? Ya tasmiṃ samaye tajjāmanoviññāṇadhātusamphassajā saññā sañjānanā sañjānitattaṃ ayaṃ tasmiṃ samaye saññā hoti*; translation altered slightly for terminological consistency).

Rhys Davids' note on this is also relevant: "Here, if we follow the C[ommentar]y. (Asl. 110), saññā means simply that sense-perception which discerns, recognises and gives class-reference to (upaṭṭhita-visaya), the impressions of sense.... The essence of saññā is said to be recognition by way of a mark" (*ibid*., 7f).

25. *Milinda's Questions* (1963-64, 84): "Reverend Nagasena, what is the distinguishing mark of apperception?" "Apperceiving, sire, is the distinguishing mark of apperception. What does one apperceive? One apperceives dark green and one apperceives yellow and one apperceives red and one apperceives white and one apperceives crimson" (terminology altered slightly for consistency).

26. *Saṃjñā viṣaya-nimitto udgrahaṇaṃ. viṣaya ālambanaṃ. Nimittaṃ tad viśeṣa nīlapī tādyālambana vyavasthākāraṇam. tasyo udgrahaṇaṃ nirūpaṇaṃ nīlam etan na pītam iti*. (*Triṃśika-bhāṣyam*, 1925, 21). Tib.: '*du shes ni yul la mtshan mar 'dzin pa 'o / yul ni dmigs pa 'o / mtshan ma ni de'i bye brag / sngon pa dang / ser po la sogs pa dmigs pa rnam par bzhag pa'i rgyu 'o / de la 'dzin pa ni 'di sngon po nyid yin gyi ser po ni ma yin no zhes rtog pa 'o*.

27. While the Yogācārins, for example, held that there are five omnipresent factors associated with every moment of mind (*citta-saṃprayukta-sarvatraga*): attention, sense-impression, feeling, apperception, and intention (*manaskāra, sparśa, vedanā, saṃjñā, cetanā*), the Theravādins reckoned there were two additional ones (individuality of object (*ekaggatā*) and life faculty (*jīvitindriya*), while the Sarvāstivādins included an additional five—desire, discernment, discriminatory awareness, recollection or mindfulness, determination, and concentration (*chanda*, *mati*, *prajñā*, *smṛti*, *adhimokṣa*, *samādhi*)—resulting in ten processes operating in each mind-moment. (AKBh *ad* II 24-29; Shastri, 186; Poussin, 153-6,161-169; Hirakawa, *et. al.* 1973, Vol. I. xii-xxiv; *Compendium*, 94-96; Chaudhuri 1983, 105-108.)

28. "Letter to Editor." *New York Review of Books*, April 8, 2004, 85.

29. Rosch (1999, 72): "The subjective and objective aspects of concepts and categories arise together as different poles of the same act of cognition and are part of the same informational field."

30. Lakoff and Johnson (1999, 26): "cognitive science and neuroscience suggest that the world as we *know* it contains *no* primary qualities in Locke's sense, because the qualities of things as we can experience and comprehend them depend crucially on our neural makeup, our bodily interactions with them, and our purposes and interests."

31. This does not, however, entail idealism or subjectivism. See note 16.

32. Cognitive scientist, J. J. Gibson, in a tellingly entitled tome, *The Ecological Approach to Visual Perception* (1979, 116), similarly observes that "to perceive the world is to coperceive oneself... The optical information to specify the self.... accompanies the optical information to specify the environment.... The one could not exist without the other.... The supposedly separate realms of the subjective and the objective are actually only poles of attention. The dualism of observer and environment is unnecessary." (Cited in Rosch 1999, 71).

33. This idea of similar causal patterns operating in disparate dimensions is found in other fields as well. Gregory Bateson (1979, 164), for example, similarly argues that "evolutionary change and somatic change (including learning and thought) are fundamentally similar."

34. Maturana and Varela (1980, 12): "The evolution of living systems is the evolution of the niches of the units of interactions defined by their... organization, hence, the evolution of the cognitive domains."

35. This reflects the well-known distinction between two dimensions of dependent arising: the momentary (*kṣaṇika*) dependent arising in which all twelve members of the standard formulation occur concurrently, and in which birth and death are interpreted metaphorically; and the extended dependent arising of conditions (*āvasthika*), in which the same twelve members are interpreted as conditions or states occurring sequentially over three distinct lifetimes (AKBh, *ad* III 24d; Poussin, 65f).

36. See Collins (1982, 43-45) for the early Vedic sense of *loka* as a multidimensional "world" constructed by human action (*karma*), particularly ritual action. Ñāṇananda (1971, 84) well describes the nuanced way in which this term is used in Buddhist thinking: "the world is what our senses present it [to] us to be. However, the world is not purely a projection of the mind in the sense of a thorough going idealism; only, it is a phenomenon which the empirical consciousness cannot get behind, as it is itself committed to it. One might, of course, transcend the empirical consciousness and see the world objectively in the light of *paññā* [wisdom] only to find that it is void (*suññā*) of the very characteristics which make it a 'world' for oneself."

37. We have altered the translation of *vinaya* from "Discipline" to "terms," consistent with one of its core meanings (PED, 623). A similar passage states (Sn 169): "the world (*loka*) has arisen through the six [sense-modalities, including mind], it is made known through the six." Note that

the "world" is known through faculties that are themselves "in the world," not by faculties existing apart from it.

38. "The study of behaviour has now emerged as one of the most central issues in modern evolutionary analysis. With hindsight, it is easy to see why this should be so. After all, natural selection and genetic change depend, as we now interpret Darwin, upon the way in which an animal behaves since its behaviour, in particular everything leading up to the act of reproduction and later the protection of offspring, determines the direction of evolution as a result of differential breeding rates." (Nichols 1974, 264).

39. A pattern which neurophysiologist, Terrence Deacon (1997, 352), notes "has been invoked by most theories of human cognitive evolution."

40. "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, 86).

41. Cited in AKBh ad VI. 3 (Shastri, 887): *Karma ca tṛṣṇā atho avidyā saṃskārāṇāṃ hetur abhisaṃparāye iti*.

42. AKBh *ad* V 1 (Shastri 759; Poussin 106). This refers to a previous passage in the same text: AKBh *ad* IV 1.a (Shastri 567; Poussin 1): *sattvabhājanalokasya bahudhā vaicitryamuktaṃ tat kena kṛtam? ... sattvānāṃ karmajaṃ lokavaicitryam*. See also AKBh *ad* II 56b, 57b, and Schmithausen (1987, 203).

43. Though not fully developed in the earliest Buddhist literature, the afflictive dispositions were carefully analyzed in later traditions. The Theravādin Abhidhamma (*Dhamma-sangaṇi, Visuddhimagga,* etc), for example, enumerates ten (see Nyanatiloka 1977, 77), while the *Abhidharmakośa* (V 1c-d) gives a basic list of six, all of which overlap with the Theravādin list (attachment, aggression, ignorance, pride, false view, and doubt), as well as offers an expanded list of ten (*ad* V 3), wherein 'false view' (*dṛṣṭi*) is divided into five: (1) view of self-existence (*satkāyadṛṣṭi*), (2) extreme views (*antagrāhadṛṣṭi*), that is, eternalism and nihilism), (3) false views based on wrong ideas (*dṛṣṭiparāmarśa*) (4) false views about the efficacy of rules and rituals (*śīlavrataparāmarśa*), (5) false views about causality (*mithyadṛṣṭi*). See, for example, Guenther and Kawamura, *Mind in Buddhist Psychology* (1975, 64-81).

44. AKBh III 19a-d (Poussin, 57-59; Shastri, 433-4): *yathā akṣepaṃ kramād vṛddhaḥ santānaḥ kleśakarmabhiḥ... paralokaṃ punar yāti… iti anādibhavacakrakam*. This is illustrated in another text, *Milinda's Questions* (70f): "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 sensory 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.'"

45. AKBh *ad* V 1a (Shastri 759; Poussin 106): *karmajaṃ lokavaicitrayam iti uktam. tāni ca karmāṇi anuśayavaśād upacayaṃ gacchanti, antareṇa ca anuśayān bhavābhinirvartane na samarthāni bhavanti. ato veditavyāḥ mūlṃ bhavasya anuśayāḥ*.

46. Note that our cited authors use "linguistic" and "linguistic system" nearly interchangeably with "symbolic" and "symbol system," of which language is the most paradigmatic example.

47. "Brain-language co-evolution has significantly restructured cognition from the top-down ...," Deacon (1997, 417) argues, such that "its secondary effects have also ramified to influence the whole of human cognition....even when our symbolic-linguistic abilities are uninvolved."

48. Cognitive scientist, Michael Tomasello (1999, 126) argues that: "The way that human beings use linguistic symbols thus creates a clear break with straightforward perceptual or sensory-motor representations, and it is due entirely to the social nature of linguistic symbols."

49. Tomasello (1999, 215): "the uniquely human forms of thinking.... do not just depend on, but in fact derive from, perhaps even are constituted by, the interactive discourse that takes place through the medium of intersubjective and perspectival linguistic symbols, constructions, and discourse patterns."

50. As neurophysiologist Deacon (1997, 409f) observes, "it is simply not possible 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," that is, by language.

51. As anthropologist Roy Rappaport (1999, 5) has suggested, "It would not, indeed, be an exaggeration to claim that humanity is [language=s] creation."

52. Lakoff and Johnson (1999, p. 268): "The very way that we normally conceptualize our inner lives is inconsistent with what we know scientifically about the nature of mind. In our system for conceptualizing our inner lives, there is always a Subject that is the locus of reason and that metaphorically has an existence independent of the body. As we have seen, this contradicts the fundamental findings of cognitive science."

53. As psychiatrist, Hundert (1989, 107), notes: "What is crucial here is the reciprocal nature of the developments of the capacity to have unitary subjective experiences and the capacity to experience unitary permanent objects. By studying the behaviour of infants, Piaget showed that, in normal human development, the notion of permanent *objects* and the notion of a separate *self* who is experiencing those objects develop together. From the starting-point of symbiosis, the origins of self and object proceed apace."

54. Such "self-representation..." Deacon (1997, 451) argues, "could not be attained without a means of symbolic representation," that is, without language.

55. Tomasello (1999, 195): "There are thus two basic levels of knowledge and understanding...

First is the kind of knowledge that humans share with other animals.... The second level derives from a representational redescription of this procedural knowledge.... Systems of thought emerge from this reflexive activity because self-observation employs all of the categorization and analytic skills that are employed in perceiving, understanding, and categorizing the outside world—in effect the subject perceives, understands, and categorizes her own cognition facilitated by the fact that it is expressed externally in language."

56. As sociologist, Anthony Giddens (1991, 53f), observes: "Self-identity... is not something that is just given... but is something that has to be routinely created and sustained in the reflexive activities of the individual... A person's identity [depends upon].... the capacity *to keep a particular narrative going*."

57. Derived from the Sanskrit root "*man*," "to think, believe, imagine, suppose, conjecture," *manas* (Pali, *mano*) is related to the Latin "*mens*," "mind, reason, intellect," and ultimately to the English "mind, mentation" and "to mean" (PED, 515, 520; SED, 783).

58. "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).

59. The *Abhidharma-kośa*, for example, 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. *cakṣurvijñānena nīlaṃ vijānāti, no tu nīlam; manovijñānena nīlaṃ vijānāti, nīlam iti ca vijānāti*).

60. Sn 834 speaks of considering viewpoints *in* the *manas* (*manasā diṭṭhigatāni cintayanto*) and S I 207 of the "thoughts of *mano*" (*manovitakkā*) (Johansson 1965, 183, 186).

61. Reat (1990, 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."

62. In the *Abhidharma-kośa*, the five sense consciousness are said to be always conjoined with *vitarka* and *vicāra* (thought and reflection). (AKBh *ad* I. 32; Shastri, 88; *savitarkavicārā hi pañcavijñānadhātavaḥ nityam ete vitarkavicārābhyāṃ saṃyuktāḥ*). Two other schools, the Mahīśāsakas (thesis 11), and Dārṣṭāntikas (thesis 23), also argue that *vitarka* and *vicāra* accompany sense consciousness, but the Sarvāstivādins (thesis 95) and the Theravādins reject this (Bareau, 1955, 275, 277).

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

64. Ñāṇamoli (1995, 203) Translation altered slightly for terminological consistency.

65. A II 161: "Whatever is the range of the six spheres of contact, that itself is the range of prolific

conceptualization (*papañca*). And whatever is the range of the prolific conceptualization, that itself is the range of the six spheres of contact" (Ñāṇananda 1971, 21).

66. Ñāṇananda (1971, 25) describes the reciprocity between the proliferation-apperception series '*papañca-saññā-saṅkhā*' 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.*' "

67. *Bodhisattvabhūmi* (35, 2): *prapañcaḥ saṃsāra ity arthaḥ.*. Cited in Schmithausen (1987, 510); see also 509ff, n. 1405, and 522ff. n. 1425.

68. Deacon (1997, 100): "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."

69. Tomasello (1999, 106) in fact defines "a linguistic symbol" as "a communicative device understood intersubjectively from both sides of the interaction."

70. Tomasello (1999, 126): "The way that human beings use linguistic symbols.... is due entirely to the social nature of linguistic symbols."

71. As similarly noted in the penultimate paragraph of this article, our understanding of the our "world" must then take into account three causal dimensions simultaneously, "human beings have cognitive skills that result from biological inheritance working in phylogenetic time; they use these skills to exploit cultural resources [i.e. language] that have evolved over historical time; and they do this during ontogenetic time" (Tomasello 1999, 48).

72. 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: *(*sarvabījakaṃ cittaṃ*) *vipacyate saṃmūrcchati vṛddhiṃ virūdhiṃ vipulatām āpadyate*. This closely parallels passages found in Pāli texts, S III 53, D III 228: *viññāṇaṃ... viddhiṃ virūḷhiṃ vepullam āpajjeyya*. (Schmithausen, 1987, 356, n.508).

73. Comprised of the prefix "*upa*," "towards, near, together with," plus the noun "*ādāna*," "receiving, taking to oneself" (SED), *upādāna* may refer to both an active process and a passive product, both a conditioning and a conditioned state. It is not only "grasping, attachment, finding one's support by, nourished by, taking up," but also "fuel, supply," "the material out of which anything is made," or even "substratum by means of which an active process is kept alive or going" (Apte: 471; PED: 149). See also Schmithausen (1987, 72).

74. All the Sanskrit terms in this passage are reconstructed from the Chinese and Tibetan. Schmithausen reconstructs this last phrase as *nimitta-nāma-vikalpa-vyavahāra-prapañca-vāsanā-upādāna.* The import of this dauntingly long (and proliferating!) string of concepts is well summarized in Schmithausen's definition (1987, 357, n.511) of the first term, *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."

75. *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-vijñapti*) means the continuous, uninterrupted perception of the continuity of the world based upon that very *ālaya-vijñāna* which has inner appropriation as an object. 1.b)A.3. Thus, one should know that the way *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."

76. Skarda's (1999, 83) notion of "phenomenal fabric" is suggestively similar: "Sense organs alone do not create the percept. The percept is the articulated phenomenal event as that articulation is used by the whole organism.... The 'phenomenal fabric' is but the cloth out of which the percept is articulated... Its phenomenality consists in the fact that it is a complex, but as yet undifferentiated, sensory content *directly apprehended by* the organism without the intervention of neural activity. It is not articulated into features nor is it as yet 'objectified' by the sense organ, and hence is not to be identified with the percept, but it is the phenomenal basis for all subsequent levels of perceptual system functioning." This parallels certain characteristics of *ālaya-vijñāna*. *Ālaya-vijñāna*'s objects are not only undifferentiated or undelineated, but this *ālaya* awareness is also said to pervade the whole body.

77. *Saṃdhinirmocana Sūtra* (V.4-5): "The six groups of cognitive awareness… arise supported by and depending upon (**saṃniśritya pratiṣṭhāya*) the appropriating consciousness (*ādāna-vijñāna*; another synonym of *ālaya-vijñāna*)."

78. *Pravṛtti-Portion* of the *Yogācāra-bhūmi* (D.5a7f; P.6a5f; T.580b29f, 1019c6f):

4.b)A.1.(a): "the mind (*manas*) whose mode is conceiving (*manyanā*) 'I-making' (*ahaṃkārā*), the conceit 'I am' (*asmimāna*), always arises and functions simultaneously with *ālaya-vijñāna* ... That [mind] has the mode of taking *ālaya-vijñāna* as [its] object and conceiving [it] as 'I am [this]' (*asmīti*) and '[this is] I' (*aham iti*)."

4.b)B.4.: "The mind which was explained above always arises and functions simultaneously with *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 (*satkāyadṛṣṭi*), the conceit 'I am' (*asmimāna*), self-love (*ātmasneha*), and ignorance (*avidyā*)."

This is the genesis of what will later be called "afflictive mentation" (*kliṣṭa-manas*). Here, too, the Sanskrit terms are all reconstructions.

79. *Pravṛtti-Portion* (D. 5b4-6; T.580c9-13); 4.b)A.2.: *yid kyi rnam par shes pa de ni yid la brten pa zhes bya ste / rgyu mtshan gi yid ma 'gags na rnam par rig pa 'i 'ching ba mi 'grol la / 'gags na ni de 'grol ba 'i phyir ro*). See Schmithausen (1987, 486f, n.1293-98).

80. *ad* MSg I.58 (Bh 336c9f; bh 169a2): *gang gis bdag zhes bya ba dang / bzhan zhes bya ba'i bye brag 'dir 'gyur par byed do*).

81. "Although the contents of meaning are largely social in origin, the mechanisms of meaning are biological and have to be understood in terms of brain dynamics" (Freeman, 2000, 9).

82. "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.'... cognition is not a representation of an independent, pregiven world, but rather a bringing forth of a world.... not *the* world, but *a* world, one that is always dependent upon the organism's structure. Since individual organisms within a species have more or less the same structure, they bring forth similar worlds" (Capra 1998, 269f).

83. AKBh *ad.* IV 1.a. (Shastri, 567; Poussin, 3. 1: *sattvānām karmajaṃ lokavaicitryam*). Also *ad* II 56b, 57b. Asanga's *Abhidharma-samuccaya* (ASBh) (T.31.679b24B7, P.102b6B8 f.): *las thun mong ba zhes kyang 'byung/ las thun mong ma yin pa zhes kyang 'byung /... thun mong ba gang zhe na/ gang snod kyi 'jig rten rnam par 'byed pa 'o// thun mong ma yin pa gang zhe na/ gang sems can gyi 'jig rten rnam par 'byed pa 'o*).

84. MSg I.60: "The common [aspect of *ālaya-vijñāna*] is the seed of the receptacle world (*bhājana-loka*). The uncommon [aspect of *ālaya-vijñāna*] is the seed of the individual sense-spheres (*prātyātmikāyatana*)." The term for "common," "*sādhāraṇa*," means "having or resting on the same support or basis" (SED: 1202).

85. (Bh 337a28ff; bh 169b5): *de lta bu 'i rnam pa can gyi kun gzhi rnam par shes pa med na gang sems can thams cad kyi thun mong gi longs spyod kyi rgyur gyur pa snod kyi 'jig rten yod par mi 'gyur ro*.

86. *ad* MSg I.60 (U 397c12f; u 267a8-268a1): *de la thun mong ni snod kyi 'jig rten gyi sa bon gang yin pa 'o / / zhes bya ba ni snod kyi 'jig rten du snang ba 'i rnam par rig pa rnams kyi byed rgyu 'o / / thun mong ba ni rang gi las dang mthun pa 'i rnam par smin pa 'i dbang gis de la spyod pa po thams cad la der snang ba 'i rnam par rig pa skye ba 'i phyir ro*). For "cause" (*kāraṇa-hetu*) Tibetan has *byed rgyu*, but Chinese only *yin*. For "representations" (*vijñapti*) Chinese reads merely *shih*, which is usually "*vijñāna*." For "force" (*adhipatibala*), Chinese has *tseng shang li*, while Tibetan has only *dbang*, **bala*.

87. *ad* MSg I.58 (Bh. 336c5f; bh. 168b7f ; U 397a24-b4; u 266b4-267a1).