# Buddhist Modernity and the Sciences

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The world's religious traditions are all facing a variety of challenges in the modern age. Some of these come from the skeptical attitudes incumbent upon modern science, some from the secularizing tendencies inherent in democratic politics, and some from the relativizing effects accompanying our pluralistic world. This is no less true for Indian Buddhism and the traditions that derive from them in other parts of South and East Asia. Like everyone else, they are compelled to participate in our modern world in all its confusing and challenging complexity. The question is how they will do so. Will Buddhists attempt to turn their back on modern science and pluralistic democracy, on the grounds that these are not relevant to their higher spiritual aims of awakening all being and alleviating their suffering? Or will they engage the modern world as the only arena where such aims and activities take place? The answers to these questions will, no doubt, be as diverse as the modern world itself. In this talk, I will outline one approach to these challenges, arguing that Buddhists need to fully engage the modern world not only to keep their own traditions relevant in a new era—as historically they have always done—but also because this is the best way of pursuing the traditional aims of alleviating suffering and liberating sentient beings. I will, per force, focus on the relation between Buddhist thought and science and the role that science could possibly play in engaging Buddhism more fully with modernity. I do this confident

that the richness of Indian philosophical traditions in general, and of Buddhist traditions in particular, have much to contribute to the modern world.

I intend to make only a few general points based on the conviction, first, that science provides an understanding of how the world works that, perhaps paradoxically, reinforces more than it challenges traditional Buddhist views (although most Buddhists don't know this!), and, second, that a scientific education is absolutely necessary for enabling both Buddhist individuals and the various Buddhist traditions to engage the modern world in a creative and constructive manner. This is my concern here: that Buddhist cultures and traditions find ways to engage the entire modern world—including science—just as they have previously engaged, and transformed, the traditional cultures of Asia.

As many know, throughout its history, Buddhist teachers and thinkers have vigorously participated in the religious, intellectual and artistic cultures around them. They have both been enriched by and have themselves deeply enriched these various cultures and in this way Buddhist traditions have become important parts of the cultures of modern-day India, Nepal, Bhutan, Tibet, Mongolia, Sri Lanka, Thailand, Burma, Cambodia, Laos, Vietnam, China, Korea and Japan—in effect, all of Asia.

Buddhists have been able to do this precisely because they have been deeply engaged in these surrounding cultures, and because they found ways to express their particular insights and sensibilities in ways that were appropriate to the time and place. This is why we can now speak of Newari Buddhism, or Singhalese Buddhism or Japanese Buddhism as distinctive forms of Buddhism.

My point is that now is not the time for Buddhists to stop this process. We live in a time of great promise and challenge. We live in a radically pluralistic age, in which we can all access every major culture in the world. And we live a radically fragmented age, one

in which modern science and technology not only influence, but also challenge, all our previous assumptions about how the world works.

In my view, Buddhists (and all serious religious thinkers for that matter) need to engage this modern world, in all its pain and glory, with all its achievements and its deep, deep shadows. But, even more, I think the modern world needs the kinds of perspectives that Indian thought in general and Buddhist thought in particular provides. And Buddhists cannot provide this if they do not have a modern scientific education.

In the widest sense, education is a transformative process. Children start with little specific knowledge about the world and they end up understanding a great deal, not just the details of this or that field, like physics or history or literature, but about how the world works in a more general way. And it is last point I want to dwell for on: modern science as a foundation for a deeper understanding of how the world works and the reasons why modern Buddhists should be actively involved in it.

I want to make two specific points, first in brief and then at more length.

First and foremost, traditional Buddhists should find much to embrace in science education, since it accords so well with their general theories of causality. Modern science—at least the way I see it—is one long lesson in dependent arising, the central Buddhist notion that phenomena in the world only occur through various causes and conditions. We learn in one field after another that we can only understand how the world works if we analyze it in terms of regular patterns of causal interaction. What I mean by this last phrase is that each discipline develops a particular set of terms and concepts to analyze the phenomena, the events, they are interested in and then describes how these phenomena occur in terms of the regular, recurrent relationships between these concepts.

The sciences thus teach about cause and effect in the natural world in a way that not only basically accords with the Buddhist idea of dependent arising, but that also implies that causality only works if there are, as Buddhists have long contended, no unchanging essences, no *svabhāva*. This is implicit in all the sciences and modern Buddhists should see it as an affirmation of their basic worldview.

Second, Buddhists insights also agree with some of the most difficult problems of the modern world: the problems caused by the quest for self-identity (*ātma-graha*). All the social sciences teach that personal and group identities are social constructions, or social agreements. And some of them recognize that creating and protecting these constructed identities often leads to social and political conflicts. The core Buddhist insight is that the quest for such an identity eventually leads to more suffering. This insight needs to become one of the bases for our understanding of modern life. Otherwise, I fear, we have only a future of conflict and bloodshed.

In sum, I want to make two general points: one about causality and non-essentialism, and the other about self-identity and suffering.

## CAUSALITY

Modern Buddhists have much deeper reasons to study science than the obvious reason that scientifically illiterate people will be left in the dust-heap of history, as the adage goes. More than any of the other great religions, to my knowledge, Buddhist philosophy has deep similarities with the scientific approach, similarities which can and should be part of every modern Buddhist's education.

Specifically, both science and Buddhist thought focus on questions of causality, of how things come to be rather than what they are. This is a crucial point that is easily overlooked and underestimated. What I mean here is that science does not ask what things are *in their essence*, it looks for the causes and conditions that bring things about. For example, scientists look for the causes

of tropical storms like the one that hit Myanmar this month (May, 2008), or the causes of a disease, like tuberculosis or leprosy. They do this in order to predict or prevent their occurrence and thereby reduce human suffering. Amelioration of suffering is an important dimension of science as a human endeavor.

Scientists are not interested in what the unchanging essence of a storm or a disease might or might not be, since an *unchanging* essence is not something that comes about. It is at best a working definition, a way to define a problem or event whose causal conditions will then be investigated. According to Karl Popper, one of the great philosophers of science in the 20th century, "essentialism is mistaken in suggesting that definitions can add to our *knowledge of facts*." (Popper, *Conjectures and Refutations*, 1974, p. 20). As he further explains (*The Open Society and its Enemies*, 2nd ed., 1952, vol. II, p.14):

> The scientific use of definitions... may be called its *nominalist* interpretation, as opposed to its Aristotelian or *essentialist* interpretation. In modern science, only nominalist definitions occur, that is to say, shorthand symbols or labels are introduced in order to cut a long story short.

This well accords with Buddhist views. Long ago, Buddhist philosophy came to the conclusion that definitions are merely conventional designations (*prajñapti*) for what are in principle an unlimited set of causes and conditions.

It is well known that Buddhist thought also emphasizes causality and for similar reasons: an understanding of *how things come to be* allows us to control, prevent or even reverse their occurrence. As the Buddha said, "Whatever is subject to origination is all subject to cessation" (*Samyutta Nikāya* V 424). And—this is crucial—whatever is subject to causes and conditions cannot have or be an unchanging essence. This follows, of course, the definition of essence or Being found in much of traditional Hindu thought. An

essence is by definition that which is independent and unchanging. But discovering the essence of something—if indeed there were one—does not in and of itself reveal how it works, how it occurs and ceases. We don't need to know what the 'essence' of tuberculosis is, we need to prevent it from occurring in people and cure it when it does.

The Buddha took a similar approach to the problem of life. He was looking for the etiology—the causes—of the dis-ease of the human condition, in order to bring about its cure, freedom from suffering, for which he prescribed an appropriate antidote, the practice of Dharma. Since he defined the problem in terms of what arises—i.e. the experience of *duḥkha* —the solution is defined in terms of what ceases. Our suffering arises, he says, from two closely related causes: first, the misconception that we or any part of us is actually an unchanging or uncaused unity, and, second, based on this, the various actions that we perform, the karma, in our attempts to permanently secure our impermanent existence. Since we cannot make the impermanent permanent, we will continue suffering until we realize the futility of the attempts and give it up. A proper understanding of causality, then—both finding the cause of suffering as well as acknowledging the causal nature of phenomena themselves—is as central to the Buddhist scheme of things as it is to science.

My point here is not only that a basic scientific education is necessary for all modern people, regardless of their cultural or religious background, which I think is true, but that the actual details of different scientific fields reaffirm, over and over again, these basic Buddhist views on causality and its concomitant notion, a lack of unchanging essence.

Let me give a few examples to illustrate this.

## EVOLUTIONARY PERSPECTIVES

The modern theory of evolution through natural selection states that the physical forms and behavioral characteristics of a given species have come about as a result of the various actions of its ancestors in interaction with their natural and social environments, specifically, those actions that led to greater reproductive success. Generally speaking, those actions were motivated by the desire to preserve their own existence, the desire for activities that led to reproduction, and the desire to protect and secure whatever facilitated these two. That is, self-preservation, sensual desire and protective aggression have been instrumental—not accidental—in bringing about the life forms we see today. In this view, species are, in effect, created by their own actions. They are not created by the will of God, they are not completely determined beforehand, nor are they caused by the actions of a single, unchanging self. They—and this includes us human beings as well—are the result of innumerable, and accumulating, transformations over very long periods of time in a complex and interactive causal process.

And since each species is continuously evolving due to ongoing causes and conditions, they do not have a single, fixed essence. Not only has "Darwinism... banished essentialism—the idea that species members instantiated immutable types," according to one historian of science. (Richards, *The Emergence of Evolutionary Theories of Mind and Behavior*, 1987, p. 4), but the very notion of a species essence has actually obstructed scientific progress. As the eminent late philosopher of biology, Ernst Mayr (*Toward a New Philosophy of Biology* 1988, p. 15f) argues:

> The ability to make the switch from essentialist thinking to population thinking is what made the theory of evolution through natural selection possible.... The genotype (genetic program) is the product of a history that goes back to the origin of life, and thus it incorporates the 'experiences' of all ancestors.... It is this which makes organisms historical phenomena.

That is, as the Buddhists would say, a given species is a dependently arisen phenomena which results from previous actions whose effects have accumulated over the course of countless generations. Contrary to philosophers and humanists the world over, there is no unchanging human essence, or rather, no essence that can be discerned by a causal analysis.

But the theory of evolution explains more than just the physical form of a species, it also addresses behavioral characteristics, including the dispositions to act in certain, species-specific ways. In other words, human beings have certain, specific human ways of acting and thinking that not only set us apart from other species but that are also influenced, to a large degree, by the results of the past actions of our ancestors. This includes the way we talk, the way we interact with each other, even the way we imagine 'selves' and 'others.' We are thus not only what we eat, but also—according to evolutionists—the result of what we, and all our ancestors, have thought and said and done.

As evolutionary biologist, David Barash, (*The Whisperings Within: Evolution and Origin of Human Nature*. 1979, p. 203) explains:

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

Buddhist philosophers have also emphasized that both the physical forms we embody today, as well as many of our most basic cognitive processes and dispositions, are the results of past actions that have

been built up over countless lifetimes. And many of these actions have had similar drives: self-preservation and sensual desire, and the aggressive pursuit of these first two. One *sūtra* states that "the causes of living forms (*saṃskārā*) in the future are action, craving and ignorance." More specifically, as the great 5th century Buddhist philosopher, Vasubandhu, explains: "the world (*loka*) in its variety arises from action ([from] *karma*). [The effects of these] actions accumulate due to the power of the afflictive dispositions (*anuśaya*)" (*Abhidharmakośa-bhāṣya ad* V 1), that is, the dispositions toward a view of self-existence, toward sensual desire, and aggression and so on.

I am not pointing out these parallels as an exercise in Buddhist triumphalism, as if centuries ago Buddhists already knew all about evolution by natural selection. In fact, the two disagree profoundly about the specific mechanisms of causal transmission. Evolutionary biologists talk of gene pools and populations while Buddhists speak in terms of the karmic potential associated with individual "mind-streams" traversing across multiple lifetimes. These are important and likely irreconcilable differences.

Rather, I wish to point out that traditional Buddhists need not see the theory of evolution as a threat, as some people in some religious traditions do, but might see it as a thought-provoking parallel to their own models of causality driven by the actions of sentient beings. Vasubandhu, for example, constantly debated the leading Hindu philosophers of his time, and in doing so he developed and expanded the range and influence of Buddhist philosophy both in India and beyond. This tradition should continue today. To keep a tradition vibrant, intellectually and otherwise, it must continuously engage contemporary issues. Philosophy of biology is a ripe topic for such an exchange.

ONE MORE IMPORTANT AND INTRIGUING EXAMPLE.

Modern cognitive scientists investigate the brain in order to understand how mind works. Although many of them operate on materialist assumptions—that mind is simply a function of the brain—they nevertheless have enough in common with Buddhist analyses of mind to make a productive dialogue possible and desirable.

Specifically, cognitive scientists look for the causal patterns that underlie consciousness and other cognitive processes. One of their starting points is the assumption that consciousness is a process—or the result of multiple processes—which depends upon various causes and conditions that can—at least in principle—be discovered and understood by the scientific method. Consciousness, in this view, is not a Cartesian spirit or a substantial entity existing apart from, but somehow still controlling, our bodily processes. It is very much a phenomenon that arises through causes and conditions, as the Buddhists would say.

Cognitive scientists have therefore uniformly concluded, almost without exception, that our common notion of self as a substantial entity residing at the center of all our actions and experiences is simply unfounded; there is no scientific support for such a notion at all. As the important cognitive scientists, Lakoff and Johnson, (*Philosophy in the Flesh: The Embodied Mind and its Challenge to Western Thought*. 1999, p. 268) declare:

> 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… this contradicts the fundamental findings of cognitive science.

This unwelcome but inescapable conclusion has caused considerable consternation in the scientific community: for scientists, like most

other human beings, implicitly or explicitly hold such a notion of self. As neuroscientist, Marvin Minksy (*Society of Mind*, 1986, 306f) laments: "We each believe that we possess an Ego, Self or Final Center of Control... We're virtually forced to maintain that belief, even though we know it's false."

Michael Gazzaniga, world-famous for his research on the two hemispheres of the brain, depicts this predicament even more colorfully—and I quote:

> 'Goddamn it, I am me and I am in control.' Whatever it is that brain and mind scientists are finding out, there is no way they can take that feeling away from each and every one of us. Sure, life is a fiction, but it's our fiction and it feels good and we are in charge of it…. This is the puzzle that brain scientists want to solve… the gap between our understanding of the brain and the sensation of our conscious lives.
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> (Gazzaniga, *The Mind's Past*, 1998, pp. 172)

This 'explanatory gap,' as it's called—between our scientific understanding of the brain, which reveals no "Final Center of Control," and our nearly innate sense to the contrary, that we are indeed such an agent—is also the puzzle that Buddhist philosophers want to understand and resolve: why are we "virtually forced to maintain a belief [in self], even though we know it's false"? Even though it causes suffering to oneself and others? Modern science has some interesting, *Buddhistic*, answers to these questions as well.

First, we must discern how this sense of self comes about in the first place, in other words, understand its causes and conditions. Once again, it will be useful to turn to evolutionary theory. In his sweeping book, *The Symbolic Species: The Co-evolution of Language and the Brain*, Terrence Deacon argues that what distinguishes human beings is not so much the size of our brains as its special mode of organization: human brains support systems of symbolic reference, i.e. language.

These linguistic capabilities did not, of course, spring fully formed out of the head of Zeus. They are part of the accumulative, constructive and interactive processes of evolution. As symbolic communication 'dependently arose' in early hominid species it became a powerful evolutionary force in its own right, radically and irrevocably changing the structures and processes of the human brain. This momentous change centered on an increasingly enlarged prefrontal cortex, where such symbolizing processes are concentrated. As language use and this 'prefrontalization'—as it's called—mutually reinforced each other, the symbolic-linguistic mode of cognition which is dependent upon them came to dominate other, more sensory, cognitive processes. "Brain-language co-evolution has significantly restructured cognition from the top-down ...," Deacon argues (1997, p. 417), such that "*its secondary effects have also ramified to influence the whole of human cognition*… even when our symbolic-linguistic abilities are uninvolved." [1] As a consequence, Deacon (p. 416) continues, "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."

Foremost amongst these themes and narratives is, of course, our sense of self. "Self-representation... could not be attained without a means for symbolic representation." Deacon he continues (451).

> It is a final irony, that it is the virtual, not actual, reference that [linguistic] 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. (p. 452)

Buddhist analyses of mind also connect reflexivity, and the linguistic categorizations associated with it, with cognitive processes (*vijñāna*) that have been built up through the accumulating cycles of dependent

arising. These are closely associated with 'mental' cognitive awareness (*mano-vijñāna*), which occurs in relation to ideas and concepts, which are, of course, closely related to speech in classical Indian thought. Thus, the sense of self in early Buddhist thought is typically considered a linguistic phenomenon, and referred to as such in Sanskrit and Pāli: *asmi iti*, (which we find in Patañjali's *Yoga-sūtra*s as well). This implies no ontological existence, however, it is merely a designation (*prajñapti*), a 'virtual reality,' as Deacon puts it, in which we are deeply enthralled.

One reason "we cannot help but see the world in such categorical terms," is that these linguistic influences are part of the neurological structures of a mature adult, and as such they occur automatically, without our awareness of them. In this sense, they are themselves constitutive conditions *for* human cognition rather than direct products *of* cognition. As cognitive scientists Lakoff and Johnson (1999, 18f) point out:

> Categorization is ... a consequence of how we are embodied.... We categorize as we do because we have the brains and bodies we have and because we interact in the world the way we do... 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.

This, too, in paralleled in Buddhist thought, particularly Yogācārin Buddhism, my own area of research. Yogācārins pointed out long ago that such categorizations are an important influence on the content and structure of unconscious processes. The subliminal processes called *ālaya-vijñāna* occur in tandem with not only the material sense faculties, but also the "predispositions toward conventional images, names, and concepts." And these in turn support and facilitate conscious cognitive processes (*pravṛtti-vijñāna*).

Amongst these conventional names and concepts is, of course, a sense of self, also recognized by Yogācārins as occurring

unconsciously, i.e. a *kliṣṭa-manas*. This subliminal mode of mind is always "conceiving (*manyanā*) 'I-making' (*ahaṃkāra*), the conceit 'I am' (*asmimāna*), and always occurs simultaneously with the unconscious processes (*ālaya-vijñāna*)," thinking "I am this" (*asmīti*) and 'this is I" (*aham iti*). It is, as the scientists just quoted would readily recognize, a fully embodied, yet quite fictional sense of self that we "virtually forced to maintain a belief in," whether we know it or not, whether we want to or not.

My point here is that even more than the other sciences, Buddhists have much to contribute to cognitive science—as of course do other yogic traditions of India (which unfortunately, I have little expertise in). Buddhists have been thinking and practicing in these terms—i.e. through an analysis of the patterned arising of consciousness—for many, many centuries. This is not to say that Buddhists have the last word on the subject, far from it. But they can provide interesting perspectives—and, I should add, willing subjects—for scientists to contemplate.

But Buddhists can only contribute to this work if they know about the basic methods and findings of cognitive science. And this requires modern education. To paraphrase a expression popular in America, what would Vasubandhu do?

## IDENTITY

This brings us to my 2nd point, which will be shorter but less pleasant.

Buddhist thinkers need to know about the social sciences not only in to be able to share their particular insights into the construction of self-identity, but even more importantly in order to help apply these insights to the problems that plague modern societies. This is an urgent and world-wide problem that requires a variety of perspectives to understand and address.

As suggested by the cognitive scientists above, modern scientists—and I include social scientists here—take it *as a matter of course* that our identities, our explicit or implicit sense of who and what we are, are a complex product of various causes and conditions. Specifically, they consider identities to be 'social constructions' that have developed over time through recurrent interaction with our families, friends, and communities. Such selves do not and cannot stand alone and they never have. This is one of the basic working assumptions in the social sciences and its parallels with Buddhist thinking should be obvious: Buddhist thinkers have long considered the notion of self to be just another designation (*prajñapti*) or false concept (*vikalpa*). As the Singhalese monk and scholar Bhikkhu Ñāṇananda (*Concept and Reality in Early Buddhist Thought*. 1971, p. 11): "The label 'I' thus superimposed on the complex contingent process, serves as a convenient fiction of thought or a short-hand device."

What is less obvious, though, is that both traditions also agree, first, that our sense of self-identity is continuously constructed as a defense against the anxiety created by the impermanence and fragility of existence, and, second, that this quest for self-identity is not only futile—since it can never overcome impermanence, but also self-defeating—since it becomes a source of suffering in its own right. I quote two of the most eminent sociologists of the late 20th century.

British sociologist, Anthony Giddens (*Modernity and Self-Identity*, 1991, p. 53) observes, "Self-identity…is not something that is just given... but has to be routinely created and sustained in the reflexive activities of the individual." "Self-identity is inherently fragile," he continues (p. 185), because it "has to be created and more or less continually reordered against the backdrop of the shifting experiences of day-to-day life and the fragmenting tendencies of modern institutions." That is, impermanence and uncertainty.

But to grasp on to self-identity in this way creates even more problems. As Peter Berger explains:

> On the one hand, modern identity is open-ended, transitory, liable to ongoing change. On the other hand, [this] subjective realm of identity is the individual's main foothold in reality. [the problem is that] something that is constantly changing is supposed to be [one's real being] *ens realissimum*. Consequently it should not be a surprise that modern man is afflicted with a *permanent identity crisis*. (Berger, Berger and Kellner, *The Homeless Mind: Modernization and Consciousness,* 1973, p. 78)

In other words, our very attempt to grasp onto something as slippery as self-identity actually exacerbates our insecurity about identity. The cure is as bad as the disease—maybe worse.

These ideas, articulated by two of its major theorists, are central to mainstream sociology. The parallels and commonalities with Buddhist thought here are also obvious. The construction of self-identity is both driven by a misdirected attempt to escape impermanence and suffering, and a cause for further suffering. We are caught, in short, in a vicious circle—which is the basic sense of the term *saṃsāra*. But Buddhist thinkers need to know about this if they are going to meaningfully participate in this aspect of the modern world.

Even more importantly, I think Buddhists need to bring their voice to discussions about national and ethnic identity, as difficult and sensitive as these may be. For if the sociologists and Buddhists agree that self-identity is a construct that both reflects and reinforces the anxiety of modern life, they also agree that these constructions are strongly conducive to ethnic conflict and violence.

That is to say, that we typically not only imagine that individuals have true, unchanging, essential self-identities, but we also imagine that whole groups of people have such unchanging essences as well, which set them apart from one another by supposedly intrinsic and insurmountable differences. As anthropologist, Eric Wolf, warns:

> By endowing nations, societies or cultures with the qualities of internally homogeneous and externally distinctive and bounded objects, we create a model of the world as a global pool hall in which the entities spin off each other like so many hard and round billiard balls. Thus it becomes easy to sort the world into differently colored balls. (Wolf, *Europe and the People without History*, 1982, p. 6)

When we imagine that group identities are something intrinsic, real and unchanging, then we can easily sort the world into differently colored, differently cultured, and differently classified groups of people who appear hermetically sealed off from one another. They don't interact, mingle or merge; they merely bump into and bounce off each other with more or less friction as the case may be.

But while self-identities need our constant imagination to remain viable, no imagination is necessary to see the results of sorting people into intrinsically distinct groups set apart from each other: we read about communal, racial, and religious conflict every day in every newspaper in every country in the world.

Like intelligent and good-willed people the world over, modern Buddhists must address these public issues by—in terms of the traditional metaphor—unfolding their lotus flowers of clarity and compassion in the swamp of our confused and conflicted times. But they cannot fully do this unless they can also communicate, like Vasubandhu did, in the languages and concepts of the times—a large part of which are now the languages and concepts of the natural and social sciences.

If modern science, as I suggested earlier, is one long lesson in dependent arising, then it is also part and parcel of the perennial Buddhist quest to understand and alleviate suffering wherever and however it occurs. As Nāgārjuna famously put it (XXIV 40): "Whoever sees dependent arising also sees suffering and its arising and its cessation as well as the path." Modern science can and should be a means toward this altruistic aim.

## Notes And References

1 The primatologist and child developmentalist Michael Tomasello concludes that "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." (Tomasello, The Cultural Origins of Human Cognition [Cambridge: Harvard University Press, 1999], 215).