

Donald S. Lopez Jr.'s Buddhism and Science: A Guide for the Perplexed

with Peter Harrison, "A Scientific Buddhism?"; Thupten Jinpa, "Buddhism and Science: How Far Can the Dialogue Proceed?"; Donald S. Lopez Jr., "The Future of the Buddhist Past: A Response to the Readers"

BUDDHISM AND SCIENCE: HOW FAR CAN THE DIALOGUE PROCEED?

by Thupten Jinpa

Abstract. On the stage of the religion-and-science dialogue, Buddhism, especially Tibetan Buddhism, is a late arrival. However, thanks primarily to the long-standing personal interest of the Dalai Lama, the Tibetan tradition he represents has come to engage deeply with various disciplines of modern science. This essay follows the active engagement that has occurred particularly in the form of the biannual Mind and Life dialogues between the Dalai Lama and scientists. From the perspective of an active participant, I present the careful deliberations that ensure constructive parameters for these dialogues so that no one side can exert a hegemonic voice. I explore the challenges that are likely to confront the Buddhist side from its encounter with science, particularly with respect to its worldview. I identify specific areas where the two sides can and do engage in concrete collaboration, especially with respect to investigating healthy qualities of the mind and the effects of conscious mental training for attention and emotion regulation. Finally, I explore the question of the possible impact of this dialogue on modern science.

Keywords: Abhidharma psychology; contemplative science; the Dalai Lama; dependent origination; Dharmakirtian epistemology; Gendün Chöphel; Mind and Life dialogues; Nagarjuna; nonessentialist ontology; philosophy of emptiness; principles of nature; science of meditation; Tibetan Buddhism

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TIBETAN BUDDHISM'S ENGAGEMENT WITH SCIENCE:
A BACKGROUND

On the stage of religion-and-science dialogue Buddhism is a latecomer, and within Buddhism, the Tibetan tradition is definitely a late arrival. Recent scholarship, especially by Donald Lopez Jr. (2008), has drawn attention to the historical context of the origins of this dialogue, especially the assertion that Buddhism is the most scientific religion. Research demonstrates that such claims are a product of the colonial encounter, as Buddhist leaders—in Sri Lanka, China, and Japan—sought to rebut the accusation that Buddhism was a form of superstition. Lopez's work also calls for the need to be sensitive to the changing characterizations of "which Buddhism" and "what science" we are referring to when we speak of Buddhism-and-science encounter.

I focus here on the ongoing dialogue between Buddhism and science. We need to appreciate the complexity of the phenomenon. Scientists possess different degrees of personal engagement in relation to Buddhism as a dialogue partner. Some scientists are interested in engaging with Buddhism to expand their horizons; others are themselves Buddhists and seek to integrate their scientific worldview with that of Buddhism. In the latter category are the late Francisco Varela and the late Victor Mansfield as well as Christopher de Charms, Daniel Brown, Gerald Du Pre, and so on. Then there is the Buddhist world, within which there are two quite different Buddhist representations. One we might call "the traditional Buddhist voice," such as that of Tibetan Buddhism; the other is the voice of the Western Buddhist. Although each may claim to represent the voice of Buddhism in the dialogue, where the two are coming from may be quite different. The traditional Buddhists come to the dialogue with Buddhist worldview as their inherited intellectual tradition, while the Western Buddhists come to the conversation with the scientific worldview as their inherited intellectual tradition. Clearly, this fundamental difference will affect the motivation, purpose, and conception of the Buddhism-and-science encounter. In this essay I focus principally on the traditional Buddhist perspective, especially that of my own Tibetan tradition, as it engages with science and its dominant worldview.

Tibet, a latecomer on the scene of modernity, did not feel the need to engage with science and the scientific worldview for a long time. It was only in the 1930s, when the brilliant Tibetan scholar Gendün Chöphel went on a twelve-year journey that took him through British India and Sri Lanka, that the Tibetan tradition finally came to encounter modern science. Toward the end of his seventeen-part journal recording his observations and experience, Gendün Chöphel composed a plea to his fellow Tibetan thinkers in which he urged engagement with modern science for the sake of, if nothing else, the survival of the cherished Buddhist faith.

Elsewhere I go into the details of Gendün Chöphel's open letter and its subsequent history (Jinpa 2003). Interestingly, even at this early stage, the author insightfully identifies four specific areas where there could be fruitful encounter between Buddhism and science. First, he singles out the modern scientific understanding of matter as dynamic, perhaps a reference to Albert Einstein's famous equation $e=mc^2$, as providing a powerful confirmation of the fundamental Buddhist insight into *anitya*, the ever-fluctuating, impermanent nature of things. A second key area where he sees a striking convergence is in the concept of relativity. He draws attention particularly to Nagarjuna's thought wherein all notions of absolute—whether of time, matter, or consciousness—are rejected and where all things, in terms of their existence and even their identity, are understood within the framework of utter contingency, of the interconnected network of relationships. This is the philosophy of emptiness, *shunyata*. The third area Gendün Chöphel identifies for special focus is the scientific insight into how our perception of the world is determined by our sensory faculties and the representations they produce. He takes this to entail the rejection of any naive standpoint that somehow our perceptions objectively mirror reality. In delving into this theme, he brings the sophisticated epistemology of Dignaga and Dharmakirti into contact with scientific views. Fourth, he observes striking parallels between the neurobiological understandings of the human body and the human physiology found in the Vajrayana Buddhist texts.

Gendün Chöphel's open letter never received the attention it deserved; in fact, it came to be published only in the second half of the twentieth century. However, for our understanding of the nature and scope of the dialogue between Tibetan Buddhism and modern science, his observations prove most insightful. Already at this very early stage he intuitively identifies the most fruitful areas for dialogue between Buddhism and science. Along the lines of Sri Lanka's Buddhist modernists, he envisions the possibility of modern scientific observations, especially those based on sophisticated instruments, as confirming age-old Buddhist concepts such as universal impermanence, the insubstantiality of all things, and dependent origination. He sees neuroscience and modern psychology as providing proof and confirmation of the key elements of Buddhist epistemological theories, especially those of Dharmakirti. He envisions the possibility that neurobiology may provide a way of empirically understanding the sophisticated physiology of Buddhist tantra, with its concepts of channels, winds, and drops.

In brief, what Gendün Chöphel brings to the dialogue from science is its empirical observations, and the outcomes based on these observations, that may have direct resonance within Buddhist thought. What he omits is as telling as what he includes. Nowhere does he bring the Buddhist Abhidharma cosmology into the picture or look at the materialist assumptions of the scientific conceptions of mental phenomena.

Interestingly, His Holiness the Dalai Lama's engagement with science proceeds according to a strikingly similar framework, even though the Dalai Lama came across the open letter only in the 1980s, when his own dialogue with scientists was already in its second decade (The Dalai Lama 2008). Thanks to the Dalai Lama's personal enthusiasm for science, today interest in modern science enjoys unprecedented prominence and seriousness within Tibetan monastic circles, especially among the younger generation. Formal science education is on its way to being incorporated into the standard curriculum of scholastic Tibetan monastic institutions. The Dalai Lama's dialogue with scientists also has led to the development of an intellectual discourse wherein Buddhist scholars engage in conversations with scientists from a wide range of disciplines, including quantum physics, neuroscience, and psychology. Perhaps the most promising field so far has been neuroscience, where rigorous experiments involve Buddhist monks, not simply as experimental subjects but some taking active roles in the actual designing of the experimental protocols as well as expanding the conceptual frameworks within which to examine and understand mental phenomena. I briefly review here the current state of the field in this new area, which some have dubbed "contemplative science," and raise critical questions pertaining to this enterprise as well as to the scope of Buddhism-and-science dialogue in general.

WHAT DOES THE TIBETAN PARTICIPATION BRING TO THE BUDDHISM-AND-SCIENCE DIALOGUE?

The Dalai Lama often points out that Tibetan Buddhism sees itself as continuing the heritage of Indian Nalanda tradition. This classical tradition emphasizes the combination of rigorous *philosophical inquiry* (based on application of reason and argumentation as well as deep reflection on the interrelationship of concepts), *contemplative inquiry* into the phenomenology of the meditative states, and the embracing of *altruistic ethics* of the bodhisattva ideal. From a historical point of view, just as modern science brings to its understanding of the world the rich heritage of Greek rational thought, especially what was once called "natural philosophy," Tibetan Buddhism brings to its understanding the long history of ideas from within classical Buddhist thought, developed and refined over more than two thousand years.

Broadly characterized, Tibetan Buddhist thought can be seen as an integration of the following key elements of classical Indian Buddhism. In terms of its understanding of the mechanism underlying the origination and arising of things, it retains the early Buddhist prioritization of the law of causality, especially as defined in terms of *dependent origination*, as the fundamental principle. However, the Tibetan brings the meaning of this principle of dependent origination to the point where it moves beyond the

concept of unidirectional causal process to a deeply interconnected, mutually dependent network of events. This, in effect, is the nonessentialist ontology of Nagarjuna (second century C.E.), according to which no intrinsic existence or identity is accorded to anything, and where *truth* or *validity* is defined relatively within a given framework that includes our everyday conventions, especially language. Alongside this nonessentialist ontology, the Tibetan tradition embraces a sophisticated epistemology that began with the works of Dignaga and Dharmakirti in India, respectively in the sixth and the seventh century. This epistemological school contains a long history of sustained inquiry and debates pertaining to such key questions as the theory of knowledge, the validation of knowledge, the nature of perception, and the relationship of perception to the world. Given that in classical India development in epistemology went hand in hand with logic, which was perceived to be a key source of knowledge, the Tibetans inherited this logical tradition as well.

In addition to what may be roughly described as ontology, epistemology, and logic, the Tibetans also inherited and further developed the Buddhist Abhidharma system of thought. This aspect of the tradition can be characterized as the Buddhist equivalent of psychology and phenomenology. In contrast to the epistemological approach, the Abhidharma focus is on the phenomenology of the mental experience, including deep reflections on the contents of the various meditative states. A key aspect of the Abhidharma method is to analyze our mental states, both cognitive and affective, in terms of their specific characteristics, functions, and effects, as well as an attempt to reduce these mental states to ever more basic systems. This kind of inquiry gave rise to the development of a rich taxonomy of mental states (*caittas*, often translated as “mental factors”), which are organized according to certain thematic categories, such as omnipresent factors, determining factors, variable factors, and so on (Dreyfus and Thompson 2007). It is in this category, what I have characterized as psychology and phenomenology, that the rich tradition of Vajrayana thought and practice feature.

Finally, the Tibetan tradition embraces a powerful ethical system wherein compassion—a genuine aspiration for the alleviation of suffering of all beings—forms the foundation of all ethical values. It is this complex yet integrative tradition, which defies any modern categories of philosophy, religion and science, that is brought into a dialogue when, say, the Dalai Lama engages in a conversation with scientists.

The Nature and Scope of the Current Dialogue. The Dalai Lama’s personal enthusiasm for engaging with science has been instrumental in the renewed vitality we see in the conversation between Buddhism and science. The story of how the Dalai Lama came to be interested in science,

and how over the last several decades he had reflected deeply on how science intersects with his own inherited Buddhist worldview, is told beautifully in his recent work *The Universe in a Single Atom*. This quote from an early part of the book gives a flavor of his enthusiasm.

Although my own interest in science began with curiosity about a world, foreign to me at that time, governed by technology, it was not very long before the colossal significance of science for humanity as a whole dawned on me—especially after I came into exile in 1959. There is no area of human life today that is not touched by the effects of science and technology. Yet are we clear about the place of science in the totality of human life—what exactly it should do and by what it should be governed? (The Dalai Lama 2008, 9)

In even this short paragraph we see the powerful influence of the Dalai Lama's own inherited Buddhist worldview. First is the recognition of the observable effects of science on human life. This reflects powerfully the Buddhist emphasis on the primacy of empirical evidence. Second is the philosophical challenge posed to the scope and limits of scientific knowledge. The question is raised as to whether science is the only legitimate source of knowledge and thus the only constitutive element of our understanding of the world and human existence. Finally, there is the powerful question on the relation between science and ethics, which raises the question underlying the motivation of science and technology.

A careful observation of the Dalai Lama's dialogue with science reveals a creative and sophisticated methodology. One can discern two aspects to this. One is his dialogue with scientists on specific topics of mutual interest and concern, say, the understanding of human emotions or the epistemological challenges posed by new discoveries in quantum physics. The second is Buddhism's engagement with the scientific worldview, which may entail incorporation of specific scientific concepts into the Buddhist worldview as part of its updating of the understanding of the physical world. The Dalai Lama appears to see the second type of dialogue to be primarily relevant for the traditionally Buddhist societies as they move toward full encounter with modernity.

In the context of the first type of dialogue, there is the recognition of Buddhism and science as representing two investigative traditions in a quest to gain deeper understanding of reality. Here the project is a collaborative one, to help further human knowledge and seek ways to contribute to the betterment of the world. On this level, the key elements that are brought to bear in the dialogue, from both Buddhism and science, are those that lend themselves to empirical method and the theoretical aspects that are critical for the interpretation of the empirical data. On this level of dialogue, what I call the more metaphysical aspects of the two traditions—the concepts of rebirth, karma, and the possibility of full enlightenment of Buddhism; and physicalism, reductionism, and the causal enclosure principle on the part of the scientific worldview—are left bracketed.

These operating principles have been salient in the influential Mind and Life dialogues, which began in 1987 in India and have continued ever since. The series has brought scientists together in conversation with Buddhist thinkers, including the Dalai Lama. I have been an integral part of these dialogues from their inception, so, from an insider's perspective, let me comment on how the nature and scope of these dialogues are conceived and understood.

From the beginning, serious consideration has been given to ensure that the Mind and Life dialogues represent a forum where the two traditions, Buddhism and science, converse as equal partners, each with deep respect for the integrity of the other. As far as possible, this means that both sides must avoid any hegemonic tendency, especially the temptation to reduce the other into one's own framework. The scientists especially must avoid viewing Buddhism simply as an object of study (monks and adepts to be used as study subjects alone, for instance) with no respect for the Buddhist tradition's understanding of the phenomena they describe within the tradition's own conceptual and theoretical framework. Given that scientists generally are not philosophically trained, the Mind and Life dialogues always have given a critical presence to a philosopher whose role is to ask the metalevel questions—those pertaining to the distinction between empirical evidence, theoretical explanatory framework, regulative assumptions, and deeper metaphysical views. With these operating principles, the Mind and Life dialogues have so far covered a vast range of scientific topics, from quantum physics and astronomy to the question of brain plasticity and emotion research in neuroscience.

Challenges and Critical Engagement. Earlier I mentioned a second dimension to the Buddhism-and-science dialogue, in which the engagement is relevant principally to the traditional Buddhist societies. The objective here is twofold: to incorporate those elements of the scientific worldview that are essential, for which there are sound empirical bases, into the Buddhist worldview, and to respond to the perceived challenges being posed by the scientific worldview to key Buddhist concepts.

The first objective is primarily educational in that the concern is to update the classical Buddhist understanding of the physical world. For example, in the light of current understandings in physics, the classical Buddhist theories about the material structure and constitution of the natural world—the atomic model and so forth—require serious modification. Although historical research shows that defense of Buddhist Abhidharma cosmology figured prominently in the science-and-Buddhism dialogue in the early twentieth century, the Tibetan tradition, at least the Dalai Lama, seems to have debunked the entire edifice of this traditional cosmology. Similarly, the narrative pertaining to the origin of human life on earth, which is found in traditional sources, is being replaced by the Darwinian

theory of evolution. The underlying principle here is simply this: Where there are empirical accounts, whether they have to do with cosmology, the understanding of matter at the subatomic level, or the evolution of complex life forms, whatever empirical evidence supports takes precedence. This spirit is captured beautifully in the following by the Dalai Lama:

The insights of science have enriched many aspects of my own Buddhist worldview. Einstein's theory of relativity, with its vivid thought experiments, has given an empirically tested texture to my grasp of Nagarjuna's theory of the relativity of time. The extraordinarily detailed picture of the behavior of subatomic particles at the minutest levels imaginable brings home the Buddha's teaching on the dynamically transient nature of all things. The discovery of the genome all of us share throws into sharp relief the Buddhist view of the fundamental equality of all human beings. (The Dalai Lama 2008, 206)

The other objective in this critical engagement with science has to do with responding to the perceived challenges being posed by the scientific worldview to key Buddhist concepts. What is the status of the concept of rebirth? What does the closure principle, which states that the only causes that operate are material, imply for the Buddhist theory of karmic causation? How does Buddhism respond to the widely assumed regulative principle in cognitive science that mind equals brain and that all mental states are, in the final analysis, merely brain states?

It is worth recalling here an important aspect of the history of the development of Buddhist thought in classical India. Most of the high points in its development, whether Nagarjuna's philosophy of emptiness in the second century C.E. or Dharmakirti's epistemology in the seventh century, took place within the context of critical engagement with other systems of thought. Debate and refinement of views in the wake of criticism have been an integral part of the dynamics of idea development in Buddhist thought, such that, even today, courses in comparative philosophy—those of classical India—remain part of the regular curriculum in Tibetan monastic colleges. It is primarily in this spirit that the Tibetan monastic scholars tend to relate to science. Scientists who engage with Tibetan scholars notice how questions immediately turn to the theoretical and philosophical implications of specific scientific views rather than focusing on the details of the content of a particular concept. They notice also how, on the whole, it is physics, especially quantum physics and the epistemological challenges it poses, that immediately captures the attention of the monk scholars.

In this area of critical engagement, primarily at the level of worldview, Tibetan thought brings a set of powerful methodological and epistemological approaches. A central element of its epistemology is the recognition of three primary sources of knowledge: direct experience, inference, and third-person testimony. These three correlate to what the tradition perceives to be three types of facts in the world: *evident* facts, hidden but

inferable facts, and *extremely hidden* facts. So there is the recognition that not all facts lend themselves to direct empirical proof; however, it is on the basis of the empirical facts that one's understanding of the world derived from inference must be built. Thus, of the three sources of knowledge, direct experience takes precedence.

In addition to the epistemological principles, what one might call logical principles play a crucial role. For example, the Dalai Lama often invokes a critical logical distinction between *that which is not proven* and *that which is proven not to be the case*. In other words, not finding is not the same as finding its absence. In order for there to be a coincidence between nonobservance and observance of its absence, the facts under investigation must belong to the category of evident truths, such as the presence of a bear in this room. In brief, what the Buddhist tradition does here is first of all ask questions. "What type of fact is being asserted in a specific scientific claim? Is this a claim about an evident fact, or is it a claim pertaining to an inference based on an evident fact? Or is it an assertion that is part of the explanatory theoretical system? Or is it an assertion that assumes a certain regulative principle, which is itself not proven? Or is the claim really part of a wider worldview that assumes, among other things, standpoints of reductionism, physicalism, and so on?" The Dalai Lama is famous for having made the statement that if science proves any aspect of the Buddhist views wrong, regardless of how long we might have upheld it, we must abandon it. Although this is true, such a statement must be appreciated with the background of such developed epistemology and logical tradition.

In reviewing the ongoing encounter between Buddhism and science, it is useful to invoke a distinction Jose Cabezon has made between three distinct ways in which the Buddhists have conceived the nature of the relationship between Buddhism and science. He calls them (1) conflict/ambivalence, (2) compatibility/identity, and (3) complementarity (Cabezon 2003). The first approach involves viewing the relationship as that of a rivalry and adopting a profound skepticism as a default standpoint wherein no benefit of a dialogue is seen at all. The second approach adopts the extreme opposite stand in which a kind of identity is assumed between Buddhism and science—that is, the idea that Buddhism is a kind of science and that many of key scientific insights were already discovered and understood by Buddhists long before the advent of modern science. The approach of complementarity is somewhere between these two positions.

Arena for Concrete Collaboration. From the wider societal point of view, perhaps the most fruitful aspect of the ongoing dialogue between Buddhism and science has been the genuine collaboration between scientists and Buddhist contemplative scholars in some practical domains. A field is emerging that often is referred to as "contemplative science" or the "science of meditation." At this stage it is not clear whether such a field

will have any lasting impact on science as a whole. On the part of science, participants in this new field include neuroscientists, psychologists, and clinical researchers. Neuroscientists and psychologists are interested in engaging with Buddhist Abhidharma psychology and phenomenology as well as Buddhist contemplative practices to see if research methods and the theoretical framework on the study of the human mind can be enriched through serious engagement with Buddhist thought. Clinical researchers are principally interested in testing the effects of specific contemplative practices, such as mindfulness, loving-kindness, and compassion cultivation, in health-related outcome measures. There is also the more basic question of whether through experiments on Buddhist adepts science can learn more about the potential and the capacity of the human mind. Today, several pioneering experiments and collaborative studies are underway in various universities, especially in the United States.

On the methodological side, some scientists and philosophers of science are exploring the possibility of bringing introspection back into psychology. The understanding is that unless we introduce some form of first-person approach we will have no handle on capturing the subjective, first-person nature of our experience of consciousness, which is its defining characteristic. With integration of contemplative methods developed and refined in Buddhism, it is hoped, a way can be found to employ a more reliable and trained form of introspection. Only time will tell how this incorporation may pan out. One possibly fruitful area of research, as yet to be explored, is a rigorous work on the Buddhist Abhidharma taxonomy of mental states, in which each of these distinct mental states is defined, with its characteristics and effects identified.

THE POSSIBLE IMPACT ON SCIENCE FROM THIS ENCOUNTER

Whenever there is a serious encounter between two cultures, both sides are transformed. In what ways might science, and more specifically the scientific worldview, change through its encounter with Buddhism?

There is the obvious case of individual scientists personally undergoing change as a result of encounter with Buddhism, especially through such a powerful representative as the Dalai Lama. One can clearly discern the major impact on the current work of noted emotion scientist Paul Ekman in light of his engagement with Buddhist thought; his recent book *Emotional Awareness* (2008) is based on a series of conversations on the points of convergence between Buddhist and modern scientific understanding of emotion and its potential for regulation. The influential neuroscientist Richard Davidson has established a center for Investigating Healthy Minds at the University of Wisconsin, Madison. On the level of philosophy of science, we see perhaps the most interesting work being done by Owen Flanagan of Duke University (2007), Evan Thompson of York University,

Toronto (Varela, Thompson, and Rosch 1991), and Michel Bitbol at Centre de Recherche en Epistemologie Appliquee (CREA), Paris. All of these individuals have participated in direct conversations with the Dalai Lama and were able to see not only the intellectual rigor that the Buddhist tradition brings to the table but also, and perhaps more important, the genuine openness to critical engagement in a conversation that could enrich both sides.

A more interesting and difficult question is how science as a culture might change through this interaction. For once, science is encountering an intellectual tradition that traces its lineage back to more than two thousand years of inquiry yet has a history very different from the West. In this tradition, no dichotomous separation between philosophy, religion, and science has occurred. It is a tradition that shuns reductionism and emphasizes an integrated understanding of the world and human existence wherein ontology, epistemology, and ethics are interconnected. As the Dalai Lama puts it, “a full human understanding must not only offer a coherent account of reality, our means of apprehending it, and the place of consciousness but also include clear awareness of how we should act” (2008, 206).

One area where science’s encounter with Buddhism could have a lasting effect is our understanding of the scope and limits of scientific knowledge. Another arena where the impact could be felt would be in the ongoing debate on the connection between science and ethics. With the appearance of Buddhism on the block, science has the chance to critically engage with an intellectual tradition that has a robust understanding of ethics that is not contingent upon any notion of a transcendent, divine law. The fundamental principle, if there is one in Buddhism, is the imperative of compassion—a genuine wish to alleviate suffering in all beings. This approach to ethics that places compassion at the heart of ethical discernment constantly challenges science to be mindful of its motivation as well as the wider implications as it opens up a whole new area of human knowledge.

In conclusion, although I take heed of Lopez’s warning about the potential danger of a progressive shrinking of “the Buddha’s Aura,” whereby the Buddha may come to be reduced to simply being a “good man” (Lopez 2009, 216), I am much more optimistic. My feeling is that in the long run, the impact of this dialogue is likely to be constructive for both sides. For Buddhism, the encounter will help update its worldview so that its understanding of the human condition is firmly rooted in a robust understanding of the physical world, and for the scientific worldview the encounter may bring a much needed humanizing influence.

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