A few years ago, the Dalai Lama published a short book on Buddhism and modern science. Entitled *The Universe in a Single Atom: The Convergence of Science and Spirituality*, the Dalai Lama ranged from the Big Bang to the smallest atom, from evolution to biomedical ethics, giving his Buddhist perspective on various scientific issues. This is the Dalai Lama’s first
book that is wholly dedicated to modern science as whole, but the title may be a bit misleading. The “convergence” of science and spirituality does not refer to realized, unqualified, and absolute agreement between Buddhist spirituality and modern science. Instead, the Dalai Lama proposes various ways that science and Buddhism might enter into a dialogue fruitful for both fields. Perhaps the most interesting proposal relates to cosmological and biological evolution. The Dalai Lama offers a way of thinking Buddhistically about evolution that invokes both material (or physico-energetic) realities as well as non-material realities. Such a model would be of interest to those engaged in Buddhist-Christian dialogue.

The Fourteenth Dalai Lama has been interested in science and technology at least since his teen-age years in Lhasa.¹ Technology was his first love, his interest piqued by various mechanical assemblages acquired by the previous Dalai Lama, including a telescope, a pocket watch, film projectors and three automobiles. However, it was not until his journeys to Beijing in 1954, to India in 1956, and his forced exile from Tibet in 1959 that the Dalai Lama encountered the majestic accomplishments of modern technology, including modern farming, hydroelectric dams, and industrial factories. In India, he also met Theosophists, who were trying to integrate modern science with ancient spiritual culture. These journeys confirmed what he had earlier suspected, that the technological marvels of the modern world were a result of the methods of science, and that it was science, rather than technology itself, that was the genius of modern Western culture.

After his forced exile from Tibet, the Dalai Lama had many more opportunities to learn what the essence of science was all about. His tutors in science included some of the elite scientists of the twentieth-century, including the German physicist Carl von Weizsäcker (who himself had earlier worked with the physicist Werner Heisenberg) and the American physicist David Bohm.² From scientists such as these, the Dalai Lama learned that science was primarily a

¹ The Dalai Lama discusses his early interest in, and encounters with, modern technology and modern science, in his *The Universe in a Single Atom: The Convergence of Science and Spirituality* (New York: Broadway Books, 2005), 17-23.
² The Dalai Lama, *Universe*, 27-37, reveals the wide exposure the Dalai Lama had in learning about modern Western science, traveling to America, Europe, and the Soviet Union. Even though some of the scientists he met were rather hostile to anything religious or spiritual, some were not; neuroscientist Francisco Varela and
method. The method involved making an initial set of observations about the material world of the five senses. Then, a hypothesis, or “theoretical generalization,” was formulated in order to explain the observations. Next, the implications of the hypothesis were deduced, and those implications were tested (via experimentation, e.g.). If the implications of the hypothesis could be measured empirically, then the hypothesis was confirmed; if not, then it was concluded that that particular hypothesis did not accurately explain the observations. If other scientists could consistently confirm the hypothesis, then the hypothesis was considered increasingly strong.

The Dalai Lama soon became aware of the similarities between scientific methods and Buddhist practices. A few of these similarities should be briefly noted. Science includes the use of rational thought. Science, moreover, emphasizes sense-based experience. Both of these factors are also important in Buddhism. Rational thought, or rationality, can be defined in many different ways, but in a scientific context, rationality can be defined as a particular way of thinking that assumes the existence, and then searches for, “reasons” or causes for various sense-based experiences in the world. To act “rationally” is to act on the basis of knowing that one’s acts are “causes” that will have specific effects. To think “rationally” is to know that whatever exists, has a “reason” or cause for existing. Modern science is based on the idea that there are knowable reasons, or causes, that help to produce what we find in the cosmos, in nature, in the human mind. Whatever your five-senses are able to experience, say a cloud, or a flower, that thing has a cause, and to practice science is to be open to finding out what that cause is, without presuming beforehand what that cause might be. Likewise, Buddhism’s Four Noble Truths discuss, in a rational way, the causes of duhkha, or “suffering”. Suffering exists, yes, which also means that suffering has a cause. Buddhism’s purpose is to find that cause, and dissolve it, or transform it, so that suffering itself dissolves or transforms. Thus, Buddhism’s approach to suffering may be described as “rational,” and the suffering itself is something that anyone can experience with his or her senses.

businessperson Adam Engle organized the Mind and Life conferences, a forum in which the Dalai Lama was able to share ideas with scientists who appreciated the wisdom found in the spiritual traditions.
While both Buddhism and science give value to reason and what is experienced via the senses, there are some differences. The Dalai Lama contrasts Buddhism and science by pointing to the authority that scripture possesses in Buddhism.³ What this means is that, in Buddhism, if one refers to a statement found within Buddhist scripture, then that statement would have significant value, and could not be easily dismissed. However, the Dalai Lama carefully notes that “strictly speaking, in Buddhism scriptural authority cannot outweigh an understanding based on reason and experience.”⁴ He refers to an oft-quoted statement of the Buddha, in which he advises his followers not to simply believe what he claims to be true, but to test his claims in the laboratory of their own minds and bodies, just as a goldsmith would test the purity of a weight of gold. What this implies, says the Dalai Lama, is that if certain scriptural sources state that certain realities exist, and if one’s own tested experience results in the conclusion that those realities in fact do not exist, then one is bound, in following the teaching of the Buddha, to reject those realities that scripture claims to exist. So, while scripture is very important in Buddhism, it does not have ultimate importance. What is ultimately important is one’s own experience, tested by reason.

What the Dalai Lama is suggesting, is that Buddhist scriptures are, like scientific texts, open to re-thinking. The Dalai Lama argues that even the most venerable scripture should not be immune to new scientific information. The Buddhist texts that are most susceptible to new scientific information are texts that describe the structure of the cosmos. There are many different Buddhist cosmologies, and they vary in their compatibility with modern science. One particularly cogent Buddhist cosmology discussed by the Dalai Lama is the Abhidharma cosmology, which “describes a flat earth, around which celestial bodies like the sun and moon revolve.”⁵ If scientific observations and experimentation have shown that the earth is a spheroid object that orbits around the sun in an elliptical trajectory, then sacred texts that speak of the earth as immovable and of the sun as moving around the earth, must be re-evaluated. In the case

³ The Dalai Lama, *Universe*, 24-25, 28-29.
⁵ The Dalai Lama, *Universe*, 79.
of the earth’s orbit, the conclusions from science are particularly important because the earth and
the sun are material objects that can be observed with the five senses, aided by scientific
instruments.

Going from the realm of the cosmic to the realm of the atomic, the Dalai Lama
acknowledges that certain Buddhist ideas of how atoms (the supposed smallest units of matter)
are structured are not as well-developed or as sophisticated as the atomic theories of modern
science. He goes further and suggests that Buddhist physics should be altered in light of the firm
conclusions of modern physics:

In any case, my own feeling is that this aspect of Buddhist thought, which is essentially a
form of speculative, rudimentary physics, must now be modified in light of modern
physics’ detailed and experimentally verified understanding of the basic constituents of
matter in terms of particles such as electrons revolving around a nucleus of protons and
neutrons. When one listens to descriptions of subatomic particles, such as quarks and
leptons, in modern physics, it is evident that the early Buddhist atomic theories and their
conception of the smallest indivisible particles of matter are at best crude models.6

Some of these Buddhist atomic theories are traditionally attributed to the Buddha, so the Dalai
Lama may be arguing here that the lack of scientific accuracy is due to the Buddha’s main goal
of ending suffering, rather than revealing empirical reality for its own sake.

However, there are limits to the power of science to critique Buddhist dharma. For the
Dalai Lama, modern science can critique Buddhist claims about the material realm, the realm of
matter and energy, but not the non-material realm – the realm of the inner, subjective
experiences of images, feelings, and awareness. If one were to claim scientific reasons for
rejecting the possibility of the Buddhist idea of rebirth (or reincarnation), by pointing to the fact
that most people do not claim memories of a past-life, or to psychological evidence of the mind’s
dependence upon the physical organ called the brain, then, the Dalai Lama argues, one has
entered into an realm that scientific method and instruments cannot competently study.7 If
Buddhist scriptures describe material realities that are not literally true, then that fact should be
acknowledged. Thus, when it comes to non-material realities (like ideas, thoughts, and

6 The Dalai Lama, Universe, 55.
7 However, if science reveals other, valid reasons for rejecting rebirth, then Buddhism should listen, the Dalai Lama
admits.
consciousness), scientific claims about such realities, though accurate in some ways, do not and cannot fully describe what those realities are. The Dalai Lama argues that the particular forms of reason and experience that modern science values places a limit on the domain of scientific authority:

“Science deals with that aspect of reality and human experience that lends itself to a particular method of inquiry susceptible to empirical observation, quantification and measurement, repeatability, and intersubjective verification – more than one person has to be able to say, ‘Yes, I saw the same thing. I got the same results.’ So legitimate scientific study is limited to the physical world, including the human body, astronomical bodies, measurable energy, and how structures work.”

Modern science can determine which regions of the brain are active during certain mental activities, but such data in themselves are not descriptive of what the subject itself unmediatedly experiences.

The Dalai Lama rejects the idea that modern science holds the last word on non-material realities. This rejection is due to his accurate understanding that the method of modern science is based on a presumption: the presumption that material reality is the foundation of all reality, including thoughts, ideas, feelings, and consciousness. Material reality is thought to include all forms of matter, all the way down to molecules, atoms, and sub-atomic particles like electrons and quarks; as well as all forms of energy, like photons; and from this reality is produced what we call “mind.” In other words, the method of modern science presumes “materialism” (also known as “naturalism” or “physicalism”). I do not want to denigrate this presumption, because this presumption has certainly been a very powerful method for discovering the material and physical processes of the cosmos. To presume the foundational status of matter, for the purpose of unveiling how the cosmos works, is called “methodological materialism” or “methodological naturalism.” The Dalai Lama praises this approach, and encourages it, as a way of finding out about material realities.

However, it is possible to make a move from methodological naturalism, in which one simply presumes that matter is the foundation of reality for the specific purpose of discovering

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how the physical world works; and move towards believing that matter is truly and really the foundation of reality. One then moves towards what is called “ontological materialism” or “ontological naturalism”; the Dalai Lama calls this “scientific materialism.” Ontological naturalism states that the assumption of naturalism is not simply a method (that can be adopted in the morning and jettisoned at sun-down). Naturalism describes how things actually are, in their totality. Not only should scientists try to explain the physical world by invoking purely physical processes, but reality itself is solely founded on physical and material entities and forces. Many scientists, though practicing methodological naturalism in the context of their laboratories, do not adopt ontological naturalism as part of their philosophical world-view. And, of course, many scientists do adopt both methodological and ontological naturalism.

The Dalai Lama suggests that the Darwinian model of evolution cannot explain everything about evolution, because the Darwinian model excludes non-material realities. This is where the Dalai Lama shows how Buddhism can offer a critique of a science based solely on materialism. The Dalai Lama’s critique begins with the observation that according to current biological consensus, genetic mutations appear in a random, unpredictable manner. The Dalai Lama writes that the idea that the appearances of mutation “are purely random strikes me as unsatisfying. It leaves open the question of whether this randomness is best understood as an objective feature of reality or better understood as indicating some kind of hidden causality.”

The Dalai Lama would agree with many Christians on this point: that mutations may be random from a methodologically naturalistic scientific perspective, but not necessarily random from a non-naturalist perspective.

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9 The ultimate inadequacy of any ontologically materialist hypothesis or theory could, thus, also be deduced from a starting point of ontological non-naturalism.
10 The Dalai Lama, *Universe*, 104. The Dalai Lama opens himself up to being critiqued as supporting a Buddhist version of the “God-of-the-Gaps” perspective: that because there is a gap in our knowledge of how something works, then there must be a non-natural explanation that must be invoked in order to explain how that something works. The question of the “God-of-the-Gaps,” though, must include consideration regarding the nature of the “gap” in question: is it a gap that science can, if given enough time, fill; or is the gap a permanent lacuna in human knowledge?
Many Christians hold to theistic evolution.\textsuperscript{11} Theistic evolution posits that evolution happens, and mutations occur, but God is somehow guiding the evolutionary process, perhaps pushing evolution in a broad direction of greater complexity, or perhaps attracting life towards greater levels of divine enjoyment. Christian theistic evolution would add that Christ plays a key role in the evolutionary process. Theistic evolution would suggest that mutations, though appearing apparently at random, may in fact not be as random as we might think. Theistic evolution is seen as a way of recognizing the validity of modern science, without denying that non-material realities – in this case, the non-material reality is God – exist and may actually influence material realities.

The Dalai Lama, being Buddhist, would not speak of “God” as the non-material reality behind the evolutionary process. Instead, the Dalai Lama speaks of the action of consciousness, specifically, \textit{karma}. The Dalai Lama, starting from the Buddhist idea of \textit{karma}, suggests that a Buddhist interpretation of evolution would be based the idea of \textit{karma}. \textit{Karma} in Buddhism means intention or action, while \textit{vipaka} means the result that springs from that intention or action. Sentient beings – beings that can sense pain and pleasure – possess the common intention of wanting to be free from pain and to enjoy pleasure. Since in Buddhism sentient beings (as well as non-sentient beings) have always existed, the forces of \textit{karma}, of intentional actions, have always been acting on material bodies, possibly even shaping the direction of evolution. \textit{Karma} might then play a very natural role in shaping the kinds of mutations that occur within the cells of living organisms, possibly providing a direction or several possible directions toward which any particular life-form is evolving. The Dalai Lama writes that “this karmic causality is seen as a fundamental natural process and not as any kind of divine mechanism or working out of a preordained design.”\textsuperscript{12} By rejecting the idea that \textit{karma} is “divine,” the Dalai Lama, I suggest, is trying to show that \textit{karma} is very much a part of the world of change and


\textsuperscript{12} The Dalai Lama, \textit{Universe}, 109.
impermanence, rather than being something unchanging and static.\textsuperscript{13} Thus, instead of theistic evolution, the Dalai Lama proposes what may be called “karmic evolution” – even though the Dalai Lama doesn’t specifically use that phrase.

Besides being one of the few written accounts in English, from a widely recognized Buddhist authority, of a Buddhist model of “karmic evolution,” the Dalai Lama’s text offers a way of thinking about Buddhist-Christian dialogue and, ultimately, about the science-and-religion dialogue. Even given the differences between Buddhism and Christianity, both religions share some common positions. Both theistic evolution and “karmic evolution” show the common ground that both Christians and Buddhists share: the idea that non-material realities can not ultimately be ignored, if one’s goal is a truly comprehensively “scientific” approach to understanding the cosmos. This does not mean that contemporary science should be forced to invoke non-material explanations of the physical world, because methodological naturalism works extraordinarily well in its limited arena. What this does mean is that if science is defined as ontological naturalism, then the conflict between science and religion will never be resolved.

\textsuperscript{13} Process theology is a theistic philosophy that shares similarities with Buddhist ways of thinking. Process theology, unlike many traditional theologies, emphasizes that God, instead of being eternally unchanging, is deeply involved in the process of evolving, and helping the universe evolve along with Him. See, for instance, John B. Cobb, Jr., and David Ray Griffin, \textit{Process Theology: An Introductory Exposition} (Louisville, Kentucky: Westminster John Knox Press, 1976).