Tibetan Monastics Reflect on Science and Buddhism: (I) The Basic Human Nature and (II) Subatomic Particles

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One of the goals of the historic Emory-Tibet Science Initiative (ETSI) is to catalyze cross-cultural thinking among scientists and Buddhists. Over a decade into the project to elicit such thinking the project sponsored an essay competition among the monastics. Here we feature two of the winners reflecting on different aspects of western sciences and Buddhism, physics and Buddhism respectively, demonstrating how modern science is integrating with the monastics’ traditional training and culture. A key aspect of ETSI is also translation, and these essays, in that spirit were translated from Tibetan to English by one of the project translators.

Keywords: human nature, compassion, buddhist philosophy, modern sciences, subatomic particles, atoms, elementary particles, quarks

INTRODUCTION

Since its inception in 2006, the Emory-Tibet Science Initiative (ETSI) has introduced modern sciences to thousands of Tibetan monastics through well planned programs. Now moving into its sustainability phase, ETSI focuses on training indigenous science teachers and researchers through pedagogy and research workshops. To not only diversify and enrich scientific literatures in the Tibetan language, but also to catalyze cross-cultural thinking, the program has recently sponsored an essay competition among its participants, and two of the winning essays were selected and translated into English by one of the ETSI translators. While the first essay compares and contrast Buddhist views with western understandings on the basic human nature, the second essay reflects on subatomic particles from Buddhist accounts and scientific discoveries.

BASIC HUMAN NATURE

Introduction

The question of basic human nature has been the most important topic of debate and investigation for many centuries among philosophers, founders of religions, and scientists, because the goal of all people is to seek happiness and avoid suffering. The methods to attain this ultimate goal exclusively depend on how humans recognize their own nature. His Holiness the Dalai Lama said, “As a matter of observation, how people treat their fellow human beings, and indeed the world around them, largely depends on how they perceive themselves. We all have many different ways of seeing “who we are,” and these different views influence our behavior” (Lama, 2016).

Since the start of the Age of Enlightenment in the west, and specifically the formulation of Darwin’s Theory of Evolution, one of the popular views considered basic human nature as selfish and...
However, current life sciences and primatology research show that basic human nature is compassionate. Moreover, His Holiness has said “it is especially happy and encouraging because basic human nature is compassionate” (Lama, 1998). Therefore, in this essay I will explore how Buddhism, western religions, philosophy, and science identify basic human nature, and will investigate how Buddhists examine western views. In this context, basic human nature means the innate character of a human being.

**Western Views and Buddhist Thoughts on These Views**

**Christian View**

According to Christianity, Adam and Eve were created by God in the image of God (Genesis, 1980) and given the wisdom to distinguish good from bad, however, they ate the forbidden apples and in doing so stained their pure nature. “Even today, there are Christians and Jews who believe that human nature is bad and to escape it one needs to become a follower of God or Christianity” (Wallace, 2009).

Well-known Tibetan religious philosopher Tsongkhapa (1357–1419) said, “The world of sentient beings is due to the karma and afflictions accumulated by the mind. Different physical worlds arise due to the specific karma accumulated by the mind of those sentient beings” (Tsongkhapa, 2015). Therefore, Buddhists do not accept the concept of God or a Creator but believe that all sentient beings arise in a variety of forms due to their karma accumulated over many lives. One unique notion of Buddhist karmic view is that one will not undergo consequences of an unaccumulated karma, and an accumulated karma will not be wasted (Samdhong, 2020). Therefore, if all human beings became sinful because of Adam’s action, it would contradict the Buddhist view of karma that posits humans face the karmic result of their own action.

**Western Philosophical View**

Innate knowledge has been a main point of argument between rationalists and empiricists (Messerly, 2014). Rationalists claim some concepts are innate while empiricists believe all concepts depend on actual experiences. As a rationalist, Descartes believed that true knowledge of examining an object arises through mental perception, where senses deceive and are deceptive. Consequently, he claimed to doubt all beliefs, as all beliefs are acquired from the senses (Monette, 2018). Prof. Jay Garfield mentions Descartes’ view in *Western Idealism and Its Critics* where he says, “human nature is capable of thinking” (Garfield, 1998).

Empiricists like Aristotle and John Locke believed that human nature is formed through one’s environment and experience, and that the mind at birth is like a *tabula rasa*, neither good nor bad, and incapable of perceptual judgement. John Locke attacked Descartes’ idea by stating that if humans have innate nature, all should have the same innate nature (Pinke, 2016).

The western philosophical view accepts the concept of innate nature and is more closely aligned with Buddhism. In *Commentary on Valid Cognition*, 6th century Indian Buddhist philosopher Dharmakirti said “a non-consciousness cannot be the substantial cause of consciousness” (Dharmakirti, 2004). As this indicates, the consciousness of a newborn should arise from a previous consciousness as its substantial cause. As a dualist, Plato believed in the separate existence of material body and immaterial mind, the reasoner being the self, and the self existing before birth and after death (Messerly, 2014).

Rationalists postulate that knowledge must be composed of conceptual thought, whereas empiricists assert that every knowledge arises from sensorial perception. From Buddhist epistemology, both of these perspectives amount to nihilism. In Buddhism, an object of knowledge is necessarily either particulars such as a yellow cup or universals such as a cup (Encyclopedia, 2021). Therefore, knowledge is certain to be either inferential or perceptual as captured in Pramanavarttika (*Commentary on Epistemology*), “because there are two objects, there are two knowledge” (Dharmakirti, 2004).

**Scientific Views**

In the mid 19th century, Charles Darwin published his thoughts on the origin of life and the theory of evolution. After reading Darwin’s *Origin of Species*, English political philosopher Herbert Spencer invented Social Darwinism. This ideology describes humans as competitive in nature, and the stronger the species, the greater their chance of survival and reproduction (Falk, 2020). Primatologist Frans De Waal said, “If strong varieties progress at the expense of inferior ones, this was not only how it was, Spencer felt, but how it ought to be. Competition was good, it was natural, and society as a whole benefited” (De Waal, 2009). Social Darwinists believe in survival of the fittest, and consider that some types of people naturally become powerful because they are innately better. Social Darwinism has been used to justify imperialism, racism, eugenics, and social inequality (History, 2018).

Gregor Mendel discovered genetics and inheritance after doing experiments on differently colored peas; concepts later used as a basis for eugenics. In *The Selfish Gene*, Richard Dawkins said, “the dominant features in successfully living genes are selfish and violent. This selfish gene makes the person selfish” (Dawkins, 2016). In the 18th century, when Social Darwinism was spreading in the west, Francis Galton started a new science to improve the human race by eradicating “undesirable genes.” Adolf Hitler, one of the world’s most notorious eugenicists, implemented Nazi-centered eugenic policies which considered Jews, Roma, Poles, Soviets, people with disabilities, and homosexuals inferior, and provided justification for the taking of innocent lives (History, 2018).

“Many neuroscientists have come to the conclusion that the mind is really the brain, or the mind is what the brain does. They claim that all our personal experience consists of brain functions, influenced by the rest of the body, DNA, diet, behavior, and environment” (Wallace, 2009). Neuroscience unveiled evidence for rationalists’ claim of innate nature. For example, the Blue Brain Project (Pousaz, 2011) has proven that neurons send signals independent of personal experience. Neuroscientists estimate clusters of about fifty neurons are found in the brain at birth, and are fundamental to innate knowledge of simple
workings of the physical world, acquired knowledge, and memory. Markram notes, “This could explain why we all share similar perceptions of physical reality, while our memories reflect our individual experience” (Pousaz, 2011).

In recent years, in the field of primatology, neuroscience, and life science, some studies have shown that compassion is not only innate to human nature, but also essential to human survival (Seppala, 2013). Mindfulness Based Stress Reduction is widely practiced, and has significant success in reducing stress. Furthermore, neuroscience research has shown that meditation on compassion yields greater benefit than mindfulness practices (Goleman and Davidson, 2017).

Modern sciences such as evolutionary biology, genetics, and neuroscience, unanimously identify and explain human nature by genetics. Biologist Edward Wilson said, “We are biological and our souls cannot fly free. If humankind evolved by Darwinian natural selection, genetic chance and environmental necessity, not God, made the species” (Wilson, 2004). Defining human behaviors based on genetics, and considering parental genes as the substantial cause of consciousness completely contradicts Buddhist views. Firstly, according to Buddhism, things arise from their substantial cause with the help of cooperative conditions. An object and its substantial cause must share similar properties, therefore genes cannot be the substantial cause of consciousness. Secondly, if parental genes determine a child’s health and mental condition, then it would contradict the karmic law by allowing unaccumulated karma to come to fruition and accumulated karma to go to waste.

**Buddhist Views**

Even though Buddhism does not specifically mention human nature, it considers all sentient beings with different levels of intelligence to equally have a Buddha nature and consciousness to be clear and knowing. His Holiness has said, “According to Buddhist psychology, consciousness in itself is neutral. It’s neither wholesome nor unwholesome, neither positive nor negative. Of course, it has the potential to be both, one way or the other” (Lama, 2002). All sentient beings have potential to acquire all the virtues of wisdom and compassion of a fully awakened Buddha. The first step of mind training in altruism, based on the seven-part cause-and-effect quintessential instructions for cultivating bodhicitta, is to recognize all sentient beings as having been one’s mother, as love towards one’s mother is innate (Lama, 2019).

The first of His Holiness’ four commitments focuses on the promotion of human values such as compassion, a part of basic human nature, without depending on religious explanations. His Holiness says, “My own view is very much based on empirical observation of how human life begins, how we depend so much on others’ affection throughout our lives, especially at particular points, and how we respond to affection both biologically and psychologically” (Lama, 2002). Since humans are social animals, compassionate care is essential and scientifically proven for their survival, especially a mother’s compassionate care for a newborn. Buddha mentioned that the possession of one dharma that equates to the possession of all dharmas is great compassion (Kamalasila and Vimalamitra, 1977). In Buddhism, compassion is the aspiration to alleviate suffering. In a sutra, Buddha said, “great compassion is the liberator of all sentient beings from all suffering” (Buddha, 2006).

**Conclusion**

Although creating a happy society is everyone’s wish, as 8th century Indian Buddhist scholar Shantideva mentions, “Although everyone wishes for happiness, due to ignorance, one destroys one’s happiness like an enemy” (Shantideva, 2008), meaning we acquire more suffering than happiness because we concentrate more on material richness than inner wellbeing. Ultimately, the solution is to nurture virtuous qualities such as love and compassion by developing an educational system founded on compassion reflective of scientific evidence. This will ensure that new generations will live happily. His Holiness has said, “If we think of our nature as essentially compassionate and cooperative rather than violent and competitive, we will tend to behave in certain ways” (Lama, 2002).

**SUBATOMIC PARTICLES**

**Introduction**

According to Buddhist philosophy, a subatomic particle is the smallest entity of physical form. Modern science states subatomic particles refer to elementary particles and subtler quarks. This essay focuses on the following questions. In Buddhism: How do subatomic particles exist? Are there differences between composite and elementary particles? What is the deeper philosophical basis for either advocating or rejecting the idea of a partless subatomic particle? What is the definition of matter? Is there a particle that is not any of the fundamental properties of earth, water, air, and fire, or their derivatives? In science: Do all particles consist of protons and electrons? What are the characteristics of an atom? Is there a substance before its experimental confirmation? In both Buddhism and science: Are the notions of matter “with parts” the same? Are the purposes of positing subatomic particles the same? Are there differences in understanding the formation of atoms? Are there ways to define a thing without relying on its parts? What are their views on the formation of gross level materials from atoms, and atoms from subatomic particles?

**Buddhist and Scientific Views, and Their Comparisons**

“Both Buddhism and science share methodological similarities, including a commitment to testing hypotheses about the nature of reality by repeated experiment” (Halliwell, 2009). Buddhist philosophy considers that both compounded or impermanent phenomena which are produced from causes and uncompounded or permanent phenomena which are not produced from causes are to be investigated (Hopkins, 2007). Science investigates all tangible things that one can see, hear, smell, feel, and touch, and the interactions of mass, energy, and forces. Investigation has been a main part of acquiring knowledge.
in both traditions. Buddha said, “Bhikshus and the wise, just as a goldsmith tests his gold by burning, cutting, and rubbing, so you must examine my words and only then accept them, not merely out of reverence.” “The goal of science is to investigate and explain objects by using a unique inquiry method,” and Carl Sagan said, “science is not only a treasure of knowledge, but also a way of thinking” (Biaji and Lodoe, 2014).

Though scientific findings are the result of vigorous experimental processes, they are not guaranteed to be free of falsehood as rejection of a theory is also possible. In Buddhism something to be established as unquestionably existent must fulfill all three essential points: registered by a conventional consciousness; not contradicted by other conventional valid cognition; and not contradicted by a consciousness analyzing ultimate nature or whether anything exists by way of its inherent nature (Ngam, 2014).

All Buddhist philosophies accept ultimate truth and conventional truth. The building blocks of matter in the universe, i.e. the subatomic particles, belong to conventional truth. Identical or different types of subatomic particles come together to form matter. The subatomic particles are formed by earth, water, fire, wind, and their four derivatives, i.e. form, smell, taste, and tactility (Tan, 2009). All eight material particles are needed to form matter. For example, a cup of milk tea has particles with the obstructive quality of earth, the moistening quality of water, the burning quality of fire, and the moving quality of wind. It also has subatomic particles of color, smell, taste, and tactility. While an elementary particle is the smallest of all matter, an aggregated particle is the smallest of all aggregated matter. Moreover, an elementary particle is the lone initial particle, and an aggregated particle is formed by two or more elementary particles of the same chemical type, and composite particles are formed by particles of different chemical types (Jampalyang, 2013). The claim that though subatomic particles have potential to create shape and color they do not themselves have shape and color at a subatomic level, is a matter to be investigated. A subatomic particle is the smallest of matter, as Je Tsongkhapa said, “Particles that have been posited to be the smallest of matter cannot have parts such as east. As long as it has a directional part, it cannot be considered to be the smallest” (Tsongkhapa, 2019).

Buddhist philosophy considers a subatomic particle the smallest thing that makes up tangible matter. It is categorized into composite particles, aggregated particles, elementary particles, etc (Tsering, 2020). A subatomic particle functions as a substantial cause (main cause) or cooperative cause (causal conditions) giving rise to coarse physical objects by combining with other particles within the same group. Different schools of thought have different ways of understanding the nature of a subatomic particle in terms of it being partless, physically touching, and divisible. Although the two lower philosophical schools, which propound true existence, consider all subatomic particles partless and that they become part holders when touching one another, the Great Exposition School considers subatomic particles with gaps, while the Sutra School believes there are gaps between particles. The Mind Only School negates the existence of partless particles. The Middleway Autonomy School believes that ten physical realms are formed by the combination of subatomic particles, and that a subatomic particle has parts. The Middleway Consequence School thinks subatomic particles contain obstructions, as they obstruct others from coming in place, therefore they are unstable, dependently imputed, and compounded with eight elementary particles (Choesang, 2018). In Tantra, partless particles are rejected not only objectively but also subjectively.

According to science, a subatomic particle is the building block of matter and is categorized into quarks and leptons. Whether a photon is a particle or wave is a topic of debate. Although science is based on measurement, it evolved from philosophical origins in the case of particles or the smallest building blocks of matter. Though the term atom means “indivisible” in Greek and it was considered the smallest of matter, the discovery of electrons, protons, and neutrons brought atomic research to a new level. Matter divides into solid, liquid, gas and plasma. Atoms bind together through chemical reactions to form all matter in nature (Barberio, 2014). Some subatomic particles are as old as the universe and originated from the Big Bang. An atom is made up of protons, neutrons and electrons. While protons and neutrons make up the dense nucleus, electrons orbit around the nucleus in energy shells. The nucleons are made up of quarks (Barberio, 2014).

Although Buddhism does not have detailed accounts of subatomic particles like those demonstrated in measurable amounts in science, both traditions accept the notion of the material world forming from subatomic particles. His Holiness the Dalai Lama stated in a teaching that both science and Buddhism agree that our external material world is formed from subatomic particles. Thus, both traditions rely on experimental results to draw conclusions and develop theories rather than just follow hearsay. Though the unfindability of material existential fact in quantum science is similar to the indefinability of external objects in the Mind Only School, there is a difference, as quantum physics claims the existence of atoms and subatomic particles. During a teaching on the Fundamental Treatise on the Middle Way, His Holiness said that though scientists do not investigate the subtle and gross level consciousnesses, there are similarities between the scientific way of explaining existence of material things based on a specific object and Middle Way School’s claims about defining the nature of things by dividing matter into partless or with-part particles, and based on measurable things. As Buddhism understands the subtle level impermanence, on a particle level science claims that things are always vibrating (Lama, 2010). According to a commentary of Abhidharmakosa, seven subatomic particles form an atom, seven atoms form an iron atom, seven iron atoms form a water atom, and this sevenfold continues on to form particles of rabbit, sheep, elephant, solar ray, nit, louse, grain, and then finger’s width [inch] subsequently (Jampalyang, 2013). If we compare the total number of subatomic particles aligned in 1 m according to this theory, it surpasses quantum physicist Niels Bohr’s arrangement of 10 billion hydrogen atoms in 1 m. Moreover, the number of subatomic particles in a solar ray atom varies across different Buddhist texts, i.e. 343 according to Lalita-vistara-Sutra, 49 according to the World Systems, and 823,543 according to
Abhidharmakosa Root Text and Commentary (Gaden Podang, 2014). Therefore this has yet to be resolved by investigation.

Conclusion

Though the methods, goals, and philosophical backgrounds to investigate subatomic particles and atoms are different in science and Buddhist philosophy, I wish for a peaceful collaboration of knowledge based on open views, reasoning, and wisdom, as there are micro level particles as well as intangible consciousness that remain to be investigated.

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DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

AUTHOR CONTRIBUTIONS

JG wrote The Basic Human Nature, LG wrote Subatomic Particles and DD translated the articles from Tibetan.

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