

# Tibetan Buddhism and Modern Physics



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TOWARD A UNION OF LOVE AND KNOWLEDGE

Vic Mansfield

with a foreword by

HIS HOLINESS THE DALAI LAMA

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## Foreword

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HAVE A DEEP INTEREST in the close relationship between modern science and the study of the inner dimensions of the human mind. This is because we live in a physical world. We have a physical body and a mind, the two of which are closely interconnected. In fact, it is our experience of physical sensations and emotional responses as a consequence of these circumstances that make us sentient beings. Yet, if we compare the physical and mental influences upon our lives, it is clear that physical pain can be subdued by strength of mind; therefore, mental happiness and satisfaction are ultimately more important to us than physical discomfort and unhappiness. This is one of the reasons that spirituality, attention to our inner dimension, is so important. On the other hand, if someone is mentally unhappy, simple physical comfort does not relieve his or her mental distress.

I believe that it is the basic right of all beings, but particularly human beings, to lead a happy and successful life. In this context, science and technology have brought us a great deal of benefit. Because of advances in science and technology, some fundamental human problems have been solved, while other kinds of basic human misery, including disease and hunger, are being addressed. I have no doubt that science and technology can contribute toward the happiness of us all and that science is a vast and wonderful source of knowledge.

However, despite their achievements in many fields, we have not yet found a way to use science and technology to eliminate the worries and unhappiness that trouble so many people. Indeed, I think that the basic remedy for mental trouble, by nature, lies within the mind itself and that the potential for really solving problems of the mind exists only on a mental level. Therefore, while we certainly need science and technology, we also need a sense of spirituality, including ways to cultivate the warm-

heartedness and compassion that underpin our basic happiness.

Until recently, these two fields, science and spirituality, have remained distant and apart from each other, but I believe this is changing. For example, although I am a Buddhist, if I were to cling only to Buddhist teaching and deny what modern scientific findings prove, I would believe that the world is flat and at the center of the universe and that the sun and the moon revolve around it. Clearly, if I were to adopt an extreme stance and only consider what the scriptures say, keeping my distance from science, then I myself would suffer, not least due to a lack of knowledge.

The Buddhist tradition, particularly the thousand-year-old tradition of the Indian University of Nalanda that we inherited in Tibet, is concerned with trying to know reality, various levels of reality, through investigation, avoiding the pitfalls of underestimation and exaggeration. Modern science, too, is concerned with discovering reality, not only in theory but also in practice by conducting repeatable experiments. Whether we approach reality through science or through a spiritual path, we have to accept it as it is.

Vic Mansfield, whom I have known for many years, is someone who has reconciled his professional involvement with science with a deep interest in spirituality, and Tibetan Buddhism, in particular. He has taught and written widely about both. In this book, he has set out specifically to show how religion and spirituality are compatible with life in the modern world. I am grateful to him for responding to my appeal to people who have such knowledge to share it with others.

In today's world, we no longer live in the kind of isolation that allows us to dismiss views that are different from our own, for to do so can only be a source of conflict. Our increasing interdependence requires that we try to understand and appreciate other points of view. Readers will surely be rewarded by the light this book shines on the corresponding, but quite different, approaches to reality taken by Tibetan Buddhism and modern physics.

The Dalai Lama  
November 23, 2007

## Acknowledgments

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OVER THREE DECADES OF teaching have taught me that instruction is most effective when the teacher is motivated by love for the students and the subject matter. With these twin loves present and reinforcing each other, teaching truly quickens the mind and brings life out of darkness. I have been enormously fortunate in receiving much inspired teaching, and I therefore organize my acknowledgements by thanking my many teachers for their loving instruction. Although not all of them are still alive, their benign influence still lives in me.

I give thanks to the Sisters of Mercy, brides of Christ, who provided my first opening to the inner world and helped me express my religious urge. Moving to the Norwalk, Connecticut, public-school system in ninth grade was a major awakening. There I felt the radiant affirmation of Mrs. Fitzgerald, my homeroom teacher. I am deeply grateful for her gift of life-saving water to a thirsty plant. I give special thanks to Mrs. Donovan for revealing the startling beauty and depth of Shakespeare. I thank Mr. Gilmore for showing me the joy of mathematics and the rigorous of thought it afforded. I give special thank to Mr. Maruca, my woodworking shop instructor. He taught kindness by his every action.

I am also grateful for Mr. Gilmore's teaching of high school chemistry. As explained in my second book, *Head and Heart: A Personal Exploration of Science and the Sacred*, without Mr. Gilmore's love and inspiration, I would never have become a scientist. I am thankful that I have had the privilege of telling this directly to him in a public lecture. I offer gratitude to Mr. Clark for instruction in advanced algebra and analytic geometry—a virtuoso dance between kindness and mathematical rigor. Then I did not appreciate how little our culture values such people. I now

more fully realize how the twin loves of their students and their subject matter sustained their dedication and nourished me.

My horizons expanded enormously at Dartmouth College, where a diverse array of extraordinary teachers fired my love of science and the liberal arts. I thank Professor Sears for awakening me to the joyous exploration of the natural world through physics. I offer special thanks to Professor Doyle for showing me the extraordinary beauty of Maxwell's equations of electromagnetism. Without his inspired teaching, physics would have never made me its student. I offer special gratitude to Professor Christy who plunged me into the beauty and mystery of quantum mechanics, a subject that has held me captive for four decades. I thank Professor Laspere for his teaching excellence and unstinting support as my master's thesis advisor. My sincere gratitude extends to several members of the philosophy department of Dartmouth, not all of whose names I can recall after more than four decades. They team-taught an introduction to Western philosophy that opened my eyes to the wonder, rigor, and delight of philosophic thought.

At Cornell University special thank go to Professor Mermin. He elevated physics teaching to a high art form and deepened my understanding of quantum mechanics. I offer special thanks to Professor Terzian whose faith in me and unbounded enthusiasm for science sustained me during years of intense doubt. Special gratitude goes to Professor Spitzer who taught me how gentleness and intellectual rigor can combine into an inspiring year of graduate mathematics. I thank Professor Gottfried whose brilliant teaching threw a penetrating light into the depths of the quantum world. I express deep gratitude to Professor Salpeter, a man of extraordinary kindness and scientific brilliance, for drawing the best out of me as my research mentor.

Moving westward, I thank Professor Petrosian of Stanford University. When my spiritual journey called me to California for extended explorations of the murky depths of the psyche, he kept my interest in physics alive. Without doubt, his unique combination of generosity and scientific excellence allowed me to return to Cornell and complete my Ph.D.

I end my academic homage by offering special thanks to Colgate University, which has been my home for most of the last three decades. I never cease to be amazed at what a privilege it is to be a professor. I have especially appreciated the opportunities to teach in the General Education Program, where my Tibet course found a happy home. In particular,

I thank the members of the Physics and Astronomy Department, who have supported my unconventional interests. Each of my departmental colleagues has been my teacher in many ways, but I especially thank Professors Galvez and Malin for helping me appreciate various wonders of the natural world. Finally, I thank Peter Tagtmeyer, research librarian extraordinaire. Through hard work and wizardry, he repeatedly found the smallest needles in the largest haystacks.

Outside of academia, friends have showered much love on me over the decades. I especially thank my many brothers and sisters at Wisdom's Goldenrod Center for Philosophic Studies. They have shared with me nearly four decades of interest in spiritual, philosophic, and religious study and their associated meditation disciplines. Although too numerous to mention all of them, I especially thank Avery Solomon, Richard Goldman, Lauren Cottrell, and Andrew Holmes. I offer singular thanks to my good friend and editor Paul Cash, who directly showed his affection by making many helpful suggestions for improvements to this book.

Beyond Goldenrod, I particularly wish to thank Craig Preston and Lharampa Geshe Thupten Kunkhen for their patience, generosity, and sharing of their understanding of many subtle points within Tibetan Buddhism. I offer heartfelt thanks to Dr. Alan Wallace and Dr. Jordi Pigem for extensive and helpful comments on an early draft of this book.

I offer sincere thanks to the Templeton Foundation Press for the care lavished on this book and me. Their idealism and commitment to excellence is truly inspiring. I particularly thank Laura Barrett, acquisitions/managing editor, and the editor Mary Lou Bertucci for their dedication and skill at every step in the publishing process.

I conclude by turning to the immense love showered upon me by spiritual teachers. I offer them my deepest appreciation, fully aware that words cannot convey the burden of my heart. I first offer deep gratitude to my wife and best friend Elaine. She has helped me through innumerable intellectual and emotional thickets for nearly four decades. I thank her most of all for teaching me about the depth and sublime beauty of love. I offer deepest gratitude to my root guru Anthony Damiani. Although he has been dead for nearly a quarter of a century, he vividly lives in my heart, where I offer him thanks every day for sharing his passionate and penetrating analysis of several great religious traditions, both East and West. He taught me how to meditate and the supreme importance of

attempting a personal realization of the great truths embodied in these noble traditions.

I give thanks to the late Paul Brunton for his encyclopedic writings and personal example of Himalayan spiritual heights. I especially thank him for encouraging me to write about science and spirituality. I offer special gratitude to the late Shri Shankara of Konchipuram, India, the sixty-eighth holder of a title stretching back to the great Adi Shankara, the founder of Advaita Vedanta, the crown jewel of Hinduism. Although we spoke few words, I offer him my sincerest thanks for radiating his astonishing love and wisdom out of a great well of silence. I thank Father Raimon Panikkar whose knowledge and love showed me the true universality embodied in Catholicism. I especially thank him for encouraging me in my writing about science and spirituality. Finally, I offer profound thanks to His Holiness the Dalai Lama, a living expression of wisdom and compassion. Along with all he has taught me about Buddhism, his tireless efforts to understand the relationship between science and spirituality are a continuous inspiration for me. He has taught me that the collaboration between science and spirituality can be a great avenue for the relief of human suffering.

# Tibetan Buddhism & Modern Physics



# 1. What Are Buddhism and Science?

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## *Why Is a Dialogue Needed?*

### INTRODUCTION



IT IS THE FALL of 1979, the beginning of one of the greatest educational events in my life. His Holiness the Dalai Lama is getting off a light airplane at the Ithaca, New York, airport. We members of Wisdom's Goldenrod Center for Philosophic Studies are eagerly awaiting his arrival and deeply honored that he is visiting us during his first tour of North America. Although my knowledge of him is limited, I have high spiritual expectations. I am, therefore, surprised that the first thing he does in getting out of the little plane is to lay his hands on the aileron (the hinged flap on the trailing edge of an aircraft wing, used for controlling flight) and work it up and down. Being a physicist, I am delighted to see him examining the mechanics of flight.

Over the next few days, I am awed by the Dalai Lama's keen intelligence, his deep spirituality, and the force of his personality. The picture here shows him at that time with our teacher Anthony Damiani, the founder of Goldenrod. From their first meeting in 1979, the Dalai Lama and Anthony formed a deep friendship. Our group consequently has enjoyed a special relationship with His Holiness, and we have met with him several times through the ensuing years.

I soon learned that the Dalai Lama's interest in the aileron and the mechanics of flight expressed his lifelong interest in science and things mechanical, from the physical and life sciences to his interest in fixing watches. Although not formally trained in science, the Dalai Lama has a keen scientific aptitude. The internationally famous Austrian physicist Anton Zeilinger has spent many days discussing quantum physics with him—both in India and in Austria. A few years ago, Anton told me that he half jokingly invited the Dalai Lama to be his graduate student in physics. Anton has written, "His Holiness might have become a great