SCIENCE AND BUDDHISM

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The following article is based on a presentation made on August 2, 1996, at the 1996 Conference of the Society for Buddhist-Christian Studies at DePaul University in Chicago. The presentation was part of a symposium that featured five SGI-USA speakers under the theme, "The Practice of Nichiren Daishonin's Buddhism in Modern Society: The Soka Gakkai Approach to the Twenty-first Century."

ACONCEPT that has caught the imaginations of many people in various disciplines now is that of paradigms. Briefly defined, a paradigm is a world-view or a unifying, overarching picture of reality governing an aspect of existence. In science, paradigms are often considered to be universal laws, such as Newton's laws of motion or the Second Law of Thermodynamics. They are even referred to as theories, such as Einstein's Theory of General Relativity or Darwin's Theory of Evolution Through Natural Selection, although they are generally accepted as the best descriptions of phenomena within their purview at this time.

What determines whether a paradigm is accepted as a powerful, useful description of reality? First, it must have explanatory power. Darwin's Theory of Evolution Through Natural Selection provides a plausible basis for the emergence of life's diversity from the laws of chemistry and physics. Second, it must have predictive power. Newton's laws of motion enable one to predict the locations of planets in the distant future, to the advantage of astrophysicists and astrologers, alike. The history of paradigms in science has been a progression toward greater explanatory and predictive power, indicating a convergence with what can be considered to be absolute reality. Science, by its own admission, however, can never achieve complete convergence with absolute reality, since it utilizes inductive reasoning from individual cases to generalities. The prevailing paradigm is tested by scientists using deductive reasoning to predict the outcome of artificially created cases, or experiments, based on the paradigm. Because the universe is infinite, all cases can never be examined and, therefore, the paradigm cannot be proven with absolute certainty.

On the other hand, the systems of beliefs and practices central to a philosophy of life, which can be considered religious paradigms, are not inferred from individual cases, but instead are revealed and are, therefore, absolute. Viewed scientifically, absolute paradigms only permit deductive reasoning. Since religious paradigms generally govern life experiences, attitudes and conduct, testing them would lead one to conclude that religions tend to be paradigms in crisis. The philosopher of science Thomas Kuhn defined a paradigm in crisis as one that has suffered too many failed tests or anomalies that cannot be resolved without making implausible adjustments to the paradigm. This, then, is the problem of engaged religion in a scientific age: Why does religion appear to be incompatible with practical reason?

BOTH theological and secular scholars, such as the mythologist Joseph Campbell, have argued that mythic elements in religions constitute a set of metaphors that instruct the spiritual and cultural development of human beings, but an absolute paradigm must include phenomenal, as well as spiritual, reality. I will argue that two Buddhist concepts exemplify how religious philosophy can serve as an absolute paradigm

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governing both the objective and subjective aspects of life.

The Buddhist concept of the oneness of life and its environment refers to the belief that all life and the environment in which it exists are inseparable, or simply two aspects of the same entity. Furthermore, the environment reflects the life-conditions of the people that inhabit it and the three poisons of greed, anger and stupidity inherent in people's lives manifest the calamities of famine, warfare and pestilence. The most immediate evidence for the truth of this concept is that humans increasingly exert a direct influence on the environment. For instance, preoccupation with profit has led to such effects as deforestation, the greenhouse effect and erosion of the atmospheric ozone layer, all of which threaten to affect climate and agricultural production disastrously.

Our age has witnessed a proliferation of wars, both international and civil, in which intense hatreds have spawned nearly inconceivably brutal atrocities; Cambodia, Rwanda and Bosnia immediately come to mind, not to mention the enduring lessons of World War II. AIDS has signaled the reemergence of epidemic infectious diseases after a brief generation-long hiatus in the West. Stupidities such as failure of governments and populations to teach and observe safe sex practices, unleashing of deadly viruses by shortsighted environmental disruptions, disregard of continuing epidemics in the Third World, and viewing the need to refine antibiotic development as unprofitable have all led to pestilence.

The whole world is discovering a deeper basis for the view that life and its environment are one, what Buddhism has long known as dependent origination, the elaborate interconnectedness of everything, so that every action somehow perturbs the larger web of life that radiates throughout the entire universe. An example often used to support chaos theory is that a butterfly fluttering its wings over West Africa can initiate a cascade of events ultimately producing a hurricane in the Western Hemisphere.

At the very frontiers of modern science is the field of quantum physics, which offers the startling realization that even an objective observation made with instruments is conditioned by the observer. For instance, light will appear to be made up of waves or particles, depending on what you use to observe it. Likewise, Buddhism teaches that life will appear to be the inner reaches of the human mind or a barren mountain, depending upon how you look at it. The oneness of life and environment is also appreciated in the biological and behavioral sciences, since it has been learned that animals, including humans, structure the environment they perceive to enhance their ability to adapt to it. We sense only a small portion of the sound and light spectrums, apparently because that best suited our survival in the environment in which humans arose—the Pleistocene Epoch of two million years ago.

ULTIMATELY, this oneness of life and environment concept depends upon a second Buddhist concept, that of the inseparability of body and mind. This concept is now being actively elucidated by the emerging science of psychoneuroimmunology, which has provided Depak Chopra with much of the basis for his system of mind-body medicine. A deeper, more profound meaning of this term, however, is the oneness of the spiritual and material aspects of life or the fundamental equality of the objective and subjective realms. According to Buddhism, therefore, the subjective aspects of life are dimensions just like the four objective dimensions of space-time. The three realms expounded by the Chinese Buddhist sage Chih-i, or Chih-che, indicate that these

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number six: form, perception, volition, cognition, consciousness and aggregates of living beings, for a total of ten dimensions. Interestingly, the most recent attempts to unify all phenomena in one principle, such as Superstring Theory, require ten dimensions to make the mathematics come out right.

Here, religious philosophy can act as a true paradigm, leading and explaining scientific inquiry. One of the most mind-boggling aspects of quantum physics derives from the fact that light cannot behave as both a particle and a wave at the same time. If light is shined through two slits in an opaque plate, it will project a wave pattern on a screen behind it; but, if the experiment is rigged to provide information about which slit each light particle, or photon, traveled through, the wave pattern will disappear. One explanation for this finding would be that the photons somehow become separated in another dimension that keeps them from interfering with each other to produce the characteristic wave pattern. According to the Buddhist concepts of the inseparability of body and mind and the three realms, these photons entered the dimension of cognition when the observer became aware of their exact paths, separating them and preventing their interference. Needless to say, this possibility gives rise to exciting experimental prospects.

THE concept of religion as universal paradigm means that each person becomes a scientist experimenting with his or her own life, over which he or she has total control. Practice of such a religion would link a positive inner human reformation with the healing and flourishing of the environment. The phenomenon of transforming the land through an inner reformation of life is explained in a thesis by Nichiren titled "On Securing the Peace of the Land through the Propagation of True Buddhism." In keeping with this spirit, the Soka Gakkai International (SGI) is dedicated to the promotion of peace, culture and education throughout the world, based on the influence of Nichiren's teachings, both individually and collectively.

SCIENCE and technology, certainly, are central to the achievement of all three goals. The devastation of two Japanese cities in 1945 by nuclear bombs developed by the scientific enterprise known as the Manhattan Project is an enduring stain on the integrity of science and all scientists. The second and third presidents of the Soka Gakkai, Josei Toda and Daisaku Ikeda, tirelessly excoriated the maintenance of nuclear arsenals by nations and repeatedly identified this as the major threat to our planet. This threat remains even now in the post-Soviet age and has acquired an ominous cast in light of national destabilizations and the steady increase of terrorist activities worldwide.

Added to the nuclear legacy of misguided science are the dangers of chemical and biological warfare. The former is being appreciated in the aftermath of the Gulf War and the latter is particularly chilling when considering that students from all over the world are learning the relatively cheap and accessible, but extremely powerful, recombinant DNA technology in Western universities, while viral epidemic diseases of unprecedented virulence are emerging in the Developing Nations. The potential threats of these developments are compellingly described by Laurie Garrett in her book, *The Coming Plague*. The familiar retreat of scientists into the guiltless and guileless world of pure science that has permitted dark technological applications to emerge should become a badge of shame in future years.

Science and the philosophy of modern rationalism that underlies it have had an

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indescribably profound impact on the course of Western culture and now all cultures. The deleterious impact of this development on the human psyche and cultural values have been described by detractors ranging from Pascal and Rousseau to Nietzsche and a host of contemporary commentators, including Anthony Burgess and Jeremy Rifkin. Now, the rise of popularized participatory cybernetics known as the computer age and the Internet is likely to make even more pervasive the two-dimensionality of the television age that has contributed so much to the dehumanization of modern society.

The potential benefits of these technologies, however, are undeniable and can greatly enhance the quality of life if efforts are made to emphasize the supremacy of penetrating life-to-life dialogue among people of diverse backgrounds. The Soka Gakkai has done much to promote such dialogue in its own activities and forums such as this one.

SGI President Ikeda has stated unequivocally that education is the most important endeavor of the present age. To this end, he has established the Soka school and university system in Japan and the United States, which is based on the value-creating educational philosophy of the Soka Gakkai's first president, Tsunesaburo Makiguchi. Science instruction especially can benefit from this approach. Youth today increasingly shun science and mathematics, believing them to be cold, sterile and dehumanizing. In fact, science, which often requires mathematics to be understood and practiced, is a philosophy that was created by human beings for the benefit of other human beings. It is an indispensable tool for teaching people how to think and function capably as modern world citizens. Not least, it is interesting and a wonderful means for expressing human creativity when taught properly. I look forward to the realization of science's pedagogical role in a humanistic educational setting.

On a personal note, I can say that, as a scientist who practices this Buddhism and as a member of the SGI, I have become impressed with the importance of fortune in science, which is so important to the discovery process. Conducting research science is a good way to monitor the ability of a religion to generate good fortune, from the behavior of temperamental instrumentation to the progress of the research process and, most important, contribution to the well-being of people. I can attest that actual proof can proceed from documentary and theoretical foundations in religion, as it does in science, provided the underlying paradigm is sound and robust. ❑

Melvin Klegerman received his Ph.D. in biochemistry from Loyola University of Chicago in 1984. At the time of this presentation, he was associate director of the Institute for Tuberculosis Research at the University of Illinois at Chicago, where he continues to serve as adjunct assistant professor in the College of Pharmacy. He is now involved in starting a contract research organization, the Mid-Atlantic Biomedical Research Laboratories, in the Washington, D.C. area. His current activities focus on the development of anti-cancer drugs that stimulate the immune system.

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