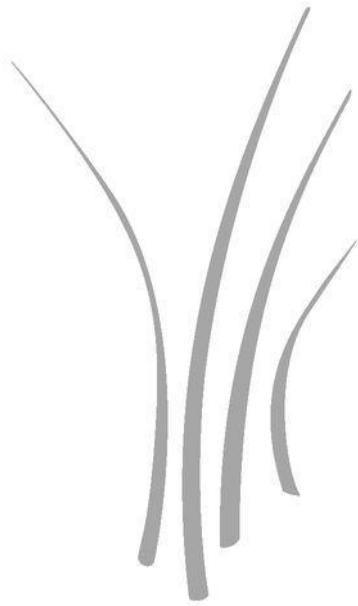


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CONTEMPLATIVE SCIENCE

WHERE BUDDHISM AND NEUROSCIENCE CONVERGE



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ŚAMATHA

THE CONTEMPLATIVE REFINEMENT OF ATTENTION



THE NATURE AND PURPOSE OF ŚAMATHA

Buddhist inquiry into the natural world proceeds from a radically different point of departure than Western science, and its methods differ correspondingly. As discussed previously, the pioneers of the scientific revolution, including Copernicus, Kepler, and Galileo, expressed an initial interest in the nature of the physical objects farthest removed from human subjectivity, such as the relative motions of the sun and earth, the surface of the moon, and the orbits of the planets. And a central principle of scientific naturalism is the complete objectification of the natural world, free of any contamination of subjectivity. This principle of objectivism demands that science deal with empirical facts testable by third-person means; such facts must, therefore, be public rather than private—accessible to more than one observer.

Another aspect of this principle is that scientific knowledge—paradigmatically, knowledge of astronomy and physics—must be epistemically objective, which is to say, observer-independent. A profound limitation of this ideal is that it cannot accommodate the study of subjective phenomena, which presumably accounts for the fact that the scientific study of the mind did not even begin until three hundred years after the launching of the scientific revolution. And it was roughly another hundred years before the nature of consciousness came to be accepted as a legitimate object of scientific inquiry. In short, the principle of objectivity excludes the subjective human mind and consciousness itself from the domain of natural science.

In stark contrast to this objective orientation, Buddhism begins with the premise that the mind is the primary source of human joy and misery and is central to understanding the natural world as a whole. In a well-known discourse attributed to the Buddha, he declares, “All phenomena are preceded by the mind. When the mind is comprehended, all phenomena are comprehended.” ¹ The mind and consciousness itself are therefore the

primary subjects of introspective investigation within the Buddhist tradition. Moreover, just as unaided human vision was found to be an inadequate instrument for examining the moon, planets, and stars, Buddhists regard the undisciplined mind as an unreliable instrument for examining mental objects, mental processes, and the nature of consciousness.

Drawing from the experience of earlier Indian contemplatives, the Buddha refined techniques for stabilizing and refining the attention and used them in new ways, much as Galileo improved and utilized the telescope for observing the heavens. Over the 2,500 years since, Buddhist contemplatives have further developed and made use of those methods for training the mind, which they regard as the one instrument by which mental phenomena can be directly observed. As a result of their investigations, they have formulated elaborate, sophisticated theories of the origins and nature of consciousness and its active role in nature, but their inquiries have not produced anything akin to an empirical study or theory of the brain.

They did, however, develop rigorous techniques for examining and probing the mind firsthand. The initial problem was to train the attention so that it could be a more reliable, precise instrument of observation. Without such training, it is certainly possible to direct one's awareness inward, but the undisciplined mind has been found to succumb very swiftly to attentional excitation, or scattering; when it eventually calms down, it tends to drift into attentional laxity in which vividness is sacrificed. A mind that is alternately prone to excitation and laxity is a poor instrument for examining anything, and indeed, the Buddhist tradition deems it "dysfunctional."

Thus, the first task in the Buddhist investigation of the mind is to so refine the attention and balance the nervous system that the mind is made properly functional, free of the detrimental influences of excitation and laxity. Those two hindrances must be clearly identified in terms of one's own experience. Excitation, the first obvious interference in observing the mind, is defined as an agitated mental process that follows after attractive objects,² and it is a derivative of compulsive desire.³ Laxity is a mental process that occurs when the attention becomes slack and the meditative object is not apprehended with vividness and forcefulness. It is said to be a derivative of delusion.

The genre of attentional training Buddhists have devised to counteract excitation and laxity is known as *śamatha*, the literal meaning of which is “quiescence.” *Śamatha* is a serene attentional state in which the hindrances of excitation and laxity have been thoroughly calmed. The central goals of its cultivation are the development of attentional stability and acuity. In Buddhist psychology, the continuum of awareness is composed of successive moments, or “pulses,” of cognition each lasting on the order of one millisecond.⁴ Moreover, commonly in a continuum of perception, many moments consist of nonascertaining cognition, that is, moments in which objects *appear* to the inattentive awareness but are not *ascertained*, or consciously recognized so that they can be recalled later.⁵

In terms of this theory, I surmise that the degree of attentional stability increases in relation to the proportion of moments of ascertaining cognition of the intended object; that is, as stability increases, fewer and fewer moments are focused on any other object. This makes for a homogeneous continuum of perception. The degree of attentional vividness corresponds to the ratio of moments of ascertaining to nonascertaining cognition: the higher the frequency of the former, the greater the vividness. Thus, the achievement of *śamatha* entails an exceptionally high density of homogenous moments of ascertaining consciousness.

To return to the analogy of the telescope, the development of attentional stability may be likened to mounting a telescope on a firm platform; the development of attentional vividness is like highly polishing the lenses and bringing the telescope into clear focus. Recall the more traditional analogy, cited earlier, to illustrate the importance of attentional stability and vividness for the cultivation of contemplative insight: in trying to examine a hanging tapestry at night, if you light an oil lamp that is both radiant and unflickering, you can vividly observe the depicted images. But if the lamp is either dim or—even if it is bright—flickers due to wind, you cannot clearly see those forms.

THE USE OF A MENTAL IMAGE AS THE OBJECT IN ŚAMATHA PRACTICE

Among the wide variety of techniques devised for the cultivation of *śamatha*, one of the most commonly practiced among Tibetan Buddhist contemplatives entails focusing the attention upon a mental image. It may be of a visual object, such as a stick or a pebble, although Tibetan Buddhists tend to prefer mental images having great religious significance to them, such as an image of the Buddha.⁶

Regardless of the particular technique followed in the pursuit of *śamatha*, two mental faculties are said to be indispensable for the cultivation of attentional stability and vividness: mindfulness and introspection. The Pāli term translated here as “mindfulness” (*sati*) also has the connotation of “recollection,” and it is the faculty of sustaining the attention upon a familiar object without being distracted. Thus, when using a mental image as the meditative object, mindfulness is applied steadily to it. Moreover, the image must be clearly ascertained, otherwise the full potency of attentional vividness cannot arise, subtle laxity is not dispelled, and concentration will remain flawed.

Mindfulness of a mental image is said to be a kind of mental perception. In the actual practice of *śamatha* it is common first to attend visually to an actual physical object, such as a pebble, and once one has grown thoroughly familiar with its appearance, to reconstruct a mental image of it and focus on that. In that phase of practice, mental perception apprehends the form of the pebble by the power of the visual perception of it. Thus, mental perception does not apprehend the pebble directly, but rather *recollects* it on the basis of the immediately preceding visual perception.

According to Buddhist psychology, the mental image of the pebble is not a mental faculty or process, for it does not cognize its own object, but neither is it material in the Buddhist sense of being composed of particles of matter. Rather, it is regarded as a form for mental consciousness,⁷ of the

same type as the forms that appear in the dream state. In this practice, mindfulness is focused on that mental image itself, not on the physical pebble of which the image is a likeness. In other words, it is the function of mindfulness to sustain the recollection of the image of the pebble, steadily observing it “internally” in a manner analogous to the visual observation of the pebble itself.

Mindfulness is the principal means of accomplishing *śamatha*, but it must be accompanied by the mental faculty of introspection. While mindfulness attends unwaveringly to the meditative object, introspection has the function of monitoring the meditative process. Thus, introspection is a type of metacognition that operates as the “quality control” in the development of *śamatha*, swiftly detecting the occurrence of either excitation or laxity. In the Buddhist tradition, introspection is defined as the repeated examination of the state of one’s body and mind,⁸ and it is regarded as a derivative of intelligence.⁹

The Buddhist assertion of the possibility of introspection as a form of metacognition raises the interesting problem of whether or not it is possible for the mind to observe itself. Buddhists generally assert that at any given moment, consciousness and its concomitant mental processes have the same intentional object, and at any given moment, only one consciousness can be produced in a single individual.¹⁰ Moreover, a famous discourse attributed to the Buddha declares that the mind cannot observe itself, just as a sword cannot cut itself and a fingertip cannot touch itself; nor can the mind be seen in external sense objects or in the sense organs.¹¹

I suspect the rationale behind that assertion is that even when one is aware of one’s own subjective experience of an object, there is still a sense of separateness between the observer of that experience and the experience itself. The sense of duality remains. Within the context of ordinary, dualistic cognition, there can be no subjective awareness without an object, just as there can be no object without reference to a subject that cognizes or designates it. According to Tibetan Buddhist philosophy, subject and object are mutually interdependent. All phenomena experienced as subjects and objects arise within, and in dependence upon, the conceptual framework in which they are designated.

When one observes one’s own subjective experience of an object, the observer seems to be distinct from that experience, and if one takes note of that observer, there remains a sense of duality between the noted observer

and the one who notes that observer. This hypothesis of an observer perceiving a simultaneously existing observer perceiving a simultaneously existing observer leads to an infinite regression. Śāntideva avoided this problem by suggesting that instead of such metacognition occurring with respect to a simultaneously existing cognition, one is rather *recollecting* past moments of consciousness. In short, he hypothesized that it is possible to recollect a subjective experience that was not previously cognized as a distinct, isolated entity. In his view, when one remembers seeing a certain event, one recalls both the perceived event and oneself perceiving that event. The subject and object are recalled as an integrated, experienced event, in which the subject is retrospectively identified as such; but he denied that it is possible for a single cognition to take itself as its own object.^{[12](#)}

THE STAGES OF DEVELOPMENT OF ŚAMATHA

Progress in the gradual training leading up to the achievement of *śamatha* is mapped out in terms of nine successive attentional states. The initial challenge is to develop a continuity of sustained, voluntary awareness, but in the first state, called “directed attention,” the mind is strongly dominated by excitation. Indeed, because one is now consciously trying to sustain the attention unwaveringly on a single object instead of allowing it to roam freely, the mind seems more overwhelmed by compulsive ideation than usual. One brings the mental image to mind, but almost immediately it is lost and the attention is scattered.

This initial, limited capacity for sustained attention is borne out by modern experiments that have measured transient, focused attention on the basis of the performance of simple sensory tasks. Such research indicates that this transient, high level of focused attention lasts between one and three seconds. ¹³ Scientific investigation of attention during the late nineteenth century also suggested that voluntary attention cannot be sustained for more than a few seconds at a time. Such research led William James to conclude, “*No one can possibly attend continuously to an object that does not change.*”¹⁴

According to the Buddhist tradition, it is very difficult to attend continuously to an object that does not change, but the ability can be developed through sustained training. During the successive stages of *śamatha* practice, even the presence of mindfulness and introspection is no guarantee that progress will be made, for one may recognize the presence of laxity or excitation and still fail to take steps to counteract it. The remedy is the cultivation of the will, which is closely associated with intervention and effort. According to Buddhist psychology, the will is the mental process that intentionally engages the mind with various types of objects and activities. In this case, when either laxity or excitation occurs, the mind is stimulated

by the will to intervene in order to eliminate them. The relationship of the mind to the will is likened to that of iron that moves under the influence of a magnet. The will to eliminate laxity and excitation is aroused by recognizing the disadvantages of succumbing to those hindrances and the advantages of overcoming them.¹⁵ Thus, the initial two phases of this training are accomplished by learning about the nature of the practice and contemplating the benefits of pursuing it.

At the outset, one is encouraged to practice for many short sessions each day with as few distractions between sessions as possible. As a result of persevering in this practice, it is said that one ascends to the second state, called “continuous attention.” During this phase, the mind is still subject to so much excitation that the attention is more often away from the object than on it, but at times one experiences brief periods of attentional continuity, for up to a minute or so. In other words, occasionally, for up to a minute, the attention does not completely disengage from the chosen mental image. But even during those periods of sustained attention, the mind is still prone to excitation, which manifests as peripheral “noise” or mental chitchat. Experientially, it seems as if the attention is still fixed on the mental image even while other thoughts and sensory impressions come to mind. According to Buddhist psychology, however, it seems more likely that the attention is disengaged from the mental image during those interludes, but they are so brief that there seems to be an unbroken continuity of attention to the main object. In any case, at this point only a gross level of attentional stability has been achieved, and that too is interspersed with periods of gross excitation, in which the meditative object is forgotten altogether.

With further training, one gradually reduces the number of sessions per day while increasing their duration. The emphasis is always on maintaining the highest quality of attention, rather than opting for mere quantity of time spent. The next state in this development is called “resurgent attention,” at which point the attention is mostly on the meditative object, and its continuity needs only to be reinstated now and then when gross excitation occurs. Thus, there are more frequent periods of sustained attention, and they are of longer duration.

When one accomplishes the fourth state, called “close attention,” the mind is stabilized to the point that one does not entirely disengage from the meditative object for the full duration of each session. The third and fourth

states are achieved chiefly by the cultivation of mindfulness, and the principal emphasis up to that point is on the development of attentional stability, rather than vividness. In fact, Buddhist contemplatives have found that if one strives initially for enhanced vividness, that effort will actually undermine the development of stability. With the attainment of close attention, the power of mindfulness is well exhibited, gross attentional stability is achieved, and the mind is free of gross excitation.

Particularly at this point in the training, it is very easy to fall into complacency, a feeling of having already achieved the aim of sustained, voluntary attention. In reality, one is still very much subject to subtle excitation and to both gross and subtle laxity, and Tsongkhapa warns that if one fails to recognize these flaws, continued practice may actually impair one's intelligence. William James was also aware of pathological cases in which the mind was possessed by a fixed and ever monotonously recurring idea, and he mistakenly concluded that those were the only kind of cases in which the attention does become fixed on an unchanging object.¹⁶ According to all the evidence available to him, voluntary attention is by necessity only a momentary affair.¹⁷ Buddhist contemplatives maintain, on the contrary, that mental health can be retained and even enhanced as long as one cultivates a high degree of vividness in such sustained attention. The principal difference between such meditatively stabilized awareness and the kind of attention that occurs, for example, in obsessive-compulsive disorders is that the meditative awareness is voluntary and supple. It can be directed at will, instead of being obsessive or compulsive.

The fifth attentional state, called "tamed attention," and the sixth, called "pacified attention," are achieved with the force of introspection, with which one closely monitors the meditative process, watching for the occurrence of laxity and subtle excitation. In the stage of taming, gross laxity, in which vividness of the attention is missing, is dispelled; in the phase of pacification, subtle excitation is eliminated, so that even peripheral distractions disappear.

By that time, an increasing sense of joy and satisfaction arises while meditating, so the seventh and eighth attentional states of "fully pacified attention" and "single-pointed attention" are achieved by the force of enthusiasm. In the seventh state even subtle laxity, in which the full potency of attentional vividness is not attained, is eliminated; in single-pointed attention, the mind can dwell with utter stability and vividness on its chosen

object for hours on end, without the occurrence of even subtle laxity or excitement. William James predicted that if the attention were concentrated on a mental image long enough, it would acquire before the mind's eye almost the brilliancy of a visually perceived object,¹⁸ and this is exactly what Buddhist contemplatives report from their experience at this point of the training.

With the attainment of the ninth state, called "attentional balance," accomplished with the force of familiarization, only an initial impulse of will and effort is needed at the beginning of each meditation session; after that, uninterrupted, sustained attention occurs effortlessly. Moreover, the engagement of the will, effort, and intervention at this point is actually a hindrance. It is time to let the natural balance of the mind maintain itself without interference.

THE ATTAINMENT OF *ŚAMATHA*

Even at the state of attentional balance, *śamatha* has still not been fully achieved. Its attainment is marked first by a dramatic shift in the nervous system, characterized briefly by a strange but not unpleasant sense of heaviness and numbness on the top of the head. This is followed by an obvious increase in mental and then physical pliancy, entailing a cheerfulness and lightness of the mind and a buoyancy and lightness of the body. Consequently, experiences of physical bliss and then mental bliss arise, which are temporarily quite overwhelming. But that rapture soon fades, and with its disappearance, the attention is sustained firmly and calmly upon the meditative object, and *śamatha* is fully achieved. The above claims concerning a shift in the nervous system and its consequences have to do with firsthand, empirical, physiological experiences. It remains to be seen how, or whether, such a theory and the corresponding physiological changes can be detected objectively and understood in modern scientific terms.

With the achievement of *śamatha*, one disengages the attention from the previous meditative object, and the entire continuum of attention is focused single-pointedly, nonconceptually, and internally in the substrate consciousness, withdrawn fully from the physical senses. Thus, for the first time in this training, one does not attempt to recall a familiar object or mentally engage with it. One's consciousness is now left in an absence of appearances, an experience that is said to be subtle and difficult to realize. Only the aspects of the sheer awareness, luminosity, and joy of the mind remain, without the intrusion of any sensory objects. Any thoughts that arise do not persist, nor do they proliferate; rather, they vanish of their own accord, like bubbles emerging from water. One has no sense of one's own body, and it seems as if one's mind has become indivisible with space.

While remaining in this absence of appearances, even though it is still impossible for a single moment of consciousness to observe itself, one

moment of consciousness may recall the experience of the immediately preceding moment, which, in turn, may recall its immediately preceding moment—each moment having no other appearances or objects arising to it. Thus, due to the homogeneity of this mental continuum, with each moment of consciousness recalling the previous one, the experiential effect is that of consciousness apprehending itself.

The defining characteristics of consciousness retrospectively perceived in that state are first a sense of *clarity*, or implicit luminosity capable of manifesting as all manner of appearances, and second the quality of *cognizance*, or the event of knowing. Upon attaining *śamatha*, by focusing the attention on the *sheer* clarity and the *sheer* cognizance of experience, one attends to the defining characteristics of consciousness alone, as opposed to the qualities of other *objects* of consciousness.

THE USE OF NONIDEATION AS THE OBJECT IN ŚAMATHA PRACTICE

If one's chief aim in developing *śamatha* is to ascertain the nature of consciousness, one might ask whether a more direct strategy—not engaging with a mental image or any other object—might be used. Many Buddhist contemplatives have in fact trained in an alternative technique of cultivating nonconceptual attention from the outset, without focusing on any other object such as a mental image. In this method the eyes are left open, gazing vacantly into the space ahead. According to Buddhist psychology, this space is a type of form that is apprehended by mental, not sensory, perception.¹⁹ Mentally, one completely cuts off all thoughts of the past, future, and present. Bringing no thoughts to mind, one lets it remain like a cloudless sky, clear, empty, and evenly devoid of grasping onto any kind of object.

In this, as in all other techniques for the development of *śamatha*, attentional stability and vividness are cultivated by means of mindfulness and introspection. The object of mindfulness is the mere absence of ideation, and with introspection one monitors whether the mind has come under the influence of excitation or laxity. Tsongkhapa especially emphasized that while following this method, one must *ascertain* the absence of ideation as the meditative object, rather than simply letting the mind go blank. His concern, I presume, was to ensure that the meditator does not drift into a nebulous trance but maintains an actively engaged intelligence throughout this training. In this way, one progresses through the nine attentional states explained previously. Eventually *śamatha* is achieved, and—as in the previous method—it is characterized by joy, luminosity, and nonconceptuality.²⁰

Buddhist contemplatives raise the question of whether this nonconceptual state of *śamatha* actually transcends all conceptual structuring and modification and whether the mere suppression of ideation is sufficient for

entering a totally nonconceptual state of awareness. The eminent Tibetan Buddhist contemplative Karma Chagmé (1612–1678) voiced the consensus within the Tibetan tradition when he asserted that although this state may easily be mistaken for conceptually unstructured awareness, it is not unmodified by ideation, for one still maintains the conceptual sense that attention is being sustained in the absence of conceptualization.²¹

Once *śamatha* is achieved, the conceptually discursive mind becomes almost entirely quiescent. Only occasionally does an isolated thought or mental image fleetingly arise, only to fade back into the space of awareness, with no ripple effect. But even though one's awareness seems to be devoid of thoughts, there is still a subliminal sense of subject and object and other indications that this experience is subject to precognitive conceptual structuring. So the vacuum state of the mind of *śamatha* is relatively empty of conceptual content, but not absolutely so.

SETTLING THE MIND IN ITS NATURAL STATE

There is something contrived about the above state of nonconceptuality, for during the training that leads to it, the mind has been artificially withdrawn from appearances and ideation has been suppressed. The consciousness in which one perceives the characteristics of joy, luminosity, and nonconceptuality has been conceptually isolated from its normal processes and from the appearances with which it is normally engaged. The question may then be raised: Is it not possible to identify the natural characteristics of consciousness in the midst of the mind's activity, without suppressing ideation? After all, consciousness is obviously present and active while thoughts arise, so in principle there seems no reason it could not be identified.

It is for this purpose that the technique of “settling the mind in its natural state” has been devised and taught within the Indo-Tibetan Buddhist tradition. ²² Like all other techniques for developing *śamatha*, it entails freeing the mind from distraction, so that the attention is not compulsively carried away by either mental or sensory stimuli. However, this method is exceptional in that the attention is not fixed upon any object. One gazes steadily into the space ahead, but without visually focusing on anything. Mentally, one brings the attention into the domain of the mind, and whenever any type of mental event is observed—a thought, an image, a feeling, a desire, and so on—one simply takes note of it, without conceptually classifying it and without trying to suppress or sustain it. Letting the mind remain at ease, one watches all manner of mental events arise and pass of their own accord, without intervention of any kind. Settling awareness in the present, the attention is not allowed to stray in thoughts concerning the past or the future, or to latch onto any object in the present.

Normally when thoughts arise, one conceptually engages with the referents, or intentional objects, of those thoughts, but in this practice one perceptually attends to the thoughts themselves, without judging or evaluating them. The heart of the practice is allowing consciousness to remain in its “natural state,” limpid and vivid, without becoming agitated in fluctuating emotions and habitual thought patterns.

While following this practice, one alternately seeks out the consciousness that is engaging in the meditation and then releases awareness. This is said to be an effective means of dispelling laxity. The First Panchen Lama, writing in the seventeenth century, described this as follows:

Whatever sort of thoughts arise, without suppressing them, recognize where they are moving and where they are moving to; and focus while observing the nature of those thoughts. By so doing, eventually their movement ceases and there is stillness.

The result of this practice is that flawless *śamatha* arises, such that wherever the awareness is placed, it is unwaveringly present, unmoved by adventitious thoughts, and vividly clear, unsullied by laxity, lethargy, or dimness. In this way, too, the sheer clarity and cognizance of consciousness can be recognized.

THE ALLEGED TRAIT EFFECTS OF ACCOMPLISHING ŚAMATHA

In addition to various, valuable state effects of attaining *śamatha*, mentioned earlier, a number of trait effects are also claimed by Buddhist contemplatives. Following such meditation, afflictive mental states such as aggression and craving are said to occur less frequently and to be of briefer duration than previously. Even when destructive mental processes arise, one does not readily succumb to them, and the mind remains calm and composed. Moreover, particularly as a result of settling the mind in its natural state, one experiences a nonconceptual sense that nothing can harm the mind, regardless of whether or not ideation has ceased. In between meditation sessions, when going about normal daily activities, one experiences a heightened sense of attentional vividness; it seems as if even sleep is suffused with exceptional concentration, and dream life takes on special significance. These claims are psychologically and physiologically significant, and they lend themselves to being tested scientifically so that we can understand more precisely what is meant by “attentional vividness” and the other purported shifts in consciousness while sleeping and dreaming.

Claims of extrasensory perception and paranormal abilities are quite common within the Buddhist tradition, in which no theoretical principles refute the possibility of such attainments and numerous methods are taught and practiced to acquire them. Recall the earlier cited statement of the Buddha : “All phenomena are preceded by the mind. When the mind is comprehended, all phenomena are comprehended.” This is followed by an equally provocative assertion: “By bringing the mind under control, all things are brought under control.”²⁴ Modern science has apparently assumed the opposite perspective: when the environment and the body, and specifically the brain, are brought under control, the mind is brought under control. In its pursuit of hedonic well-being, the modern West has sought

techniques to control the environment and maintain fine physical health, and it has produced a stunning array of drugs to control the mind, enabling people to relax, to become mentally aroused and alert, to sleep, to relieve anxiety, to overcome depression, to counteract attentional disorders, to improve the memory, and to experience euphoria, bliss, and even alleged mystical states of consciousness.

While the modern Western approach is remarkably empowering for those who create, market, and distribute the above types of technology and drugs, it is profoundly disempowering for the individual. The Buddhist approach, with its emphasis on eudaimonic well-being, provides little incentive for the rigorous, sustained, extraspective investigation of physical processes and for the development of technology. Given the current, unprecedented encounter of the ancient Buddhist tradition and modern science, there is no reason we should be forced to choose one and exclude the other, although the question of which to emphasize more strongly is a matter of personal inclination.

The ultimate aim of the practice of *śamatha* is not simply to ascertain the primary characteristics of consciousness or to attain exceptional mental powers. Rather, it is to realize the nature of primordial consciousness. For exceptional individuals, the previously described method of settling the mind in its natural state may be sufficient for gaining such realization, but for most people, further training in the practice of the Great Perfection is required.²⁵

PROLEGOMENA TO A FUTURE CONTEMPLATIVE SCIENCE

By the end of the nineteenth century, many physicists were utterly convinced that there were no more great discoveries to be made in their field—their understanding of the physical universe was complete in all important respects. One of the few lingering problems to be solved was known as the “ultraviolet catastrophe,” which had to do with the incompatibility of entropy-energy formulas derived from classical thermodynamics. The solution to this problem came from Max Planck, who thereby laid the foundation for modern quantum theory, which shook the very foundations of physicists’ views of the universe.²⁶

While there is certainly no comparable sense that the cognitive sciences have formulated a comprehensive theory of the brain and mind—far to the contrary!—many experts in this field have concluded beyond a shadow of a doubt that consciousness is produced solely by the brain and that it has no causal efficacy apart from the brain. The fact that modern science has failed to identify the nature of consciousness, its necessary and sufficient causes, and its brain correlates in no way diminishes the certainty of those holding materialist views of the mind. When empirical knowledge of the nature and potentials of consciousness replaces these current metaphysical assumptions, I strongly suspect that the “problem of consciousness” will turn out to have a role in the history of science comparable to that of the ultraviolet catastrophe.

The most effective way to acquire such knowledge, I believe, is by a concerted, collaborative effort on the part of professional cognitive scientists and professional contemplatives, using their combined extraspective and introspective skills to tackle the hard problem of consciousness. This might involve, among other things, conducting longitudinal studies of the gradual development of *śamatha* by people devoting themselves to this training with the same dedication displayed by

the scientists employed in the Genome Project. The successful completion of that effort to understand the genetic code is changing the face of the modern world. The collaborative scientific and contemplative study of *śamatha* may also help to restore a true spirit of empiricism to the study of consciousness and its relation to the world at large.

7.ŚAMATHA: THE CONTEMPLATIVE REFINEMENT OF ATTENTION

This essay was first published under the title “The Buddhist Tradition of Śamatha: Methods for Refining and Examining Consciousness” in *Journal of Consciousness Studies* 6, no. 2–3 (1999): 175–87. For more extensive information, please see B. Alan Wallace, *The Attention Revolution: Unlocking the Power of the Focused Mind* (Boston: Wisdom, 2006).

1 *Ratnameghasūtra*, cited in Śāntideva’s *Śikṣāsamuccaya*, ed. P. D. Vaidya (Darbhanga: Mithila Institute, 1961), 68. This passage is found in the English translation of Śāntideva’s work by Cecil Bendall and W. H. D. Rouse (Delhi: Motilal Banarsidass, 1981), 121. A similar point is made by the Buddha in the opening verse of *The Dhammapada*: “All phenomena are preceded by the mind, issue forth from the mind, and consist of the mind” (*The Dhammapada*, ed. Nikunja Vihari Banerjee [New Delhi: Munshiram Manoharlal, 1989], ch. 1, v. 1).

2 B. Alan Wallace, *Balancing the Mind: A Tibetan Buddhist Approach to Refining Attention* (Ithaca, NY: Snow Lion, 2005), 168. A mental process is said to be *intentional* not because one intends for it to occur, but because it has its own cognized object or objects.

3 Compulsive desire is a mental affliction that by its very nature superimposes a quality of attractiveness upon its object and yearns for it. It distorts the cognition of that object, for attachment exaggerates admirable qualities and screens out disagreeable qualities. Cf. Herbert V. Guenther and Leslie S. Kawamura, *Mind in Buddhist Psychology* (Emeryville: Dharma Publishing, 1975), 96; Geshe Rabten, *The Mind and Its Functions*, trans. Stephen Batchelor (Mt. Pèlerin, Switz.: Tharpa Choeling, 1979), 74–75.

4 Vasubandhu, *Abhidharmakośabhāṣyam*, French trans. Louis de La Vallée Poussin; English trans. Leo M. Pruden (Berkeley: Asian Humanities Press,

1991), 2:474. Cf. Jamgön Kongtrul Lodrö Tayé, *Myriad Worlds: Buddhist Cosmology in Abhidharma, Kālacakra, and Dzog-chen*, trans. and ed. International Translation Committee (Ithaca, NY: Snow Lion, 1995), 168–69.

[5](#) For a detailed account of nonascertaining cognition, see Lati Rinbochay, *Mind in Tibetan Buddhism*, trans. and ed. Elizabeth Napper (Valois: Gabriel/Snow Lion, 1981), 92–110.

[6](#) The technique of focusing on a pebble or stick is found in the section entitled “Instructions on Quiescence with Signs” in *Natural Liberation: Padmasambhava’s Teachings on the Six Bardos*, commentary by Gyaltrul Rinpoche; trans. B. Alan Wallace (Boston: Wisdom, 1998), 95–96. Tsongkhapa opts for focusing on an image of the Buddha in *The Great Treatise on the Stages of the Path to Enlightenment* (Ithaca, NY: Snow Lion, 2002), 3:42–46. For a clear discussion of the technique of focusing on a Buddha image by a contemporary Tibetan contemplative, see Gen Lamrimpa, *Calming the Mind: Tibetan Buddhist Teachings on the Cultivation of Meditative Quiescence*, trans. B. Alan Wallace (Ithaca, NY: Snow Lion, 1995).

[7](#) Cf. Jeffrey Hopkins, *Meditation on Emptiness* (London: Wisdom, 1983), 232–34.

[8](#) Śāntideva, *A Guide to the Bodhisattva Way of Life*, trans. Vesna A. Wallace and B. Alan Wallace (Ithaca, NY: Snow Lion, 1997), V:108.

[9](#) Intelligence is defined as a mental process having the unique function of differentiating specific attributes or faults and merits of objects that are maintained with mindfulness. Cf. Geshe Rabten, *The Mind and Its Functions*, 63.

[10](#) Vasubandhu, *Abhidharmakośabhāṣyam*, 1:206, 272.

[11](#) *Ratnacū ḍasūtra*, cited in Śāntideva, *Śikṣa-samuccaya: A Compendium of Buddhist Doctrine*, ed. P. D. Vaidya (Darbhanga, India: Mithila Institute, 1961), 220–21.

[12](#) Śāntideva, *A Guide to the Bodhisattva Way of Life*, IX:23. Cf. H. H. the Dalai Lama, *Transcendent Wisdom: A Teaching on the Wisdom Section of Shantideva’s Guide to the Bodhisattva Way of Life*, trans., ed., and annot. B. Alan Wallace (Ithaca, NY: Snow Lion, 1994), 26–31.

[13](#) Cf. M. I. Posner, *Chronometric Exploration of Mind* (Hillsdale, NJ: Lawrence Erlbaum Associates, 1978).

[14](#) William James, *The Principles of Psychology* (1890; reprint, New York: Dover, 1950), I:420.

[15](#) This topic is discussed in the section entitled “Identifying the Will and the Means of Stopping Laxity and Excitation” in Wallace, *Balancing the Mind*.

[16](#) James, *The Principles of Psychology*, I:423.

[17](#) William James, *Talks to Teachers: On Psychology; and to Students on Some of Life’s Ideals* (1899; reprint, New York: Norton, 1958), 78.

[18](#) James, *The Principles of Psychology*, I:425.

[19](#) Hopkins, *Meditation on Emptiness*, 233.

[20](#) A clear discussion of this technique is found in the section entitled “The Cultivation of Attention” in Karma Chagmé, *A Spacious Path to Freedom: Practical Instructions on the Union of Mahāmudrā and Atiyoga*, commentary by Gyatrul Rinpoche; trans. B. Alan Wallace (Ithaca, NY: Snow Lion, 1998).

[21](#) Karma Chagmé, *A Spacious Path to Freedom*, 82.

[22](#) H.H. the Dalai Lama and Alexander Berzin, *The Gelug/Kagyü Tradition of Mahamudra* (Ithaca, NY: Snow Lion, 1997), 37–142; Karma Chagmé, *A Spacious Path to Freedom*, 80.

[23](#) This citation is from the “Sems gnas pa’i thabs” section of his *Dge ldan bka’ brgyud rin po che’i bka’ srol phyag rgya chen po’i rtsa ba rgyas par bshad pa yang gsal sgron me* (photocopy in author’s possession).

[24](#) *Ratnameghasūtra*, cited in Śāntideva, *Śikṣāsamuccaya*, 68.

[25](#) For a discussion of such techniques for realizing the primordial nature of awareness, see Karma Chagmé, *A Spacious Path to Freedom*, chs. 4–6, and Padmasambhava, *Natural Liberation*, 114–40.

[26](#) For a fascinating account of this problem and its radical solution, see E. T. Whittaker, *A History of the Theories of Aether and Electricity, Modern Theories 1900–1926* (New York: Philosophical Library, 1954), ch. 3.

8. BEYOND IDOLATRY: THE RENAISSANCE OF A SPIRIT OF EMPIRICISM

[1](#) Francis Bacon, *Novum Organum*, trans. and ed. P. Urbach and J. Gibson (Peru, IL: Open Court, 1994).

[2](#) David Ritz Finkelstein, “Emptiness and Relativity,” in *Buddhism and Science: Breaking New Ground*, ed. B. Alan Wallace (New York: Columbia University Press, 2003), 365–84.

[3](#) Jeffrey Hopkins, *Meditation on Emptiness* (London: Wisdom, 1983), 296–304.

[4](#) René Descartes, *Discourse on the Method; and Meditations on First Philosophy*, ed. David Weissman (New Haven: Yale University Press, 1996), *Meditations* 1, 2, 6.

[5](#) S. B. Klein, “The Cognitive Neuroscience of Knowing One’s Self,” in *The Cognitive Neurosciences III*, ed. M. S. Gazzaniga (Cambridge, MA: MIT Press, 2004), 1077–1090; Owen Flanagan, *The Problem of the Soul: Two Visions of Mind and How to Reconcile Them* (New York: Basic Books, 2002); Charles Taylor, *Sources of the Self: The Making of the Modern Identity* (Cambridge, MA: Harvard University Press, 1989).

[6](#) Steven Collins, *Selfless Persons: Imagery and Thought in Theravāda Buddhism* (London: Cambridge University Press, 1982).

[7](#) Aristotle, *The Metaphysics*, trans. John H. McMahon (Buffalo, NY: Prometheus, 1991), 12.7; 1072b14.

[8](#) *Ibid.*, 12.7; 1073a4.

[9](#) Albert Einstein, “Science and Religion,” in *Out of My Later Years* (New York: Philosophical Library, 1950), 27.

[10](#) Albert Einstein, “On Scientific Truth,” In *Ideas and Opinions* (New York: Crown, 1954), 262.

[11](#) John R. Searle, *The Rediscovery of the Mind* (Cambridge, MA: MIT Press, 1994), 90–91.

[12](#) Daniel M. Wegner, *The Illusion of Conscious Will* (Cambridge, MA: MIT Press, 2003), 341–42.