

Studying “No Mind”: The Future of Orthogonal Approaches

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THIS IS A PAPER ON COGNITIVE SCIENCE and Buddhism. I will comment on the consequences of living in a world increasingly framed by science, and ways in which the situation may change as both cognitive science and the contemporary practice of Buddhism mature and—perhaps—influence each other.

“MY BRAIN IS ANGRY,” AND OTHER CALLS TO ARMS

Many years ago, when I first began studying Buddhism in a serious, formal way, I was visited in Berkeley by a friend, at that time a fledgling biochemist but already a most confirmed *Scientist*. Like characters in an updated version of Fielding’s *Tom Jones*, we were both young and excited, certain we had embarked on vast exploratory journeys . . . but explorations that stood in an unclear relation to one another. Curious (and I think, suspicious) about my new pursuits, he asked me for an account of Buddhism.

I gave him the history—once upon a time there was this person who made extraordinary efforts to see to the heart of the human situation, had a supremely great awakening, shared his insight with the rest of us, and urged us to follow his teaching (*dharma*). My friend listened very patiently, and sat in thoughtful silence when I’d finished. Finally he said: “If I understand you correctly, you’re trying to find something that somebody else already found a long time ago.” I had to admit this was true.

So he went on, “But what *I’m* trying to do is to find things that nobody has ever discovered before!” This time I was the one to fall silent . . . I’d never considered prior to this conversation how complex a difference might lie between scientific and spiritual investigations. His comment opened worlds of worry for me—people might now really think that spirituality was something like a quest for facts, that it was optional or even best handled via the kind of specialization or division of labor that’s common in science. Someone studies astronomy, someone else investi-

gates ethico-spiritual matters, and everyone concentrates on the newest findings and ideas. What a nightmare! Or people might consider spiritual concerns to be more like feelings, the objective then being to have the most satisfying, uplifting feeling (or "experience"), without gaining any new *understanding* about human existence. Or more likely, spirituality might be dismissed altogether.

Can people really ignore the possibility that there is something fundamentally insightful and of overarching importance to us all, in every century, and that it's incumbent upon everyone to address this "something," to see with the aid of its light? Yes, it is more than possible.

At least in my own teaching at the Berkeley Buddhist Monastery (Institute for World Religions) and elsewhere, I thankfully do not encounter indifference to the spiritual side of life. My students are self-selected, and thus, predictably, quite interested in spiritual practice and perspectives. But like all people today, they are deflected by mental whispers from their internalized quasi-scientific critics: "Meditation is pointless, except perhaps as stress reduction . . . You're just a body, the world is simply whatever science finds it to be, there's nothing else . . . 'Mind' is merely a word for the function of the brain, it offers no salvation and enlightenment is—if anything—just an altered state. . . . Compassion is only an evolutionarily adaptive trait, it has no spiritual significance. . . . Stop wasting time on such things, go do something productive!" So my role includes helping people to climb out from their own conceptual traps, practice awakening to what they are, and give full credit to science without misusing it.

But what does it mean to see "what we are," and how else are we to understand it than by the light of science? Yes, this question still remains, and it's a very important one. So I and some colleagues in academia and science formed the Kira Institute, seeking to tackle such questions as rigorously and honestly as we could within present-day knowledge and conceptual schemes. A favorite motto of ours is, starting with science, "What else is true?" I had regularly used this quip in my meditation classes, responding to my students' tendency to think ill of themselves or of the world, to look at the negative side and not appreciate the rest. "What else is true?" But I also found a more technical use for it when these same students tripped over scientific ideas that stood as roadblocks to their practice rather than as theories offering explanatory power and insight in well-defined contexts.

In theoretical terms at least, it was only a short step from my casual response to students' discouragement, to the full-blown Kira project. I hope this project will be passed on to future generations of thinkers concerned with the full spectrum of "knowing" and being human. As of this year (2002), Kira will have held five summer schools for graduate and postdoctoral students from most parts of the world. Our interaction

with these students has been tremendously fulfilling and challenging, but has also frequently reactivated my original worry—the *world is becoming increasingly comfortable with or reconciled to the notion that knowledge and insight are what science gives us, and that nothing else counts as “knowing.”*

We may see the seduction of this scientific perspective not only in people around us, but in ourselves, our coworkers and friends, even in works by people who think they are helping to resist it. For example, my students often take me aside and express difficulties with meditation practice like the following: “I can’t practice because my brain is angry and I don’t know how to get it to leave me alone. Can you give me a technique to make my brain less angry?” Or someone suffers grief due to a death in the family and is reassured by a well-meaning and very sophisticated scientific colleague that grief is “reasonable” because it has been shown that a certain neurotransmitter is affected in such cases. Or someone becomes distressed by personal difficulties or the state of the world, and then takes unconscious refuge in the consolation that the problem is “just a brain state,” or the world is “just atoms” anyway.

Given our culture’s unconscious reconceptualization of the person as a mechanism or a nervous system, it’s not surprising that ethics is now often held to be just a particular set of conventions, aesthetics merely a matter of feelings (in the pejorative sense). Similarly, spirituality and religion are interpreted as beliefs (“creeds”) and nothing more—they may provide the ground for valued feelings or experiences, but not objective understanding or insight, certainly nothing that bears on fundamental questions. Otherwise, religion is stamped into being taken as belief in propositions that are putatively true in the same sense that statements about other “matters of fact” might be, concerning for instance the temperature of boiling water, or the existence of other galaxies, or the force exerted by an impact. These are foolish and fatal concessions to scientism. Ultimately, all such misconstruals of aesthetic and ethico-spiritual matters fail to give us the proper basis even for respecting our status as human beings, with human sensibilities, judgments, and responses.

SCIENCE AND OUR SELF-UNDERSTANDING

The above comments are meant to illustrate a trend that I think is widespread and inevitable. Contemporary scholars in the sociology of science point out that science does not exist in isolation . . . it is not an island, immune to the influences of the cultures that contain it. I would make the converse point—that the influence also spreads in the other direction. There is a pervasive back-propagation from scientific theory and discovery

to culture, technology, all major media and entertainment, our language, our ways of life . . . and hence, to our self-understanding. And it is this understanding that's now at stake.

The phenomenon of conceptual back-propagation figures in the general subject of "science and spirituality," and becomes particularly crucial when the science in question is cognitive science, and when spirituality is represented by Buddhism, a tradition that in its very essence and in all of its language is concerned with knowing, seeing ourselves and our condition as clearly as possible. I am concerned that our self-understanding as human beings, and our insight into the human condition provided by traditions like Buddhism, will continue being replaced by an unconscious and uncritical application of scientific metaphors and analyses. Will the development of cognitive science contribute to this unfortunate trend? Will cognitive science help us appreciate our humanity better, or render the latter notion superfluous?

Of course science should not be held hostage to nonscientific concerns and agendas, certainly not to the perspectives and priorities of spiritual traditions. But the implications of science should also not be overstated, and this is hard to avoid or counter when scientific perspectives are so pervasive and effective in their proper sphere. How can we resist such success? How can we put science in its proper place, particularly if the only models of human cognition which science offers do not describe or even credit features of our explicitly lived status as knowers, ethical agents, and as practitioners of contemplative spirituality? It's difficult for us to hold our ground, to explore and celebrate our humanity directly, when even our (science-influenced) language and concepts cease to frame such an exploration as valuable or intelligible. While not usually seen as science's problem, this is definitely *our* problem, our challenge.

In a recent conversation with a noted physical scientist, I described these misgivings at some length. He replied that this was not a problem because the cognitive sciences were in their infancy, and that in a few hundred years they will reach a maturity comparable to that of present-day physics. In other words, science will sort these problems out . . . eventually. Such a view takes us back to the neighborhood of my friend the biochemist, who thought in terms of a division of labor and couldn't *personally* see a reason to bother with the issues and aspects of life highlighted by an ancient spiritual insight.

I would say instead that *we should not wait for science to tell us who we are—nor believe that it even could, in the ways that matter most.* The full extent of our humanity would not survive such a wait, even for a day, much less for generations. It's not the purpose of science to replace a life lived fully and on its own terms, with a scientific theory, not even a mature theory of human cognition. Our self-understanding can benefit enor-

mously from scientific studies, as from other learned perspectives, but we must still give primary status to a more direct apprehension of and participation in our human nature and human life, the joys, tragedies, and significance of it all.

This is a point Buddhism shares with various ancient and modern strands of Western philosophy, and it is emphasized to an extraordinary degree in the C'han and related contemplative traditions of Buddhism, in the Vajrayāna, and also in yogic teachings. It presupposes a very important role for culture and language, but also an ability and a necessity to engage in and explore our existence directly in a way that is not restricted to our culture's ideologies, norms, language, and conceptual schemes. For Buddhism, these latter—even as offered by Buddhism's own teachings—are only "skillful means," and necessarily vary from place to place, time to time. Ideally, they provide a supportive context for *beginning* an exploration, but do not constitute its fruit. They help raise our explicit awareness of spiritual dimensions and issues that are truly fundamental to our nature, not merely viewpoints or dogma. Since the time of the Buddha, the *primary* emphasis has been on direct discovery and confirmation, not on unquestioning faith in the tradition's founder, scriptures, or community (sangha). This was a very innovative position to take millennia ago, and is slightly reminiscent of the modern scientific methodology based on working hypotheses and testability.

The question for us now, millennia later, is how the Buddhist orientation and that of modern science will coexist. Despite the shared emphasis on investigation and confirmability, science and spiritual traditions like Buddhism are intrinsically *orthogonal*, working in different ways and at right angles to one another. Science depends on abstractly stated theories that can be tested in whole or part by some satisfactory linkage with observed phenomena (observable by the ordinary mind and senses). Buddhism relies on a fully-awake, direct knowing (*vidyā*), rather than ordinary conditional forms of knowing "in terms of" one thing or another. (Buddhism considers the latter type of knowing as really an "unknowing," tainted by a fundamental "ignorance" or heedlessness regarding both our spiritual resources and lapses.) The objects of these two investigations—secular versus soteriological—are also profoundly different.

Must the orthogonality of science and Buddhism necessarily mean they work at *cross purposes*? Or that they'll remain *oblivious* of each other? Neither possibility is very appealing. Could they rather be mutually intelligible and accommodating, despite their orthogonality? Might they maybe even collaborate and thus aid our search for full self-understanding? How? To what extent is this possible, even desirable . . . or impossible, or undesirable? I will consider a few aspects of these questions in the remainder of my paper.

HUMAN NATURE AND NATURE

I think scientists generally grant that physical science is about investigating law-like regularities in nature, and perhaps we could say that psychology and cognitive science will help us understand aspects of human nature and cognition (at least as defined within various theoretical frameworks). Despite the fact that references to nature and “human nature” have a somewhat medieval flavor, and will never figure explicitly in any technical statement of a scientific theory, they still serve well for nontechnical characterizations of the scientific enterprise. However, they are much less central to contemporary *nonscientific* concerns—“nature” now refers primarily to natural resources and their economic value, the politics of national boundaries, perhaps to ecology. People are far more concerned with the media than with nature (even the nature outside their windows).

For very different reasons, the term “nature” was similarly absent during the first eight years of my study of Buddhism, which centered around Indian Buddhist philosophy. Although the Indians were great investigators of astronomy and medicine, Indian culture’s Vedic orientation emphasized the formal, timeless, and transworldly. Mathematics, philosophies of mind, language, epistemology, logic, and soteriologically-oriented metaphysics (fundamental ontology) flourished to a remarkable degree, and this was as true of Indian Buddhist philosophy as of other Indian traditions. But it would be difficult to find an Indian Buddhist text that concentrates on a study of nature, either in terms of the correlative thinking (mythic stories, familiar cycles, etc.) so common among other ancient cultures, or anticipating the modern scientific fashion seeking predictive explanations. And of course the Buddhist interest in enlightenment, by definition a transmundane (*lokottara*) realization in Indian terms, also was a primary factor in the otherworldly cast of much Indian Buddhist teachings.

Moreover, since Indian Buddhist thinkers were elaborating on a no-self, no-thing doctrine, they were eager to separate themselves from Vedic and Hindu orientations that emphasized an ontology of enduring or eternal essences. For Buddhists, epistemology fit the form of the orthodox much more readily than did ontology, which tended to run afoul of accusations of heresy both in India and later in Tibet. One exception was the “buddha-nature” (*buddhatā*), and also in some of the highest teachings, the “nature of mind.” These were considered of crucial importance, made respectable by a vigorous application of the de-ontologizing scrubber called “*śūnyatā*,” no-thingness or openness. (In Mahāyāna Buddhism, *śūnyatā* serves as a protective gate through which no extreme view, metaphysical assumption, or reification may pass.)

Chinese and other Asian Buddhists did not have this indifference to nature, or uneasiness with all intimations of a fundamental ontology. They thought in terms of an ontology based not on “things” and existence claims, but on degrees of appreciating facets of “suchness” (*tathatā*; a major term in both Indian and Asian Buddhist traditions). For their challenge was to preserve what, over several centuries of assimilation, they discovered to be the essential point of Buddhism (the buddha-nature and nature of mind, and hence the possibility of complete awakening to enlightenment), while staying true to cultural insights that emphasized the fundamental status of nature and the human nature’s relationship to nature on various levels. They welcomed the study of the actuality and full dimensionality of our situation and world (nature), which they took to necessarily contextualize all discourse, thought, and spiritual sensibilities as well.

The Chinese therefore defined spirituality in relational terms—the relationship to other human beings (Confucianism), to living nature (Taoism), and finally to the timeless nature of the Buddha. Thus, the Chinese orientation not only put legs under “buddha-nature,” but a whole human body, a society, and even an entire world. They interpreted samsara as disconnection from the world prompted by the small self or selfish self, meditation as a way to become aware of disconnection and to reconnect, to rejoin a defining and edifying context. The emphasis is less on mind and “experience” in the Western sense of an internalist preoccupation or withdrawal, and much more on participation. Here participation in what I’ve called the “full dimensionality of the natural world” was understood to encompass not only an appreciation of body and nature and natural functions, but an appreciation of our full humanity or humane-ness (Chin: *ren*). This explicit articulation counts as a remarkable theoretical leap, and was later echoed and expanded upon in many Asian cultures.

In sum, both Indian and Asian Buddhism acknowledge access to a kind of knowing that is the very basis of buddhahood or enlightenment (the awakening to nirvana). Indian teachings put this in the context of an extraordinarily fine-grained analysis of degenerate cognitions (the very stuff of samsara), plus a detailed philosophy of mind and a sophisticated epistemology. Asian teachings add an explicit account of appreciating (cognizing) and enacting our human nature and its place in Nature, where “Nature” is open-ended and “human nature” refers not only to our organism but our humanity. Nature, “the natural,” then grounds both fundamental human(e) values and an apprehension of these values that is central to our humanity. As a contribution to Buddhism, the latter account afforded more thematic continuity than epistemological studies could between ordinary personal (human) maturation and competency in the world, and eventual awakenings to the bodhisattva’s responsive, compassionate action and even to buddhahood itself.

We modern people and scientists must now decide whether and how all these dimensions of knowing figure in the scientific study of cognition in general, and particularly in scientific representations of quintessentially *human* (i.e., fully appreciative, humane) cognition. The tradition of science is very different from those I have just summarized, but it shares with some of them the orientation towards understanding *in some form* of “naturalist” terms.

THE GREATEST DISCOVERY OF SCIENCE

During its short history to date, science has been remarkably successful in providing informative reconceptualizations of many different domains, many facets of Nature. But I think science’s greatest discovery has been *science itself*, the unearthing of an approach to knowledge that offers unprecedented scope and explanatory power. In part, this involved the discovery of a nature framed in abstract, minimalist terms that expose a universe amenable to rational understanding and even afford tremendous theoretical generality, but that do *not* bear or cater to many aspects of human values, perceptions, or notions of what is significant.

Science has found a way to filter much of the human and humane *out* of nature, literally a fantastic accomplishment that could not have been easily imagined by the ancients. Science’s success in this regard is so great that today we sometimes assume we simply “see” this objective world (including ourselves) everywhere we look, so great that we cannot easily picture any other sort of basic natural order, any other fundamental aspect of our human nature than the physical or the organismic.

My characterization of science’s “great” achievement here may appear deliberately ironic, but I really do mean to praise science—it provides us with a clarity that was hard won, and immensely valuable. It was the movement towards minimalism and abstraction by Copernicus, Newton (who sought the “system of the world”), and others that made modern science possible, and science’s continuing expansion of this view has yielded many advantages. Studying something has come to mean seeing it as a natural phenomenon and working out ways in which it could be fully “naturalized,” explicitly incorporated within a theory of natural processes *without importing any extraneous dimensions*.

Such resistance to introducing extra considerations *without empirically compelling reasons* is considered central to the integrity of the scientific method. But is this kind of “naturalization” too limited? I want to raise the possibility that in the case of scientific forays into the study of human cognition, the answer may be “Yes.” And this may be so either in a way that science itself will acknowledge, or in extra-scientific ways that still matter to a general understanding of cognition. Science’s current

approach to naturalized explanations may be left intact, but we may then have to become more modest, revising our understanding of what science can and can't give us . . . or of what science itself *is and isn't*, in a larger view of things. Or we may come to understand "empirically compelling" in a new way, one that can cogently recognize additional (*humane*) facets of our human nature and our direct experience. Or we may find a use for the latter as essential but preliminary grist for a theoretic mill that produces new theories, but of a fairly conservative type.

There are many possibilities, and I think the task of cognitive science forces them upon our attention to an unprecedented degree. If the greatest discovery of science is science, what will science look like after it has wrestled with the problem of cognition? *And might the "second greatest accomplishment of science not be the discovery of ways of opening up the scientific view*, so it may (theoretically or meta-theoretically) include some of what was removed in the first great framing of science and nature?

Now in stating this possibility, I don't mean to suggest that for cognitive science we must reverse the trend of science's many Copernican revolutions, and go back to some sort of hybrid comparable to that of Tycho Brahe. Brahe retained the ancient "stationary, central Earth" picture, applying Copernicus's heliocentrism only to the other planets, thereby splicing the Copernican theory with the old Ptolemaic system. Certainly the reintroduction of anthropocentrism or folk psychological notions about "mind" aren't wanted or needed for the study of cognition. But it is still very important to recognize more of what a human being *is*, including our spiritual nature and ground. How might this happen?

WHAT THE NEW NATURALIZATION MAY NEED TO INCLUDE

Sometimes naturalization in science is related to an ambitious vision called the Unity of Science program. This sees all branches of science as related, much like the branches of a tree, all connected to one fundamental picture or ontology—that of *physics*. The hope has been that eventually this connection will be explicitly stated in the branches' theories of nature, or at least rendered "sayable" in principle.

At present, such a project is only becoming realizable for chemistry, not yet for other physical sciences, much less for life sciences like biology. But I want to draw the reader's attention to the *idea* behind the Unity of Science program—it's meant to stress that *there are no special sciences*. For if there were a special (anomalous) science then this would suggest that there are phenomena in the universe that are unrelated to all other phenomena. Without continuity in nature, we would be left with an extremely disturbing discontinuity in explanation and understanding.

The "cosmos" (a "well-ordered whole") would be lost, turned irrational. This specter sometimes seems to be what is threatened both by psychological sciences, studying a "mind" that resists reduction to physics, and far more so by traditions like Buddhism, which bolster the view that there is more in our world than is currently dreamt of by science.

But on the level of implementation, actually doing science, the situation is not so restrictive and scientists not so fearful. Leaving spiritual considerations aside, even the most ordinary notion of cognition is going to be tackled by cognitive science in ways that *avoid* entanglement with the Unity of Science program's reductive physical ontology . . . neurology and other brain sciences will certainly compete for center stage here, but not physics. Many psychologists do believe "everything is ultimately physics," but they usually still concede that this metaphysical faith affords no traction in making theories of cognition, and they see little prospect for any theoretical linkage between psychology and physics. (Here I'm ignoring the many popular-level discussions about alleged connections between quantum mechanics and consciousness.) As the scientist Michael Polanyi put even the most optimistic case, which assumes we *can* work from physics up to the highest levels, "lower levels do not lack a bearing on higher levels; they define the conditions of their success and account for their failures, but they cannot account for their success, for they cannot even define it."¹

So naturalization in cognitive science is in practice fairly free, and will necessarily take new forms, compared to its history in physical science. Two main types are easily distinguished: bottom up (primitives leading to cognition, if organized in the right way), and top down (conceptions of what cognition is). The "bottom" will also be understood in many new ways, partly owing to cognitive science's unusually interdisciplinary character—the perspectives of psychology, biology, linguistics, mathematics, computer science, artificial intelligence research, various neurosciences, and philosophy may all figure, with each contributing its own sense of "ground" . . . interpretations of evolutionary theory and specifically of perception in an evolutionary context, epistemology and philosophy of mind, theories of computational complexity, normative concepts, and phenomenology will all be applied in efforts to render "cognition" less opaque. They may be used to frame new definitions as well as approaches, "tops" as well as "bottoms."

Spiritual perspectives of human "being" and cognition also suggest relevant bottoms and tops. For Buddhism, the bottom is samsara (cycling around endlessly in a less-than-optimal way of being). Specifically, it's a certain kind of cognition that's co-dependent with existentially compromised stances centering around identification with a circumstantially-defined "self," with attendant selfishness and suffering. The top is then our

buddha nature, the authentic being from which we so commonly and blindly stray.

Of course neither of these is a *theory*, and I'm no longer using "bottom" and "top" to refer to building or defining cognition. But acquaintance with these "spiritual" issues certainly suggests systematic descriptions, hence Buddhist "philosophy," plus celebratory tantric texts, poetic articulations of enlightenment, and sacred art, all of which can—with the right preparation—make an intelligible point. Familiarity with such fundamental facets of human existence may even help us make more insightful scientific theories of cognition.

At this point I admit to taking the side of a C'han teacher, a position which considers it impossible to fully understand what "mind" and "cognition" are unless they're seen in their complete context, as excerpts from the "nature of mind" that's central to Buddhist contemplative traditions. So the C'han tradition views them as degenerate cases, collapsed or compromised forms of a cognizance (*vidyā*) that is intrinsically pure, directly encompassing, veridical, and spiritually relevant. This is the ultimate form of a "top-down" understanding (not a theory) of all cognition. If appreciated even slightly, it would help us conceive of very new meanings for "a being," "life," "world" (as context for perception), "body" (as basis of perception), and "act of perception."

This subject has also been given a very profound treatment by the Vajrayāna tantras, which like C'han, do not theorize but *show* the existential character of such facets of being. For the advanced Vajrayāna practitioner, the embodiment of authentic being arises within and as the freedom of empty/fullness (not the consequence of prior actions and lower-level processes), and stands in potent, satisfied, and self-certain significance at the very center of an always-original, harmonious realm (*dhātu*) or sphere which reveals the multifaceted fullness of that being (everything is gathered to it in no-time), and also demonstrates that being's nature as everywhere manifest in the encompassing "surround" (everything in this *maṇḍala* expresses it).

Such perfection is what ordinary samsaric mind has blurred past in ordinary time, and the dynamic features of this inauthentic way of being (blur) can be studied quite precisely. Moreover, our pure, always-original mind is what ordinary mind keeps borrowing from, in its compulsive grasping to set up independent existence as an agent and owner (and bearer of the burden of unwanted consequences, a self passing through myriad confusing physical environments of challenge, deficit, and conflict, all of which naturally accrue to that un-knowing stance). In samsara, "cognition" becomes dedicated to narrowly-defined organismic needs and preoccupations, where neither the latter nor their embodied presuppositions can themselves be seen with much clarity or objectivity.

Vajrayāna literature and practice offer many-sided treatments of hundreds, perhaps thousands, of such correspondences between features of our spiritual nature (plus appreciative cognitions of a contextualizing “pure realm”), and aspects of our ordinary existence. The latter includes our bodies, physical and emotional needs, sense perception, and co-dependent ways of knowing. These high-low correspondences may seem suspiciously formulaic and even arbitrary to modern scholars, because the Vajrayāna “code” can only be cracked by engaged practice, by a direct apprehension that is itself of the nature of the “deity” being “practiced” (Tib: *yidam*). (It cannot be fully built up from below via a collection of concepts or “meanings.”) But once this insight becomes accessible to more *people* (who are also scientists), at least some small part of the implications may jump the boundaries that have so far separated science and spirituality.

COSMOS REGAINED

As I’ve already granted, we mustn’t try to force science to accept any perspective—the latter should be recommended by scientifically-compelling considerations. But what will those be? We should remember that at this point in time, even the most conservative approach to defining aspects of cognition may have to stretch, to appeal to much higher-level concepts than have been required in the physical sciences. Perhaps for some influential theorists, even insights drawn from contemplative spirituality will help shape those concepts.

Since the most rudimentary type of cognition is still presently a mystery to science, it might seem very premature to discuss appealing to or attempting to scientifically represent insights from spiritual traditions concerning much loftier forms of cognition. Perhaps . . . or perhaps that is precisely what’s needed to make a sound beginning, even for simple cases . . . or to renovate the field’s theoretical framework later in its development, generations from now. The only way we’ll ever really know is to leave science alone and let it determine what it will accept as a useful point of departure. But this still allows room for contributions from Buddhism and other spiritual traditions. The reason (as I just suggested) lies in what it means to “leave science alone.”

Early in this paper I mentioned that science is not an island, and I worried about the potentially diminishing or flattening influence of conceptual back-propagation from science to life, to our self-understanding. Commensurate with this worry, *I draw comfort from the fact that this influence also moves in the other direction, forward from people to our explanatory systems.* Modern people will certainly come to have an advanced grounding in Buddhist practice and realization, and they will go on

to shape culture as well as being shaped by it, by changing language or writing novels or doing science, or philosophy, or art. Will such people and others sharing their culture forever compartmentalize and insulate their thinking about cognitive science, continuing to channel it along standard lines, when their view of cognition (and the world being cognized) has been significantly enlarged and deepened, in some cases by actual contemplation of the fundamental “nature of mind”?

I think such conceptual insulation is impossible. People (scientists too) simply don’t work that way, and the field itself mandates a new theoretical openness and a departure from using physicalist reductionism as the only source of explanations.

The harmony of Cosmos may therefore be retrievable, but in a “messy” way not anticipated in the heyday of the old physicalist and positivist programs. First, for the next century or so, scientific theory may have to live with a nondisruptive stratification between physical and psychological sciences. The latter are “special” after all, on the level of explanation, if not on the level of basic ontology. Second, even while science remains unchallenged as the authoritative way to answer certain sorts of questions, it will no longer maintain either the myth of apparent immunity to outside influences, or its dominance in the territories of “knowing” and “understanding.” For from this time on, a profound and creative tension may explicitly exist *forever* between two orthogonal kinds of understanding—abstract statements of scientific theory, and directly perceived and lived views afforded by mature, practiced insight.

A SUMMARY OF POSSIBLE BUDDHIST CONTRIBUTIONS TO COGNITIVE SCIENCE

One of the most important and difficult challenges to undertaking a scientific study of cognition concerns the basic view—what sort of thing *is* cognition? Regarding the related faculty known as “perception,” psychology has undergone a revolution in determining, within the past forty years, that the right way to reframe this question is “What is perception’s *job*?” And that in turn has been seen to involve the question “What is perception’s real *context*?”

Here I’m referring obliquely to the ideas of J. J. Gibson, the specifics of whose late work in ecological psychology are still hotly contested, but who indisputably (even according to his critics, like the neurophysiologist and artificial intelligence theorist David Marr) made enormous contributions to the “top level,” *framing the problem*. After Gibson, it has been impossible to overlook the importance of answering “top-” or “view-” level questions by appeal to the ecological and evolutionary context of percep-

tion—the actual environment of the organism and the active, mutually-defining relationships between environment and organism that add up to a life.

Before Gibson made this clarification, the psychology of perception was framed in more abstracted, laboratory-based approaches motivated by traditional optics, which made the problem easier to formalize and study, but had the defect of not always being very insightful, not very reflective of the real high-level issues that needed to be addressed. After Gibson, the challenge for theorists of all stripes has been to find ways to be true to these latter issues, while retaining scientific rigor, formal definition and analysis, and the study of perception's implementation mechanisms and relation to other faculties (providing continuity with other sciences). At first, introducing perspicuous top-level definitions of what a given phenomenon really *is*, often seems to just make trouble—things get much harder to frame and study—but in the long run experimentalists do find clever ways to use the new handle on things and move forward with their work. I believe something of this sort may happen in the case of cognition, and may even enable very high-level and seemingly “nonscientific” views of cognition, like those arising from Buddhist practice, to be *at least scientifically suggestive* and thus to contribute someday to new scientific “view” formulations.

More specifically, science may come to understand us “sentient beings” better by revisiting the sharply debated issue of the degree to which we are and aren't directly and intimately connected to our environment—the idea that it and we are mutually, co-dependently defined. (The popular translation, “sentient being,” is misleading—the word [as in Tib: *semschan*] really means “samsaric mind”-bearing beings.) Biological theory is already moving in this direction. Eventually judgment will be passed on Gibson's specific notion that perception involves direct perceptual access to features of the environment. His claim was that we can “pick up” these features through vigorous exploratory interaction, rather than having only indirect, mediated access and thus necessarily needing to “reconstruct” or represent them through processing informationally-impoverished sensory data that could be interpreted in many different ways. Gibson's ideas have been heavily used by visual media and research into virtual reality technology (a fact that would have given Gibson no satisfaction), but have not yet been successfully integrated into large areas of psychology.

Whatever is decided about the scientific value of Gibson's particular way of framing the idea of “direct perception,” the more basic issue of our connection to and disconnection from our context and source seems important for many aspects of both spiritual and scientific renderings of cognition. Below, I hesitantly offer a *very speculative* summary of related spiritual points and their possible “suggestiveness” for cognitive science.

1. *the ground of mind*: Some Mahāyāna Buddhist sutras, the C’han / Zen tradition, and higher levels of Vajrayāna all emphasize that the “top-level” ground and real nature of mind is a timeless, originary purity. I see no way this level of realization could be represented in a scientific theory in the near future, but I definitely think it would inform the scientist herself, in her understanding of what science does and doesn’t give us. So here “understanding” splits between that yielded by science and that vigorously held by the human being *whether science can credit it or not*.

2. *the job of cognition*: Cognition is relational, linking us to our defining context and thereby preserving some degree of appreciation of our own significance.

3. *the character of cognition in the mature human being*: Following from the previous point, the central organizing theme of cognition is the appreciation of our own worth as human or humane, and the connection to our fellow human beings as a shared commitment to upholding this significance.

4. *the full range of cognition’s substance and function*: This is seen in the Vajrayāna practice I mentioned, where the connection is represented as a center / periphery without distance or loss of the essential character (acknowledging satisfaction and celebration).

5. *the principle of its operation*: The *maṇḍala* level of cognition is made possible by a higher kind of time that enfolds everything and does not obscure the link back to the center.

6. *degenerate cases*: Each of the above admits of down-shifted versions where the essential point of connection and preservation of significance is retained only negligibly, hence apparently not at all (like collapsed dimensions that appear to have zero extent). We are left with only intransigent “facts,” distinct circumstances and compelling needs that do not admit of complete satisfaction in the circumstantial domain.

What is at issue in all these suggestions is a larger sense of the context or ecosystem of cognition that preserves the spiritual aspects of our nature, and the further notion that ordinary cognition is an excerpt that exists co-dependently with other limited representations of that original context. Direct access and satisfying intimacy become distance, effort, and frustration in a landscape where fundamental significance seems fictional (it can

only be constructed, somewhat arbitrarily). Mind and connection to the world appear to be emergent and computed, respectively, not fundamental and direct. The latter level certainly can be studied by science. But perhaps it should not be understood or studied in such isolation, as a closed system.

The main objection to even considering a high-level theory of cognition prompted by the above considerations is the concern about contamination from *folk psychology*—ordinary ideas about mind drawn from convention or introspection. I cannot treat this concern at length in the present paper, but I'll note that Indian and Tibetan Buddhist philosophical analyses were motivated by this same worry, and sought to root out every vestige of such ordinary (false) notions. Moreover, Buddhist practice and the realization of an appreciative capacity quite beyond the ordinary mind may protect against even subtle forms of folk psychology to which scientific theorists themselves are still oblivious.

A TRANSFORMED LANDSCAPE OF "UNDERSTANDING"

I have attempted to describe a new situation in human history, in which two types of understanding coexist. And I have speculated that each may bear on the other, and in particular that the one based on direct insight may influence or even redefine the other (science). This trend of re-dimensioning science in humane and spiritual terms may be inevitable . . . but not in a straightforward sense that can ever be considered final.

Assume for the sake of argument that fairly standard science soon becomes capable of producing a "good" theory for cognition—one that fits the central data we can formalize and test for—even if some of our questions and intuitions about cognition are left woefully unaddressed, even if the theory's larger implications regarding our status as knowers remain uncertain. (It's really not science's job to be totally responsive to all of our questions.) Such a neat theoretical resolution to the "cognition" puzzle would not be the last word, simply because science will no longer be our sole way of understanding. On the other hand, standard science's claim to perspectival supremacy will never be definitively overthrown either.

Scenario One: science produces a model of cognition that is conservative, consistent with more basic physical science or psychological science, and that is not indebted to any spiritual insight or perspective.

Scenario Two: science becomes less conservative, more influenced by spiritual insights, and produces a new kind of theory of cognition, judged by new rules of adequacy.

In the first case, spiritual insights will *still* be loose in the population, and will eventually prompt scientific ideas that contend with the theory of cognition, opening it up or reframing it. In the second case, a (relatively) more purist or narrow sense of science will *still* remain an option, and may at any point suggest a theory of cognition that's free of the "extraneous factors" introduced by contemplative insight. *No final winner can ever emerge in this new, complex landscape of competing types of understanding*, although conservative science will have an edge over less tried-and-true reformulations of science . . . an edge that will be gradually eroded by further reformulations, and also by influence from perspectives afforded by spiritual insights into an extended sense of ecology.

This competition will also play out on a more basic level, as I said earlier, where the issue is our understanding of what *science itself* is and isn't—of its status in a larger scheme suggested by spiritual experience, versus our understanding of *the status of spirituality* in a broad explanatory scheme proposed by an ever-evolving science. Here too, no final winner can emerge, even though spiritual perspectives may have an edge for the people who actually enjoy them in an advanced form. To explain this last comment, we might look at another way of comparing the scope of scientific and spiritual perspectives—*containment relations*.

Which contains which? My Buddhist teachers were all convinced that the nature and expanse discovered by traditions like Buddhism *contains* the realm of phenomena studied by science. The latter realm is seen as part of what is given co-dependently with the five senses and related type of ordinary, samsaric mind. On the other side, scientists studying brain scans of religious contemplatives are starting to argue that spiritual experience ("God," etc.) may be understood (and explained away?) in neurological terms, perhaps even evolutionary terms.

It is this new complex environment of orthogonal types of understanding that I believe will contextualize us and our self-understanding from now on. So to summarize the complex, many-sided relationship involved here: First, science and spirituality (taken as a way of knowing) do *talk* to each other, indirectly by sharing a culture. Second, they cannot *refute* each other. And despite the latter, third—they are not *immune* to each other's critiques.

To elaborate—first, it is not the two "non-overlapping magisteria" picture (NOM[A]) defined by Stephen J. Gould in his book *Rock of Ages*, where science and religion peacefully (obliviously) coexist without any mutual interchange or influence. This view was strenuously recommended by the Swiss theologian Karl Barth, whose neo-orthodox compromise

“protected” religious thought by separating it so radically from the domain of science that it has now become almost incoherent, i.e., it leaves religion and spirituality with no apparent connection to the world (“God” is “wholly other”). I suggest that this view gives away far too much.

Second, it does not suggest science could refute core Buddhist *insights* (for example), because by their orthogonality I do mean to imply they really are different kinds of enterprises, with different “rules” and dimensions or domains of application, even different ontologies in some refined sense of the term. Of course, if an overzealous Buddhist from the nineteenth century CE had tried to bolster the dharma’s position by proclaiming that Mount Meru must constitute the center of the physical universe discovered by astronomers, then he would have mistakenly recast Buddhism as a proto-science, confusing a spiritual pointer with an empirically-testable claim about physical phenomena (a claim that happens to be false). I think it’s clear the central insights of Buddhism are not claims of this sort, and cannot be refuted in this way.

Finally, I do not mean to say that Buddhist tenets (statable positions and philosophical analyses) are unfalsifiable or unchallengeable. On the contrary: any tenet that can meaningfully be framed as a testable proposition can be falsified, and so even beyond inappropriate reifications of Buddhist themes (like the Mount Meru example above), there are doubtless many features of Buddhist theory, especially when interpreted in modern Western psychological ways, that may arguably be falsified by science or critiqued by modern philosophy. So be it. Orthogonality does not protect Buddhism in *this* way.

Buddhist theories of mind and perception are traditionally understood as literally debatable elaborations, and as ornamentations of the directly encountered “core insights” that are not entirely reducible to a tenet, or sect, etc. We do not construct such insights or hold them in our ordinary mind, but trim down to their givenness (*tathatā*, suchness). If science or philosophy could critique a Buddhist theory (tenet, position), this critique would simply help the spiritual enterprise along, on the level of articulation. In the same fashion, a specific psychological (scientific) account of mind might be very effectively branded as obtuse by an advanced practitioner of contemplation—if she also happens to be a respected scientist, and if the time is right to frame the critique cogently in scientific terms!

CONCLUSION

Earlier I decried the trend towards interpreting scientific *study* as synonymous with *reducing* us and our world to scientific terms. I also mentioned that there are more things in our world than are currently dreamt of by science. The latter claim does not mean that there are esoteric

or peculiarly “spiritual” *phenomena* in the world that are not covered by science . . . rather, my point was that *everything in life is this “more.”* Framing spirituality as being about explicitly statable but novel phenomena (happenings, qualities, etc.) is again buying into an inappropriate form of reductionism.

Rather than rejecting or hiding from science, we should embrace and respect it as offering a major path to understanding. And we should learn to exercise our humanity and status as spiritual beings, for that will give us access to another, vital way of knowing. This means *throwing open the boundaries to inquiry in both directions*. Let science study everything (that it can find an approach to studying), including spiritual experience. Let spiritual insight regarding our participation in a larger, more fully-dimensioned context, bear on everything . . . including science.

In this way, the development of cognitive science, and the assimilation and clarification of the essential points of Buddhism by our culture, may over time become mutually-informed—and even mutually-inspired—enterprises. Perhaps we will thus realize a previously unattainable, integrated vision of the very rich world that we are in, and that we *are*.

NOTE

1. Michael Polanyi, *Personal Knowledge: Towards a Post-Critical Philosophy* (Chicago: University of Chicago Press, 1958).